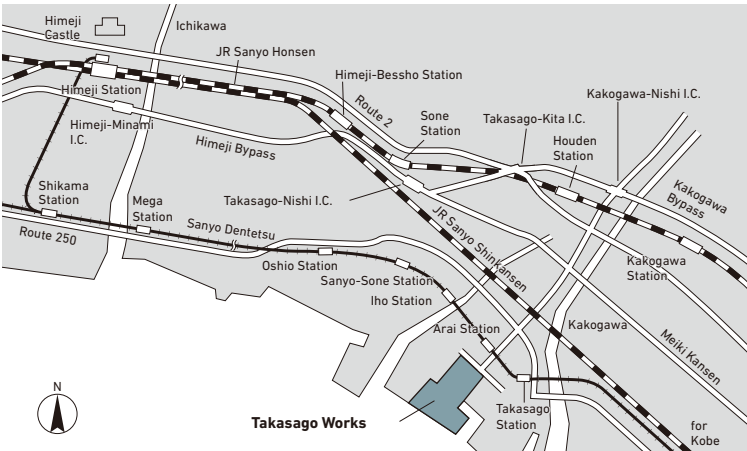




#### Brief History

- 1962** Shin Mitsubishi Heavy Industries' Kobe Shipyard & Machinery Works started operations for exclusive turbine production.
- 1963** Produced the plant's first gas turbine.
- 1964** The Works was split off from Kobe Shipyard & Machinery Works to become the Takasago Machinery Works.
- 1969** Manufactured the works' first set of nuclear turbines.
- 1984** Built a gas turbine combined cycle power plant in the Higashi Niigata Thermal Power Plant of Tohoku Electric Power Co., Inc.
- 1986** Developed the 1,250°C class gas turbine (MF-111).
- 1992** Launched verification test of 1,350°C class M701F.
- 1997** Built a gas turbine combined cycle power plant for verification testing. Began demonstrating the operation of a 1,500°C class gas turbine (M501G).
- 1999** Launched full load verification test of the world's first steam cooled gas turbine (M501H).
- 2001** Mitsubishi Power Systems America, Inc. ("MPSA") was established in the United States.
- 2004** Began commercial operation of the 300 MW M701F BFG firing combined cycle plant at the Kimitsu Cooperative Thermal Power Plant.
- 2005** Mitsubishi Heavy Industries Dongfang Gas Turbine (Guangzhou) Co., Ltd. was established in China.
- 2007** Achieved commercial operation of the M701DA air blown integrated coal gasification combined cycle plant at the Nakoso Thermal Power Plant. Began commercial operation of the M701G2 gas turbine combined cycle power plant at the Kawasaki Thermal Power Plant of Tokyo Electric Power Co., Inc.
- 2008** Established the Technical Skill Education Center at the Takasago Machinery Works.
- 2009** Developed a turbine inlet temperature 1,600°C class J-series gas turbine and progressed to commercialization.
- 2011** Shipped its 500th gas turbine. MPSA built the Savannah Machinery Works, a U.S. facility that manufactures gas turbines, turbine components, and services and repairs gas and steam turbines.
- 2014** EGAT Diamond Service Co., Ltd. built a gas turbine high temperature parts repair plant in Thailand. Mitsubishi Hitachi Power Systems, Ltd., a joint venture company formed by Mitsubishi Heavy Industries and Hitachi integrating thermal power generation systems and other related businesses, established. Mitsubishi Hitachi Power Systems' Takasago Works was formed as a result.
- 2020** Commissioned and started commercial operations of T-Point 2 combined cycle power plant validation facility. Launched validation of M501JAC gas turbine with turbine inlet temperature of 1,650°C. Established Mitsubishi Power, Ltd. Mitsubishi Power's Takasago Works was formed as a result.



#### Access

**Takasago Works**  
2-1-1 Shinham, Arai-cho, Takasago-shi, Hyogo 676-8686, Japan Phone: +81-79-445-6125

##### ■ From the Airport

From the Airport to Kobe Sannomiya

<From Kansai International Airport>  
It takes 65 minutes by limousine bus bound for Kobe Sannomiya

<From (Osaka) Itami Airport>  
It takes 40 minutes by limousine bus bound for Kobe Sannomiya

<From Kobe Airport>  
Take the Port Liner from Kobe Airport Station to Sannomiya Station (about 18 minutes). From Kobe Sannomiya to the nearest station

Sannomiya Station (JR) → Akashi Station (JR) → Sanyo Akashi Station (Sanyo Electric Railway) → Get off at Takasago Station or Arai Station (Sanyo Electric Railway) (About 50 minutes in total)

##### ■ By Train

<By Sanyo Electric Railway and taxi>  
Get off at Takasago Station and take a taxi for about 5 minutes to reach the front gate.  
<By Sanyo Electric Railway and on foot>  
Get off at Arai Station and walk for about 5 minutes to reach the front gate.

<By JR and taxi>  
· Get off at Himeji Station (Shinkansen side) and take a taxi for about 30 minutes to reach the front gate.  
· Get off at Kakogawa Station and take a taxi for about 20 minutes to reach the front gate.

##### ■ By Car

From Kakogawa Bypass Kakogawa Nishi Interchange; it takes about 20 minutes to reach the front gate.

# TAKASAGO WORKS



## TAKASAGO SINCE 1962

### Takasago works aims for decarbonized society through advanced technology

Takasago Works was originally set up in 1962 to serve as a turbine manufacturing plant for large capacity power plants and machinery. Today, Takasago Works manufactures a variety of solutions, including high performance gas turbines, steam turbines, and other related products. Its J-Series gas turbine is the most heat efficient gas turbine available on the market. These and other products have contributed to the advancement of both industry and daily life around the world.

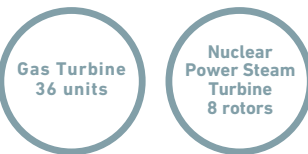
#### Area

1,056,014 m<sup>2</sup>(Site) 336,419 m<sup>2</sup>(Building)

#### International Certifications

- ISO 9001 Quality Management System
- ISO 14001 Environmental Management System

#### Annual Production Capacity



Mitsubishi Power, Ltd.

power.mhi.com

MP43-04CC03E1-A-0, (3.0)20-9, ZTP



# TAKASAGO WORKS

## Main Products



M501 JAC Gas Turbine Rotor



Nuclear Power Steam Turbine



Gas Turbine Power Generation Equipment



Nuclear Power Turbine Generation Equipment



Gas Turbine Combined Cycle (GTCC) Power Plant



Nuclear Power Plant

## Outline



- |  |   |
|--|---|
| 1 Main Office                                    | 16 Combustor Shop (Fuel Nozzle & Basket)                          |
| 2 Office No.2                                    | 17 Welding Shop   |
| 3 Office No.3                                    | 18 Heat Exchangers Machining Shop                                 |
| 4 Office No.4                                    | 19 Large Machining Shop   |
| 5 Office No.5 (Design & Service Building)        | 20 Assembly Shop  |
| 6 Control System Design and Manufacturing Center | 21 Turbine Rotor Shop   |
| 7 Technical Skill Education Center               | 22 Combustor shop (Transition Piece)                              |
| 8 Small Blade Forging Shop                       | 23 Hot Parts Repair Shop  |
| 9 Large Blade Forging Shop                       | 24 Gas Turbine Assembly Shop                                      |
| 10 First Blade Shop (Compressor Blade)           | 25 Steam Turbine Load Testing Facility                            |
| 11 Second Blade Shop (Gas Turbine Blade)         | 26 Gas Turbine Component Testing Facility                         |
| 12 Third Blade Shop (Gas Turbine Blade)          | 27 Combined Cycle Power Plant for Validation (T-Point 2)          |
| 13 Fourth Blade Shop (Gas Turbine Blade)         | 28 Dedicated Wharf  |
| 14 Fifth Blade Shop (Gas Turbine Blade)          | 29 Pump Production Shop (Mitsubishi Heavy Industries, Ltd.)       |
| 15 Piping Shop                                   | 30 Mitsubishi Heavy Industries, Ltd. Research & Innovation Center |

## Combined Cycle Power Plant for Validation

The Mitsubishi Power protocol for long-term product validation was pioneered in the original T-Point at Takasago Works in 1997. The game-changing process has greatly improved gas turbine performance and reliability, ultimately helping ensure customer satisfaction.

However, in recent years, there has been rising demand for cleaner and more efficient power generation facilities. To address these emergent needs, Mitsubishi Power constructed T-Point 2, a new validation facility on the site of the previous T-Point.

T-Point 2 – with its gas turbine with an inlet temperature of 1,650°C – will contribute to the stable supply of power while promoting energy decarbonization.



## Initiatives for a carbon-free society

A large hydrogen gas turbine able to undertake hydrogen co-firing in combined cycle is currently being developed by Mitsubishi Power at Takasago Works.

When used as fuel, hydrogen does not emit CO<sub>2</sub>, significantly reducing carbon emissions of thermal power generation. Hydrogen technology therefore has great potential to decarbonize power systems at a global scale.

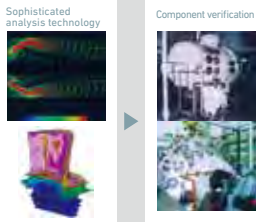


## Strengths of Takasago Works

Mitsubishi Power's Takasago Works conducts R&D, design, manufacturing, and validation of power solutions and technologies. Our production systems aim to ensure high quality and reliability and are driven by the latest technological advancements. Our products incorporate state-of-the-art technology, are manufactured with materials of the highest quality, and are validated via the world's largest turbine testing facility. In addition, we have a Remote Monitoring System which runs 24 hours a day to ensure optimal operations of plants around the world.

**R&D**  
Technical development that makes full use of today's most advanced technology

- Development of the latest design/analysis tools
- New product development



**Design**  
The latest technology is applied to design

- Design based on our own design techniques



**Validation**  
Total validation before actual machine application

- A pilot plant for one of the world's largest turbines
- Establishment of a combined cycle power plant at Takasago Works to implement rigorous prototype validation.



**Manufacturing**  
Manufacturing of high quality products

- Manufacturing of major products (blades, rotors, casings) in-house



## Remote Monitoring Center

- Monitoring of the operational status of plants around the world 24 hours a day
- Predictive detection and performance degradation diagnosis through real-time operational data analysis
- Breakdown prevention and maximization of operability rate

