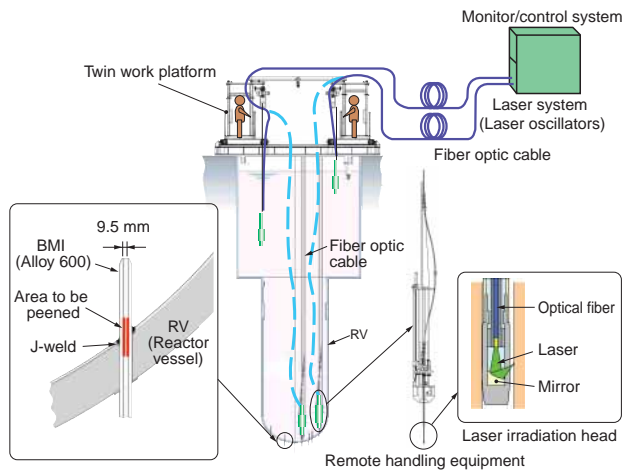


In the field of social infrastructure, which is the mainstay that keeps the lifelines for a secure and safe society running, Toshiba is focusing on developing technologies for power generation systems, such as next-generation nuclear power plants, high-efficiency steam turbines, renewal and modernization of existing power plants, including transmission and distribution systems. We also offer solutions for core social infrastructures such as water supply and sewerage systems, road monitoring systems, airport control systems, railroad systems and so on.

Laser Based Maintenance Technology for PWR Power Plants



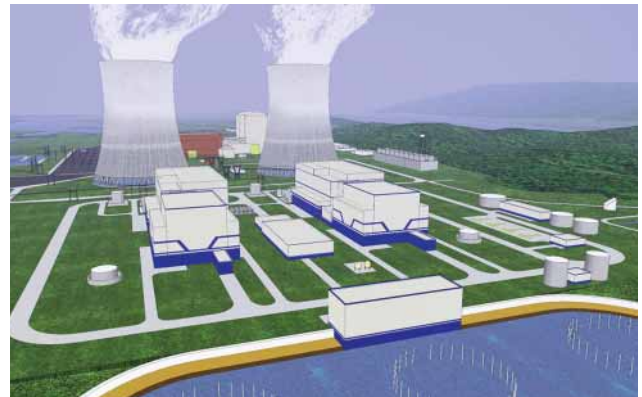
Laser maintenance system concept for BMIs

Stress corrosion cracking (SCC) is one of the major phenomena degrading the reliability of aged reactor components. In order to avoid SCC, Toshiba has developed laser-based maintenance technologies, which have been successfully applied in operating BWR (Boiling Water Reactor) plants. These technologies have been extended for use on the inner surface of bottom-mounted instrumentation (BMI) nozzles of PWR (Pressurized Water Reactor) plants.

This YAG (Yttrium Aluminum Garnet) laser system includes both nondestructive testing (NDT) and preventive maintenance for SCC. As for NDT, we have adopted laser ultrasonic testing (LUT), which has great potential for the remote inspection of reactor components. LUT is efficient for the depth measurement of surface-breaking cracks. As a preventive maintenance measure, laser peening (LP) has been adopted. LP is effective in improving residual stress from tensile to compressive stress by irradiation with focused high-power laser pulses in water.

The first application in a PWR was started at Ikata unit-1 of Shikoku Electric Power Company Inc. and BMI inner surface treatment was successfully completed. As shown in the figure, the laser maintenance system is composed of laser oscillators, a beam delivery system with fiber optics, remote handling equipment with a laser irradiation head for LP and a monitor/control system. This laser maintenance system is located on the operation floor. The devices for LUT and LP are suspended under the work platform and set at the top of the BMI. This system was also applied to the reactor vessel (RV) nozzles by installing another remote device. The treatment of weld lines on inlet nozzles and core flood lines of the reactor vessel was completed.

Overseas Development of Advanced Boiling Water Reactor (ABWR)



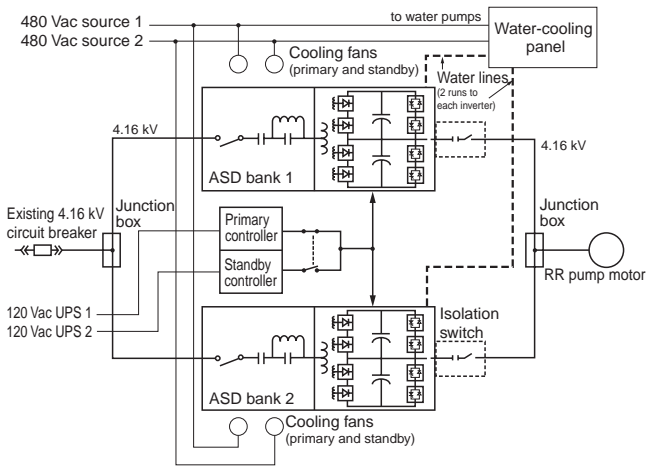
Draft of ABWR construction plan for the TVA Bellefonte site, U.S.A.

Toshiba is working with the Tennessee Valley Authority (TVA) Bellefonte site, one of the largest U.S. utilities, on the feasibility of the construction of an advanced boiling water reactor (ABWR) at TVA's site in Bellefonte, Alabama, with the support of funds from DOE (Department of Energy).

The ABWR is the most advanced design of nuclear power plant, with a proven construction record in Japan. The ABWR design is already certified in the U.S.

Under the national energy policy (NEP), adopted by President Bush in May 2001, there is a higher level of expectation for new nuclear power plant construction orders. There has not been a new order for more than 20 years. Taking this market opportunity, Toshiba is aggressively pursuing the deployment of the ABWR in the U.S. market.

Expansion of ASD Business in the U.S. Nuclear Market



UPS: Uninterruptible Power Supply system
 Vac : Alternating Current Voltage
 RR : Reactor Recirculation

Toshiba ASD circuit configuration

Toshiba has been awarded business commitment from Exelon Nuclear, the largest nuclear generation company in the U.S.A., to supply 12 sets of adjustable speed drives (ASDs) for the reactor recirculation system (RRS) pump motor power for 6 plants in collaboration with GE Nuclear. Toshiba and GE have promoted ASDs for adoption in U.S. utilities, and Exelon Nuclear has evaluated our team promotion very highly. Toshiba will take charge of supplying ASDs and their system/application engineering based on the proven retrofitting technologies of ASDs in Japan, and GE Nuclear will take charge of licensing and architectural engineering based on their U.S. O&M experiences. In U.S. utilities, many motor generator (MG) sets or flow control valves (FCV) have been in operation for more than 25 years and are reaching their retrofit time. Adoption of ASDs will provide not only renewal of the equipment but realization of higher plant efficiency by reducing house load and higher reliability through the redundant systems in comparison with existing MG sets and FCV. To meet the utility's high demand for plant reliability, Toshiba adopts redundancy design in both the power section and the control section, and provides on-line maintenance function during plant operation. Also in the inverter section, Toshiba adopts the insulated gate bipolar transistor (IGBT), which has been used in the industry with the utmost reliability.

Toshiba aims to expand the ASD-retrofit business in both the U.S. and Japanese market.

Commencement of Maritsa East-2 Thermal Power Plant Rehabilitation Project

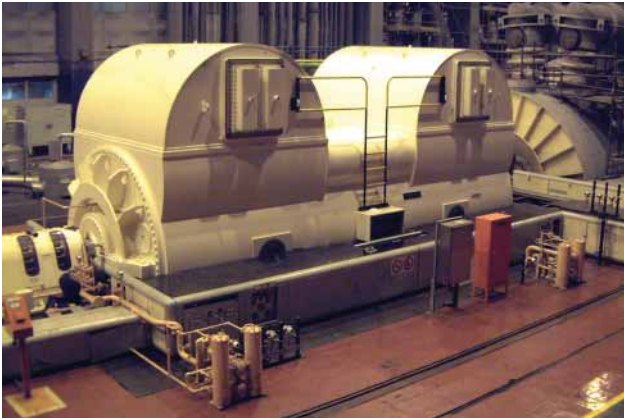


View of turbine building

The Maritsa East-2 thermal power plant which is the highest capacity thermal power plant in Bulgaria has 8 units of steam turbine and generator sets and 1,450 MW output in total. The first unit was built and started commercial operation in the 1960s, since then the number of plants has increased with the current type of plant coming on line in the 1980s. The units have been deteriorating in efficiency, output and reliability year by year due to their long term operation. However, with the exclusion of partial work on the plant, a large scale rehabilitation such as this has never been executed in the past. The first priority of the project is to improve total efficiency by increasing output, reliability and longevity of the units via the replacement of turbines, generators and auxiliary equipment with new units made by Toshiba according to the condition of the units.

This project is in line with the national policy of Bulgaria, which is expected to join the EU in January 2007. Engineering work has commenced and construction work will start from unit 1 this year. Units 1 and 2 are scheduled to be commissioned on February 28, 2007 and the last unit 6 on February 28, 2009.

445 MVA Generator Replacement from Water to Hydrogen Cooling with a 15% Capacity Up-grade



Hydrogen-cooled turbine generator (445 MVA-15 kV-0.9 p.f.-99%)

In Africa, Toshiba has made a contract with a power company to replace generators made by another manufacturer in a fossil power plant with a total of six complete new 445 MVA generators in May 2003. The installation of the first unit and the running tests at the site were successfully completed in November 2004.

The main design features of Toshiba's generators which have been set to meet the customer's needs are as follows:

- The cooling method of the stator coil is changed from water to hydrogen cooling, which offers customers easy maintenance and operation.
- 15% upgrade in capacity is achieved without modification of the existing foundation by adopting the following technologies.
 - Stator winding insulation system with high thermal conductivity
 - Compact and low vibration stator frame designed by proven analysis methods

Major Equipment for Two Indian Projects Shipped in Fiscal Year 2004



Shop assembly of pump-turbine for Purulia Pumped Storage Plant

The major equipment for two Indian Hydro-Power Projects was completed and shipped in fiscal year 2004.

The first unit of pump-turbine for Purulia Pumped Storage Plant, whose owner is the West Bengal State Electricity Board, India, was completed at Keihin Product Operations and shipped in February, 2005. Toshiba is a technical leader of the consortium comprised of Mitsui & Co. Ltd., Mitsubishi Heavy Industries Ltd. (MHI) and Toshiba. Toshiba and MHI each supply two Toshiba designed pump-turbines respectively and Toshiba will also supply four generator-motors.

The ratings of the pump-turbine are as follows:

- Generating operation: 259.3 MW-214.5 m-250 min⁻¹
- Pumping operation: 218.9 m-141 m³/s-250 min⁻¹

Though the operating head range is relatively wide in Purulia pump-turbines, no cavitation within the entire operating range is generated in accordance with the specifications. The performance including efficiency and cavitation has already been verified by the model test. The size of pump-turbine is relatively large with a casing diameter of about 13 m.

The water turbine stationary parts for units 2 and 3, the turbine runners for units 1 and 2, and the generator for unit 1 were also completed and shipped in fiscal year 2004 for Teesta Power Plant, India, whose owner is the National Hydroelectric Power Corporation Ltd, India. All the generating equipment for Teesta PS including three water turbines and generators is supplied by Toshiba.

The ratings are as follows:

- Water turbine: 173.5 MW-197 m-214.3 min⁻¹
- Generator: 189 MVA-13.8 kV-50 Hz

DCS with Intelligent-Type I/O Boards Shipped



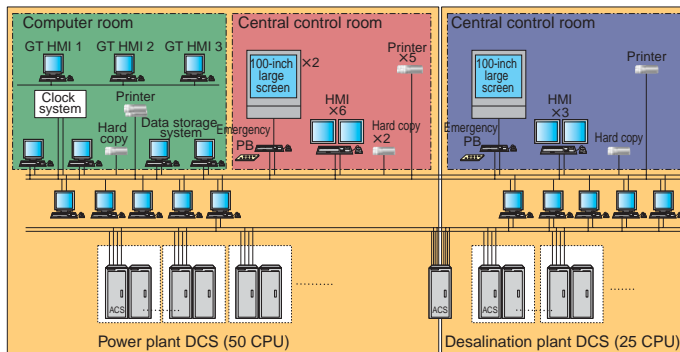
DI board AI board DO board AO board Intelligent I/O board

Recently Toshiba has become one of the leading companies that build power plant projects on an EPC (Engineering, Procurement, Construction) basis. Toshiba applies its own DCS (Distributed Control System), TOSMAP-DS™ to the EPC projects because the DCS is one of the key components which determine the plant characteristics. In 2004, plant DCSs, TOSMAP-DS™ were shipped consecutively to

- Jebel Ali L1 Power Station, UAE,
- Umm Al Nar Power Station, UAE,
- Tanjung Jati Power Station, Indonesia.

The TOSMAP-DS™ utilizes state-of-the-art technologies which realize high-level controllability, human-friendly man-machine interface and versatile communication with other systems. Especially in the case of the Jebel Ali L1 Power Station, where a special-type DCS is applied to satisfy the requirements of the Middle East market. Intelligent-type I/O boards which have the capability of 1 ms resolution for digital input and 50 ms scan for analog input have been developed for this project. The I/O boards developed have given TOSMAP-DS™ a competitive edge in the worldwide market.

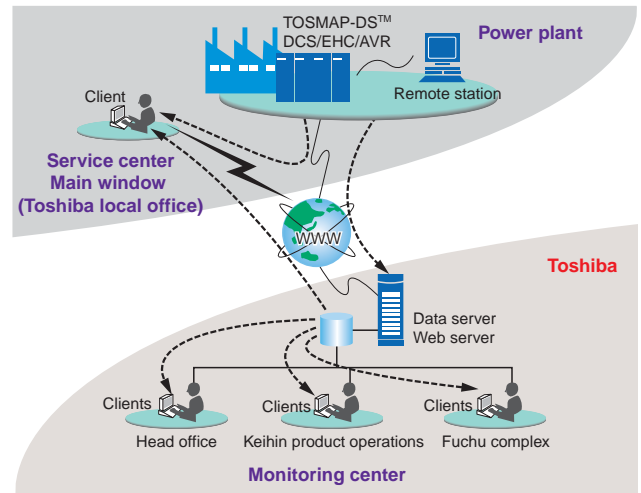
Commissioning of TOSMAP-DS™ shipped for each project has been started and all the projects will surely be completed successfully.



HMI: Human/Machine Interface PB: Push Button ACS: Automatic Control System

DCS system configuration for Jebel Ali L1 Plant

Remote Monitoring and Diagnostics Service for Thermal Power Plant in North America



DCS: Distributed Control System
EHC: Electro Hydraulic Control system
AVR: Automatic Voltage Regulator

System configuration of remote monitoring and diagnostics service

For the purpose of supporting the customers in supervising normal operations and resolving problem status, Toshiba has developed a remote monitoring and diagnostics service through the application of information technology.

In this service, the turbine vibration values, process values and status of controllers are monitored. Therefore Toshiba is able to provide plant condition reports for normal operations, propose improvements for plant equipment, and offer prompt support to the customer in the event that problems occur. These services adequately leverage the knowledge and experience of Toshiba as a fabricating laboratory.

Toshiba is operating these services in the High Desert Power Station (California) of the Constellation Energy Group and Forney Power Station (Texas) of Florida Power and Light Energy.

Micro Hydro Power Generating Equipment for Taiwan Sewage Treatment Plants



Micro hydro power generating equipment for sewage treatment plant in Taichung Science-Based Industrial Park

Toshiba has supplied micro hydro power generating equipment for sewage treatment plants in Hsinchu Science-Based Industrial Park and Taichung Science-Based Industrial Park in Taiwan. The output power of the equipment is 11 kW (Hsinchu) and 68 kW (Taichung) respectively.

The equipment generates electric power by effective use of the unutilized potential energy of discharge water from the sewage treatment plant. In other words, it can contribute to reducing greenhouse gas emissions. Electric power generated by this equipment will be used as a power supply for exhibition hall lighting, etc. (Hsinchu) and for outdoor lighting, etc. (Taichung). A synchronous generator is adopted to enable stand-alone operation.

The two sewage treatment plants in Taiwan are both newly established, so the micro hydro power generating equipment will be tested and will start proper operation after the operation of the plants begins.

Guangzhou Toshiba Baiyun Control System Engineering Co., Ltd. Starts Operation

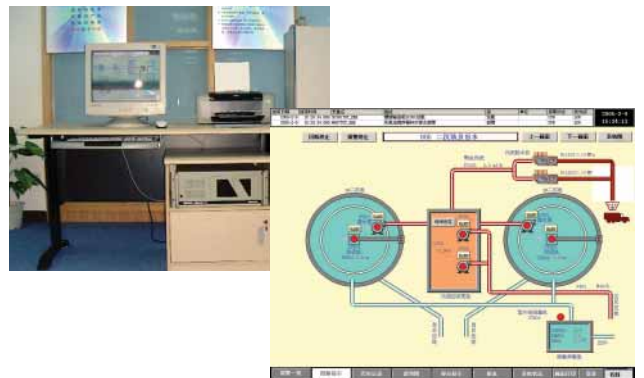


Guangzhou Toshiba Baiyun Control System Engineering Co., Ltd. (GTBE)

The joint venture company between Toshiba Corporation and Guangzhou Baiyun Electric Equipment Co., Ltd., named Guangzhou Toshiba Baiyun Control System Engineering Co., Ltd. (GTBE) started operation on June 8, 2004 in Guangzhou, China.

GTBE's main activities are engineering and manufacturing electrical facilities, and their sales are mainly in the southern part of China. Such electrical facilities include, for example, supervisory control systems and switchgears for water and sewage treatment plants and buildings.

The economic growth of China has been accompanied by rapid urbanization, and investment is increasing in the field of infrastructure like water and sewage treatment plants. In this situation, having received technical know-how from Toshiba, GTBE has achieved significant results, such as a contract to supply the total electrical facilities for a sewage treatment plant.



Supervisory control system for water and sewage treatment plant and a screen image

Supply of Electrical Equipment for Proto-Type Electric Locomotive in China



Electric locomotive in operation

Presently in China, a large increase in railway transportation is being planned and promoted. Leading up to this, Toshiba and CNR Dalian Locomotive & Rolling Stock Co., Ltd. supplied a proto-type high power AC electric locomotive with 7,200 kW traction power to haul 5,000 t load to the Ministry of Railway China under mutual collaboration. Toshiba developed the TCMS (Train Control Monitoring System), which controls the whole locomotive's electrical systems, and the PC (Power Converter), which is the main component of the traction system.

The PC consists of a 4,500 V-900 A IGBT (Insulated Gate Bipolar Transistor) for power line and controls 6 traction motors individually by axle load control, and a forced water circulation cooling system is adopted in consideration of severe ambient conditions. Thanks to these features, the PC achieves high adhesion and redundancy of the locomotive traction system. Also, a 230 kVA auxiliary power supply unit is installed in the PC. The TCMS manages all of the control and monitoring for the entire locomotive system, which improves driver convenience drastically.

This proto-type locomotive has been operating well in North China and is receiving high acclaim from the customer.

Thanks to the success of this proto-type locomotive, our partnership won an order for 60 electric locomotives with the same capacity and they are now being designed and manufactured.



Power converter

Propulsion System for Electric Multiple Unit for Metra, U.S.A.



Traction motor



VVVF inverter

Propulsion system for electric multiple unit (VVVF inverter and traction motor)

Toshiba has developed and manufactured a propulsion system, the VVVF (Variable Voltage Variable Frequency) inverter and the traction motor, for a new series bi-level electric multiple unit for the Commuter Rail Division of the Regional Transportation Authority D/B/A Metra, Chicago, U.S.A.

For the development and design of the equipment, the following major features were taken into consideration, and a VVVF inverter with a natural cooling system and totally enclosed traction motor are employed.

- Dealing with severe winter weather (freezing, snowfalls) in the Chicago area
- Large reduction in maintenance labor

The cars equipped with our system will be used on the Metra electric line, which has a length of approx. 50 km, and links the downtown area of Chicago with the south suburbs area in about 1 hour. The running tests for the cars will be performed from the end of May, 2005.

LF600 Electromagnetic Flowmeter Converter



LF600 electromagnetic flowmeter converter

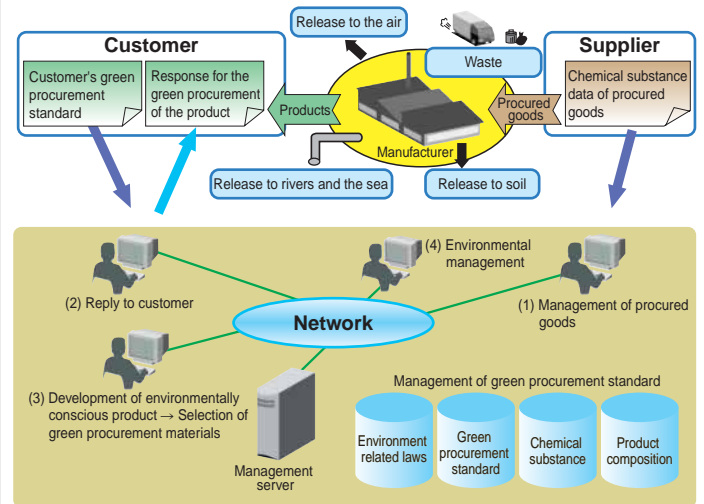
Electromagnetic flowmeters are used in a wide range of fields because of their high-accuracy and ease of maintenance. The overseas market is tending to expand centering on countries such as China and Southeast Asia.

Toshiba has developed the LF600 aiming at an increase in sales in the overseas market.

The main features are as follows:

- Interchangeability with the current model is maintained.
- It is possible to operate it without opening the cover thanks to the adoption of the infrared-ray switch.
- Display information on the HMI (Human-Machine Interface) is increased by adopting a full dot liquid crystal display (LCD) device, and the visibility is improved.
- An easy-to-see LCD display device with fully optional installation direction.
- It is possible to correspond to various communication standards by adding optional boards.

Green Procurement Software “Eco 倶楽部”



Chemical substance management by Eco 倶楽部

This green procurement management software has been launched on the market as the Eco 倶楽部 series software package that is sold to manufacturing businesses. This software enables the user to perform the integrated management of RoHS (Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment) directives of the EU that will become effective in July 2006 and the chemical substances specified by JGPSSI (Japan Green Procurement Survey Standardization Initiative), which is a domestic standardization organization. This product is equipped with data on more than 3,000 chemical substances that are the target of environment-related laws, and allows a step by step survey for efficient recovery by setting the priority of the chemical substances to be controlled.

When requested to manage substances by a different method for each customer, the software can easily perform the aggregate management for each supplier and easily judge and report whether an in-house product is compatible with the customer's procurement conditions or not.

The software is also capable of setting the threshold for the amount of use for each chemical substance, and automatically discriminates when the threshold is exceeded by converting the weight of chemical substances for each unit of parts, assemblies and products.