

Creating
a Dramatic
Future

PRODUCTS CATALOG

MITSUI ENGINEERING &
SHIPBUILDING CO.,LTD.

Mitsui Engineering & Shipbuilding Co., Ltd. (hereinafter called "MES") started its business in 1917 as a shipbuilding division of Mitsui & Co., Ltd. in Tamano City, Okayama Prefecture.
Since then, its shipbuilding technology has been diversified, developed and extensively applied to many fields of the society such as production of industrial machinery including diesel engines, construction of chemical plants, social infrastructure projects including bridges, logistic systems including various cranes and further to environmental equipment.

MES, uplifting a phrase "To continue working as a company trusted by society and individuals through products and services we offer" as the company philosophy, is now unfolding a new drama into the future to contribute to the development and prosperity of the international society coping seriously with global environment preservation and to materialize the dream and hope of human beings.

Creating a Dramatic Future

A new drama is now unfolding completely in harmony with the global environment

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Ship and Ocean

please look at the product information of the WEB site of our company.

http://www.mes.co.jp/english/business/ship/index.html

Commercial Ships



Spherical Tank Type LNG Carrier

A ship to carry liquefied natural gas in her independent spherical tanks. The photo shows "GRAND MEREYA", a 145,000m³ type LNG carrier.



Membrane Type LNG Carrier

A ship to carry liquefied natural gas in her membrane tanks. The photo shows "PUTERI DELIMA SATU", a 137,100m³ type carrier.



LPG Carrier

Photo shows “MAERSK HOLYHEAD”, a liquefied petroleum gas carrier of 20,500 m³ type.



VLCC (Oil Tanker)

Very Large Crude-oil Carrier (VLCC) of 310,000 dwt named “GASSAN”.



Afra-max Tanker (Oil Tanker)

Afra-max tanker is a tanker capable of carrying 80,000 to 120,000 tons of crude oil. Photo shows, Afra-max tanker of 110,295 dwt named “MARE ORIENS”.



Cape-size Bulk Carrier

A ship to carry bulky cargo such as grain, iron ore, coal, etc. The photo shows “NEW EXPEDITION”, a 174,600 dwt bulk carrier.



Handy-max Bulk Carrier

“neo56BC”, the new generation eco-ship of “Mitsui 56”. This keeps the superior usability and reliability of “Mitsui 56” which is highly appreciated in the market and more than 170 units have been delivered. This photo shows “AFRICAN PUFFIN”.



Ultra-max Bulk Carrier

Unprecedented "wide beam shallow draft vessel" called "neo66BC", which is the pioneer of the eco-ship as the first ship of our line up "neo series". This photo shows “DRAFTSLAYER”.



Open Hatch Type Bulk Carrier

One of the largest open hatch general cargo carriers in the world with box-shaped cargo holds and four (4) jib cranes for handling forest products and container. This photo shows “PETREL ARROW”.



Ore Carrier

A specialized ship for carrying iron ore. The photo shows "BRASIL MARU", the world largest class 320,000 dwt ore carrier. The Ship is awarded "Ship of the Year 2007".



Container Carrier

A specialized ship for carrying containers. The photo shows "NYK SIRIUS", a container carrier which can carry 6,200 containers (in terms of 20 feet container).



Refrigerated Carrier

Large size refrigerated cargo carrier leading the worldwide transportation of perishable foodstuffs with high technology and outstanding performance. The photo shows "STAR QUALITY" with cargo hold capacity of 615,000 cf.

Governmental and Naval Ships



Destroyer "FUYUZUKI"

A 5,000-ton type destroyer for Japan Defense Agency on its 2009 Fiscal Year Plan (completed in Fiscal Year 2013) being the 4th destroyer of "AKIZUKI" standard type destroyer. This is the 21th destroyer built by MES.



Ocean Surveillance Ship "HARIMA"

A 2,850-ton type acoustic surveillance ship for Japan Defense Agency on its '90 Fiscal Year Plan (completed in Fiscal Year '91). Its first sister ship "HIBIKI" was also built by MES. SWATH type hull form is adopted for this standard ship.



Tank Landing Ship "OSUMI"

This is the first ship of 8,900-ton tank landing ship series for Japan Defense Agency on its '93 Fiscal Year Plan (completed in Fiscal Year '97), and its 2nd ship "SHIMOKITA" was also built by MES. The ship accommodates 2 units of air-cushion landing craft (LCAC).



Mine Sweeper Tender "BUNGO"

A 5,600-ton type minesweeper tender for Japan Defense Agency on its '95 Fiscal Year Plan (completed in Fiscal Year '97) having a mine laying equipment.



Submarine Rescue Vessel "CHIHAYA"

A 5,400-ton type submarine rescue vessel for Japan Defense Agency on its '96 Fiscal Year Plan (completed in Fiscal Year '99) accommodating one unit of Deep Sea Rescue Vehicle (DSRV). Submarine rescue tender "CHIYODA" was also made by MES for Japan Defense Agency on its Fiscal Year '81 Plan.



Fast Combat Support Ship "MASHU"

The first ship of 13,500 ton fast combat support ship series for Japan Defense Agency on its 2000 Fiscal Year Plan (completed in Fiscal Year 2003) and the biggest ship in the fleet of Maritime Self Defense Force of Japan. The ship has mid-sea refueling facility and on-board convey system for supply goods.

Ship and Ocean

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Governmental and Naval Ships



Patrol Ship "ECHIGO"
A patrol ship for Japan Coast Guard accommodating helicopters on its 1987 Fiscal Year Plan (completed in Fiscal Year 1989).



Patrol Ship "HATERUMA"
A 1,000-ton type patrol ship for Japan Coast Guard on its 2005 Fiscal Year Plan (completed in Fiscal Year 2007).



Hydrographic Survey Ship "SHOYO"
A large hydrographic survey ship for Japan Coast Guard on its '95 Fiscal Year Plan (completed in Fiscal Year '97) The ship is awarded "Ship of the Year 98".



Fishery Research Vessel "KAIYO MARU"
A flagship of the fleet of Fisheries Research Agency, Japan, equipped with various acoustic device and large trawling net for surface and intermediate waters for the purpose of research of fishery resources and oceanographic environment covering all sea areas from drift ice area to tropical area.



Deep Sea Scientific Riser Drilling Vessel "CHIKYU"
A scientific drilling vessel proposed by Japan Agency for Marine-Earth Science and Technology as a core vessel for Integrated Ocean Drilling Program (IODP), an international research program now underway. The most efficient deep sea drilling equipment in the world of the vessel can reach down to 7000 meter depth from the sea bottom of 4000 meter deep, which enables sampling of rocks and sediments and their testing and measurement that has never been possible until today. The vessel with such research equipment is expected to contribute to find the mechanism of global warming, earthquake and further to investigate the origin of life etc.



Training Vessel “Taisei Maru”
Training ship for coastal service built for National Institute for Sea Training. Bridge is arranged in the center for the first time, and it has a hull, apparatus, and equipment suitable for training of a coaster member.



Training Ship “Oshoro Maru”
Training ship for Hokkaido University, satisfying the needs of the fishery science field. It is expected as an educational platform which practices education research of a world level.



Maritime Meteorology Observation Vessel "KEIFU MARU"
A maritime meteorology observation vessel for Japan Meteorological Agency for observation and monitoring of global environment and climate change and for climate analysis.



Waste Recovery Vessel "MIZUKI"
A twin hull sea surface cleaning vessel for recovery of floating debris by a waste recovery equipment in the middle of twin hulls.



Research and Survey Vessel "YAYOI"
An aluminum alloy research and survey vessel for Tokyo University of Marine Science and Technology. This vessel is used also for commuting vessel.



Fishery Patrol Vessel "TSURUGI"
A high-speed vessel with a water-jet propulsion system with an optimum hull form for better maneuverability in rough sea. This most advanced fishery patrol vessel for an efficient guidance and enforcement of law is expected to contribute a lot to the law and order in the fishery circle.

Passenger Ships



Under-water Viewing Boat
This boat enables the passengers to enjoy underwater edge-on view while sitting on the chair provided in the cabin below water surface. MES has building record of 25 such units in and out of Japan.

Ship and Ocean

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Oil and Gas Production Equipment



Floating Production, Storage and Offloading system (FPSO)

A floating system for production and storage of oil and gas at sea to deliver them to oil tankers directly on the sea. The photo shows "FPSO Cidade de Angra dos Reis MV22".



Tension Leg Platform (TLP)

A floating platform suitable for deepwater (deeper than 1,000m) oil and gas field development. This can also be utilized as oil/gas production platforms and well head platforms.

Work Boats



Salvage Tug

The "FAIRMOUNT SHERPA", a 3,239 ton salvage tug boat boasting of tug capacity of the world largest 200 tons.



Harbor Tug Boat

The biggest class tug boat in Japan with 4,000 ps for port service use. Photo shows "NIIGATA MARU".



Buoy Tender

This is a work boat for installation and maintenance of channel buoy. The photo shows "PEDOMAN", a 903 g/t buoy tender for Malaysian Government now under operation in Malacca Strait.

Fishing Boats



Roundhaul Netter

A ship to enclose schools of fish (tuna and bonito) by net and gather up the net bottom like a purse to make a wholesale catch of the fish. The photo shows "No.35 HAKKO MARU", a 499 gross ton roundhaul netter.



Tuna long liner

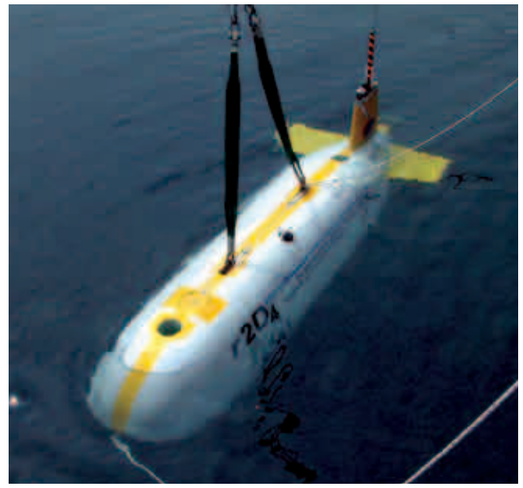
The fishing boat which catches tunas by floating longlines. The photo shows "No.123 SHOEI MARU" (439 g/t).

Underwater Vehicles



Deep Sea Survey Vehicle

A tethered underwater vehicle which can be operated up to 10,000 meter depth for various sea bottom survey and other work. Products line up of MES covers "KAIKO", "DOLPHIN 3K", and "BENKEI".



Autonomous Underwater Vehicle

MES manufactures untethered underwater vehicles such as “R-One Robot” and “r2D4”, which inherits “R-One Robot” performance and can compose observation route on self-judgment (diving to 4,000meter depth). Photo shows “r2D4”. (Photo credit by Tokyo University).



Autonomous Underwater Vehicle

Smaller sized untethered vehicle "AQUA EXPLORER 2000" which can autonomously navigate for submarine survey, submarine cable survey up to 2000 meter depth.



Remotely Operated Underwater Vehicle (ROV)

ROV series with capabilities of high-speed divining and strong current resistance are equipped with high-resolution camera. Products line up: For depths of 50m, 100m, 300m and 500m.



Underwater Vehicle for Inspection

An underwater vehicle which can move freely for inspection and cleaning even in a flow water such as in intake channel of power station.



Autonomous Underwater Vehicle (for Lake and/or Marsh)

Small size non-tethered underwater vehicle which can be operated for a survey of water quality and/or mud build-up of lake, marsh, dam and water reservoir. This vehicle can send underwater image and transmit signals.



Water Service Pipe Inspection Vehicle

Ultra small remotely controlled vehicle to inspect inside condition of water service pipes (inside diameter of larger than 500mm and under water pressure lower than 1MPa) such as corrosion, condition of joint station, parts, etc. without suspension of water flow.

Ship and Ocean

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Ship Machinery and Navigational Equipment



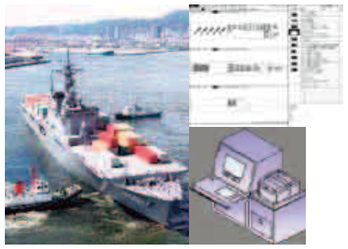
Anti-Rolling Rudder System

A system to make an automatic operation of rudder to decrease ship's rolling by predicting ship motions by a computer.



System Maneuvering Equipment for Ship

A system to enable highly detailed movement of a ship and/or offshore construction by controlling propulsion propeller and thruster against current, wind and wave by simple operation. The system can also have additional specialized capability such as maintenance work etc.



Cargo Loading Planning System

A system to make a loading plan for various cargoes on a CRT screen by a simple mouse operation and to find out a ballast plan easily out of such loading plan.



Dynamic Positioning System (DPS)

A system to keep a vessel at fixed position by an automatic operation of rudder and side thruster by way of predicting ship movement in advance by computer.



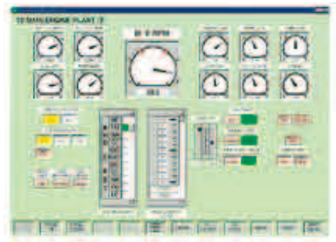
Navigation Bridge Information Display System

This system is developed for improving bridge work, labor saving, enhancement of reliability and safety in the destroyer navigation bridge. The system displays on a screen, ship speed, direction of navigation, draft, direction of wind and wind velocity by means of automatic calculation by computer.



Ship Maneuvering Simulator

A Training System for Ship Maneuvering. Students can operate the same equipment as installed on a ship for training while watching a front view ahead of the ship on a large screen.



Engine Simulator

This Marine Engine Simulator for simulation of engine room operation by general use computer is the most appropriate system for training of engine operation in many seamen's schools and or maritime institutions.



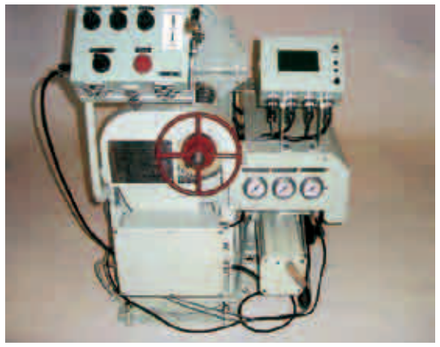
Solid Waste Treatment Equipment

An equipment to decrease the volume of solid wastes on board naval ship such as burnable wastes, non-burnable wastes and plastic wastes. The system is composed of shredding/volume decreasing process, plastic volume decreasing process, washing process and dehydrating process.



Deck Crane

A ship crane for lifting/lowering of complex work boat (RIB) stored in a naval ship and for loading/unloading of general cargo. The crane has folding and extension-type boom with auto-tension mechanism and remote control unit for winch.



Automatic Control Winch

This is a winch developed by MES to decrease up-and-down movement of the hanging instrument caused by ship's motion by compensating the movement with a winch drum control by computer. The winch drum is precisely and delicately controlled based upon the ship motion data obtained by measuring equipment on board the ship. This winch is specially developed for hanging down an observation equipment etc. into the sea. The photo shows winch control equipment ddvc (direct drive volume control).



Evaporator Unit for LNG Carrier

LNG evaporator (U-Tube Type Heat Exchanger) firstly developed in Japan by MES and installed already on more than 30 LNG carriers. The photo shows the evaporator unit during its performance test.



Ship Berthing Support System

This is an on-board type ship berthing support equipment of low cost which measures a distance between the ship and the berth automatically by means of millimeter wave radar and supply the information of berthing condition in timely manner.



Wave Observation Facility

A facility for observation of wave height and wave direction, so called "Mafuko Tower"

Logistics Systems

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http://www.mes.co.jp/english/business/logistic/index.html



Quay Gantry Crane “PORTAINER”

A crane for loading and unloading containers from/to container carrier and container yard built under technical license agreement with PACECO, USA.



Container Yard Transfer Crane “TRANSTAINER”

A crane to transfer containers in the container yard to load and unload containers on and out of trailer manufactured under the technical license agreement with PACECO, USA.



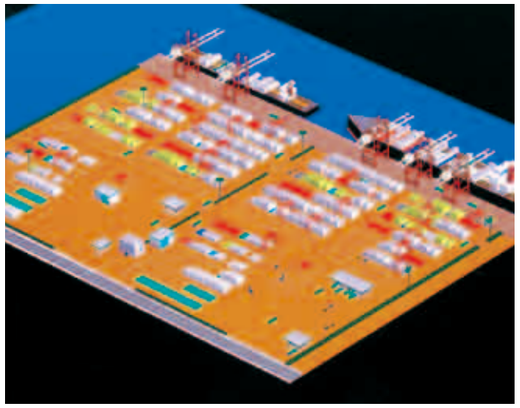
Grab Bucket Bridge Type Crane Unloader

A crane for handling of bulky cargo such as coal, ore etc.



Gantry Crane on board Ship

A gantry container crane installed on board the ship manufactured under the technical license agreement with PACECO, USA.



Container Terminal Simulation System

A container terminal simulation system which enables a feed back to an actual handling business by displaying a terminal operating condition in 3D-CG animation by connecting directly with container terminal management system using container storage information and storage/loading plan in the container terminal.



Container Terminal Management System

A management system for automation of container terminal. The photos (right) show the gate system and YP/VP plan displayed of on the screen.



Bridge Type Crane for Shipment of Products

A cargo handling equipment used for shipment of products.



Goliath Crane

This crane is used for transferring and assembling of hull blocks to build ships. The photo (near side crane) shows1,000 ton Goliath crane at MES Chiba Works.



Bridge type Crane with Cantilever at Both Sides

A crane for transfer of hot slab and/or cold slab in the steel mill.



Jib Crane

This is a crane to be used for shipbuilding and other construction/assembling job in and outside of factory.

Construction of Social Infrastructure

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Extradosed Bridge

The newly built Japan-Palau Friendship Bridge is the bridge having an integrated extradosed system, linking Koror and Babeldaob Island in Palau. Total weight of steel girders is about 556 tons and its length is about 85 meters.



Revolution type Floating Bridge

This is the world first revolution type bridge connecting Yumeshima and Maishima in Osaka Bay. The bridge ("Yumemai Bridge") has an overall length of 410 m and is composed of double arch type upper structure and 2 pontoons. In case of emergency, the bridge can be revolved to pass huge ships. Steel weight is 33,000 tons.



Rationalized Truss Bridge

This bridge is constructed decreasing number of truss members and shortening welding length. Further, by the adoption of MES's Steel-concrete composite slab "MESLAB", labor-saving, shortening of site construction period and economic enhancement were achieved. The type of bridge is of 5 spans continuous warren truss with the length of 412 m and its steel weight is 1,426 tons.



Junction Bridge

MES completed Tosu Junction Bridge consisting of 5-spans continuous non-composite box girder and 2-spans continuous non-composite box girder. Lengths of each span are 58.60m+75.00m+77.00m+65.00m+50.20m+82.00m+82.00m. Total weight of steel is 2,061 tons.



Short Time Construction System of Cross Over Bridge

Superstructure and bridge pier are made of steel structure and the foundation is made of pre-cast concrete footing. The application of such construction system drastically shortens the construction period, which used to be 2 - 3 years. (Photo shows the "Keio Line Crossover Bridge" in Tsurukawa Way made by the short time construction system.)



Sunken Tunnel Element

"Okinawa Sunken Tunnel Element", the first sunken tunnel element used for Naha Sea Side Road for Airport in Okinawa which connects Naha Airport and Naha City. Element in the picture is No.8 of eight elements of the tunnel and its length is 91m, width 37m and steel weight is 3,180 tons.



PC Hybrid Floating Structure

Many hybrid structures of MES made of prestressed concrete are in use for various port facilities such as floating breakwater, floating wave absorbing dike, floating jetty, etc. The photo shows "Hakata Port Bayside Floating Pier".



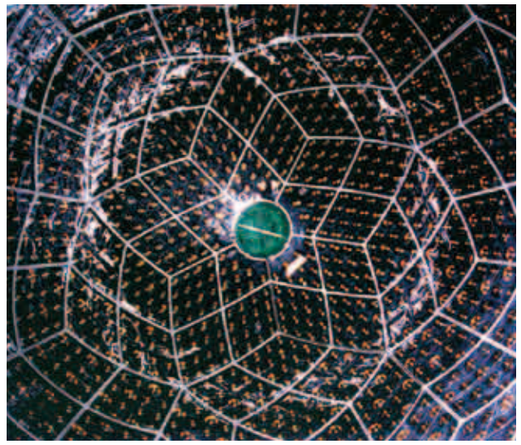
Marine and Land Public Work for Coal Fired Power Station "TANJUNG JATI"

MES completed marine and land public work for this large scale overseas coal fired power station as a package dealer of design and construction work. Construction of turbine house and its associated electric rooms were also carried out in this package work. The work includes marine engineering work for coal unloading jetty, water intake facility etc. and land engineering work includes boiler foundation, smoke stack, coal storage facility, various silos, foundation for transformer station, foundation of various equipment, ash landfill etc. The photo shows the coal fired power station "TANJUNG JATI B" in Indonesia (660MWx2).



Hybrid Caisson

In order to facilitate the circulation of sea water in the area surrounded by breakwater, this breakwater has slits in it for easy coming and going of sea water. The photo shows West No.5 Breakwater in the Boze Fishing Harbor in Hyogo Prefecture.



Liquid Scintillator Antineutrino Detector "KamLAND"

MES constructs various research facilities of elementary particle physics to detect cosmic rays such as neutrino, antineutrino etc. including "Super Kamiokande" for Tokyo University and "KamLAND" for Tohoku University (photo).



Flexible Pier for Ferry

This pier can move horizontally and vertically following the movement of ships at berth by current and tide. It is designed putting priority on the safety of vehicles and passengers to get aboard.



Anti-Seismic Drinking Water Reservoir Tank

A water tank which can supply drinking water in case of an emergency such as earthquake.



Gas Valve

Cast steel product. The photo shows ball valve for city gas piping which is buried underground.

Energy Systems

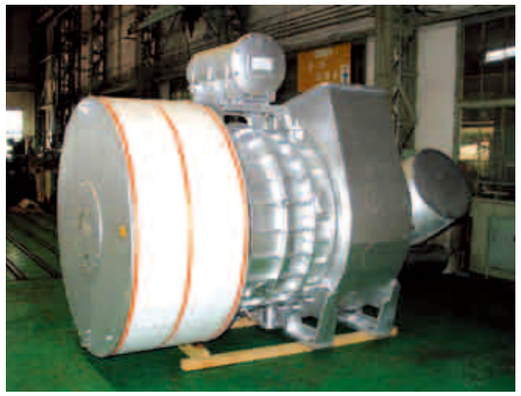
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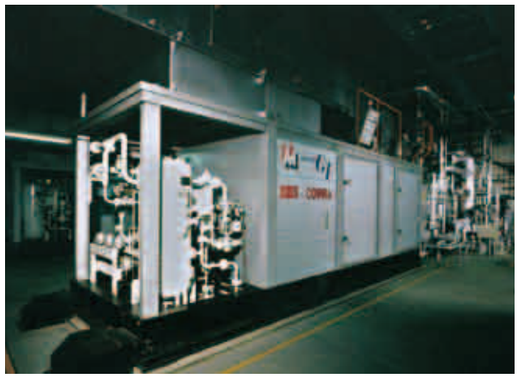
Electronically Controlled Gas Injection Diesel Engine (ME-GI, Mitsui-MAN B&W Type)

MES, based on Mitsui-MAN B&W diesel engines boasting domestic No.1, delivered the world largest class next generation type marine diesel engines. It has such eco-friendly characteristics as decreasing of nitrogen oxides, smoke and soot contained in the exhaust gas.



TCA-type Exhaust Gas Turbocharger (Mitsui-MAN B&W Type)

This exhaust gas turbocharger is developed by MAN for higher performance, lower noise level, enhancement of components reliability, longer life span and easier maintenance. This turbocharger is produced by MES under license.



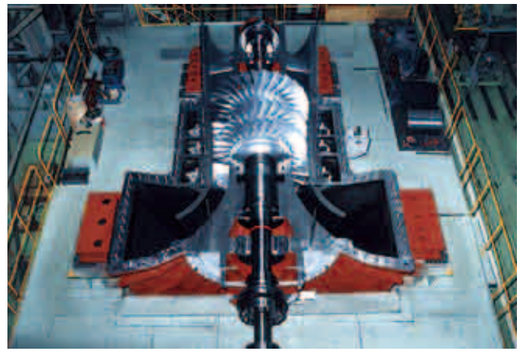
Mitsui Gas Turbine SB5

MES developed this SB5 gas turbine as 1MW class (photo). This is a thermo-electric convertible type gas turbine achieving an increased generation output by 17%, generation efficiency by 2.3% by steam injection and a considerable amount of reduction in NOx emission.



MSC Series Gas Turbine Co-Generation System

This is a co-generation system using gas turbine of Solar, U.S.A. MES has a product line-up of 7 types from 3 to 14 MW, and their generation efficiency is raked highest in their class.
MES boasts of its technology for lower emission of NOx and has delivery records in various industrial fields in Japan. The photo shows MSC70 (7MW class).



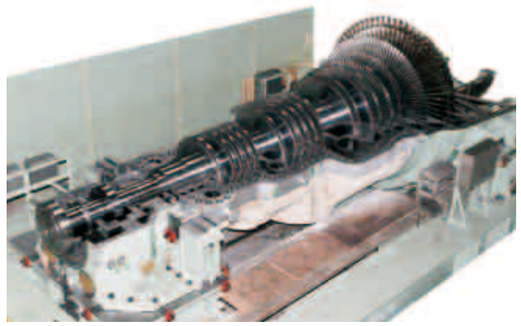
Top Pressure Turbine for Blast Furnace

A turbine to recover the energy of exhaust gas from the blast furnace of steel mill in a form of electricity. MES has already delivered about 60 units of this turbine to major steel mills of the world including 30MW type, the world biggest class. The scope of MES supply includes all-stage variable stationary blade type, axial flow turbine system having reaction blade, wet system and dry system.



Centrifugal Compressor

Centrifugal compressors made by MES own technology widely used for oil refinery, chemical and petrochemical industries same as its reciprocating compressors. MES has a delivery record of about 400 compressors. The photo shows a hydrogen compressor delivered to an oil refinery in Japan. Production Models: 500KW - 40,000KW.



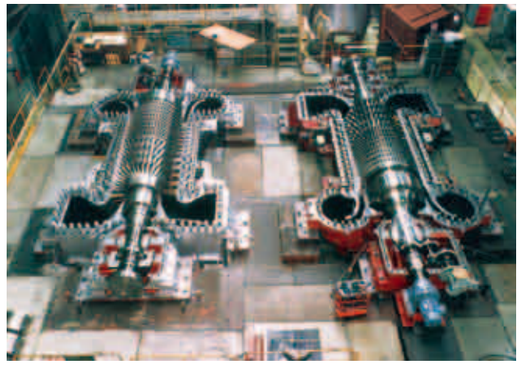
Steam Turbine

MES has a delivery record of about 300 steam turbines for electricity generation and driving of compressor. Highly efficient and reliable steam turbines are now manufactured by MES under a technical license with ALSTOM Power. Various capacities of steam turbines are available from 2MW to 150MW according to the standard module system of MES. They are applicable to the combination of various steam conditions. MES is also manufacturing an advanced high-speed 2-axis type turbine (TM2 series with standard axial flow exhaust).



Reciprocating Compressor

Reciprocating compressors of MES are suitable for high-pressure compression of medium/small volume gas and for compression of light weight gas such as hydrogen. MES has a delivery record of more than 1,000 reciprocating compressors for various purposes including those for oil refinery, natural gas/chemical industry, petrochemical industry and fertilizer industry, which includes the world biggest class 10,000 KW type. Products line up: 40KW – 18,000KW.



Axial Flow Compressor

This axial flow compressor is suitable for compression of large volume and is used for blast furnace in the steel mill, oil refinery and/or air separation. MES, since its original technical development, has delivered about 90 units including world biggest 70 MW type.

Energy Systems

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http://www.mes.co.jp/english/business/energy/index.html



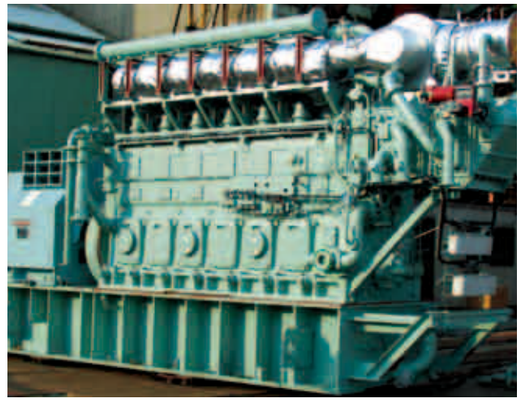
On-Land Diesel Engine Generating Plant

MES offers generating systems driven by slow speed Mitsui-MAN B&W diesel engines.



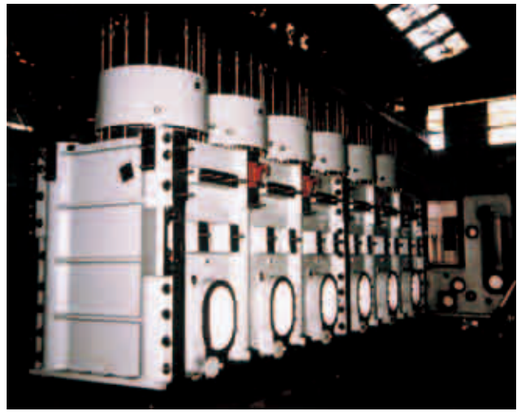
Barge Mounted Power Generating Plant

In this barge mounted generator system, generating equipment driven by diesel engine or gas turbine is mounted on the barge in the shipyard and towed to a local site, by which almost no at-site work is required, but fixing the barge, connecting cables etc. This generating system which minimized at-site work to the extreme is widely used in Philippines, Sri Lanka, Egypt and many other countries of the world.



Gas Engine Co-Generation System

MES's gas engine co-generation systems have the world highest class level generation efficiency and excellent environmental preservation characteristics with clean exhaust gas out of MD20G and MD36G gas engines.



Cylinder Frame

A cylinder frame of a large size diesel engine made of cast iron to support the cylinder liner This cylinder frame has an air supply chamber for combustion.



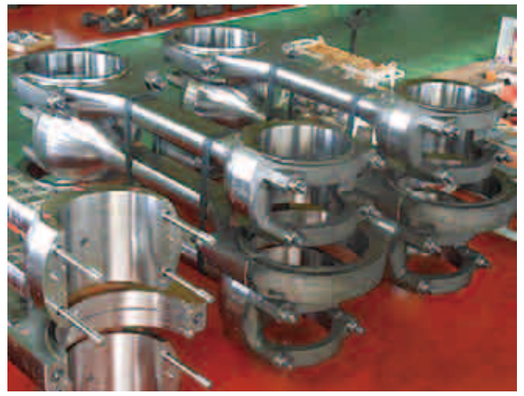
Biomass Power Plant

MES Biomass Power Plant is designed and based on our "Multi Solid Fluidized Bed Boiler (MSFB)" that can utilize varieties of carbon-neutral biomass fuels to significantly reduce CO2 emission comparing to fossil fuels. Further, even though the fuel contains a certain amount of corrosive component, MES MSFB can achieve high electrical efficiency by generating high temperature and pressure steam.



Binary Power Generation Unit (10kW Class Demonstration Package)

Above picture shows our 10kW class demonstration package of middle to low temperature waste heat energy recovery system based on Variable Phase Cycle (VPC). VPC enables to utilize various wasted and unutilized heat energy, such as industrial waste and geothermal energy. Standardized package will cover 50 to 300kW.



Connecting rod

Steel Casting. The photo shows connecting rods for large diesel engine and they are important parts to transmit power of piston to crank shaft.



Fuel Pump

Fuel Pump for Diesel Engine.



Emergency gen-set of 1000kVA

We have installed the emergency gen-set of 1000kVA with Diesel Engine at Mitsui Zosen's headquarters on Jun. 2011.



Emergency gen-set of 5kVA

We have installed the seventeen gen-sets of 5kVA in Niigata. This is used as electric power supply of monitoring posts.



Fuel Valve

Fuel Valve for Diesel Engine.



Hydraulic Cylinder Unit for Electronically Controlled Diesel Engine (ME Engine)

Hydraulic unit to electronically control exhaust valves and fuel valves of diesel engine.

Advanced Machinery Systems and IT-Related Activities

please look at the product information of the WEB site of our company.

http://www.mes.co.jp/english/business/advance/index.html

Advanced Machinery Systems



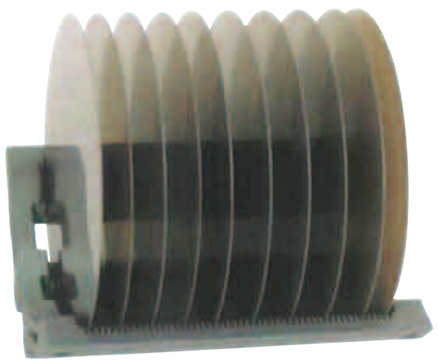
Induction Heater

This equipment is to heat iron and non-ferrous metal to a desired temperature on the principle of electromagnetic induction. Wide varieties of induction heater are available including bar heater, billet heater (photo), pin heater, heaters for wire rod, plate, spring (flat spring and coil spring), rolling line, semi-solidification forging and for thin plate.



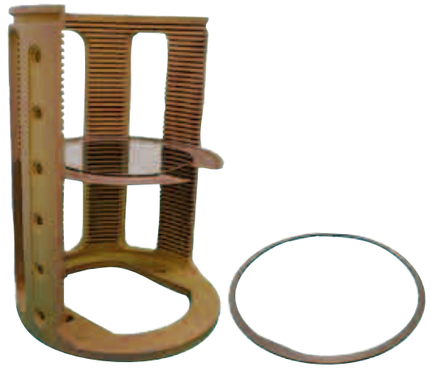
High Frequency Inverter

This high frequency power supply unit causes an electromagnetic induction (alternate magnetic field) in the heater coil. Various kinds of inverter such as thyristor (photo), IGBT, MOSFET, PWN etc. are available and their heating ranges are from tens of kW to 5000kW (maximum) with frequencies 50/60Hz to 400kHz.



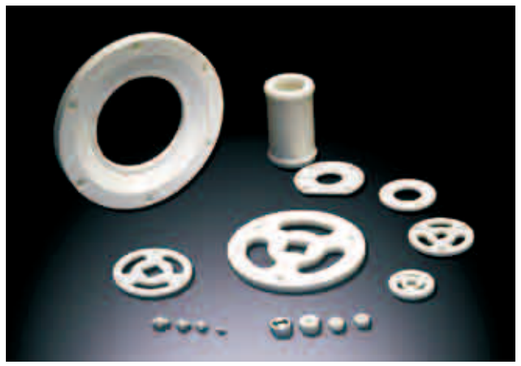
Ultra High Purity SiC Wafer

This wafer, excellent in ultra high-purity, high corrosion resistance, and heat resistance, can be used as a recyclable wafer for a long period. It is especially useful as dummy wafer for LP-CVD and high temperature diffusion processes.



CVD SiC Free Standing Products

Products from this material are lightweight and have high thermal shock resistance, low thermal capacity, and possible to produce in complex shapes. Examples include CVD-SiC freestanding boat and ring (photo).



Oxide Ceramics Products

MES oxide ceramics products meet various semiconductor processes with their high purity and corrosion resistance characteristics. Module parts combined with other ceramics parts and metal parts can also be produced.



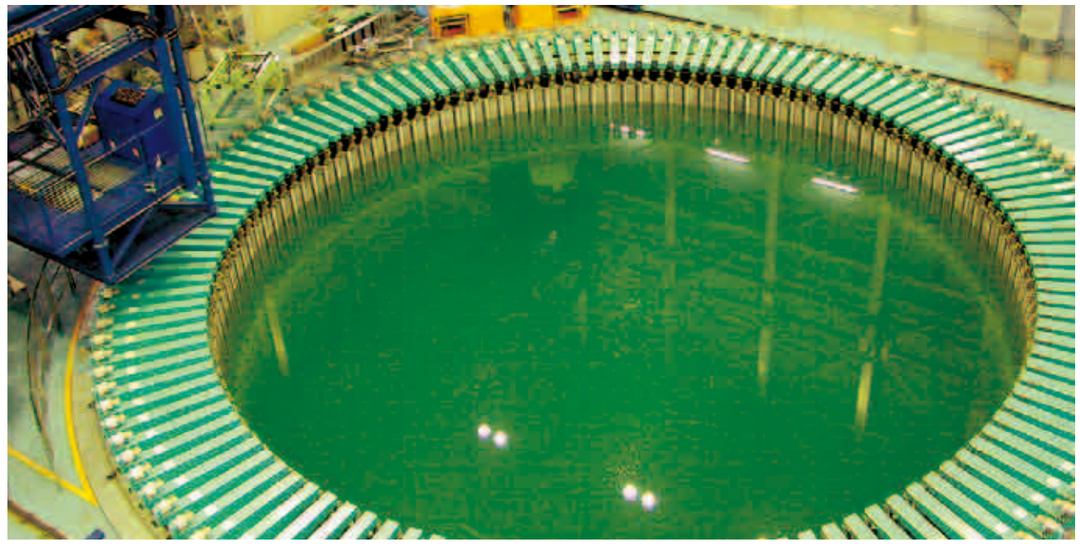
Tunnel Lining Inspection Vehicle

This inspection vehicle detects and measure the inside of the concrete lining by a multi-pass array radar and displays the measurement results in three-dimensional vision, which enables a highly accurate inspection of the tunnel lining in a very efficient way.



Multi-Pass Linear Array Radar

This radar arrays multiple transmission and receiving antennas in linear and receives electric waves, which are transmitted from multiple direction, with multiple passes. Inside conditions of construction are displayed on the screen in 3D image.



Multi-Direction Wave Generator

An equipment developed for hydraulic model test in civil engineering, port/airport construction and in shipbuilding fields. This equipment includes multi-direction wave generator, two-dimensional wave generator, pulling trolley, measuring trolley, circulating water flow generator, two-dimensional waterway and wave generating analysis system.



Sun Tracking Type Solar Light Collector

This solar light collector introduces sunlight into the interior of the house and/or office building. Since this solar light collector has an automatic sun tracking system, it can catch and introduce sunlight very efficiently.



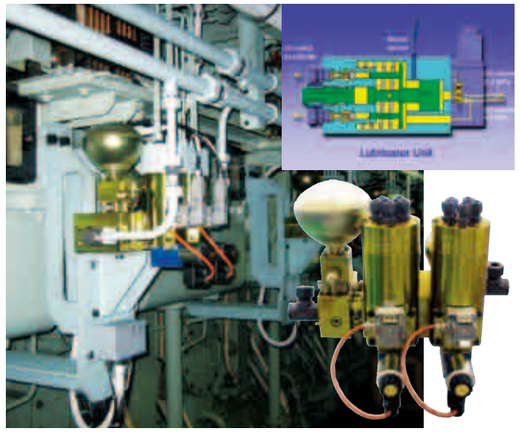
Twin Path Concrete Covering Depth Measurement Sensor

This measurement sensor gives an accurate data for position of reinforced bar, concrete covering depth and relative permittivity in concrete automatically. The results can be stored by electrical data simultaneously.

Advanced Machinery Systems and IT-Related Activities

please look at the product information of the WEB site of our company.

http://www.mes.co.jp/english/business/it/index.html



Alpha Oiler System

This oiler system electronically controls the cylinder oil amount to be put into the diesel engine cylinder, which dramatically reduces the consumption of cylinder oil.



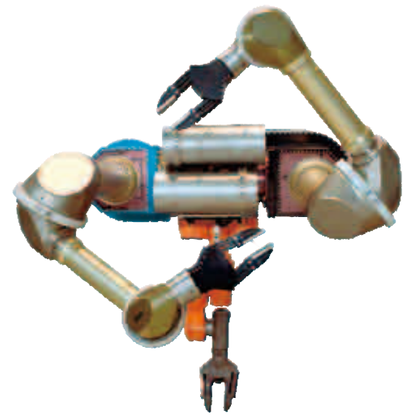
Mitsui Advanced Governor System

This is a turbine control system developed by MES based upon its longtime technical experience and production technology fused with electronic technology. The system is drawing attention as a replacement for conventional mechanical and/or analogue type governors. Product line up covers MAG-R series for Top Pressure Recovery Turbine and MAG-S series for Steam Turbine.



Full-Range Convertible Suction Valve Unloader

This suction valve unloader can adjust the amount of gas flow to a reciprocating compressor in full range (from 0% to 100%).



Power Manipulator

This electro-mechanical power manipulator A1000 type has a delivery record of more than 50 units for hot facilities of the world. This power manipulator is also used for remote control maintenance in reprocessing plants in Japan.



Machine Tool Parts

Cast Iron Products which are used as the main body of NC lathe (photo). The completed NC lathe nowadays is of high precision and high speed and used in many industries including car manufacturing industry.



Axle Box for Railway Vehicles

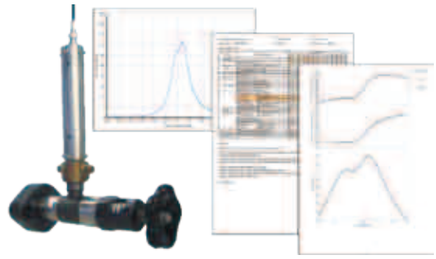
Cast Products. This is used as the part of railway vehicle wheel.

IT-Related Activities



Diagnosis of Diesel Engine and communication tool "e-GICS"

e-GICS is an internet based service which offers diagnosis of Mitsui-MAN B&W Diesel Engine and also serves as a communication tool between customers and our technical staff.



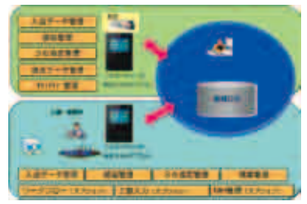
Electronic Cylinder Pressure Measuring System "MES-EPOCH"

It can measure the pressure precisely in a short time, sharing common data between ship and land office and transfer the data to e-GICS data sheet. This system is accepted to combustion diagnosis in "e-GICS".



Oversized Garbage Collection Planning System

This is our original package which can centrally manage individual collection reception for oversized garbage refused by residents, progress of operations, results and output various reports and statistical materials.



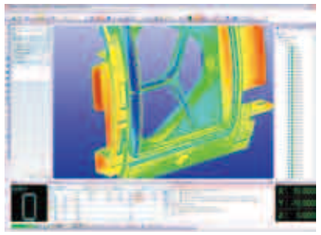
Time Management System "TIME-3"

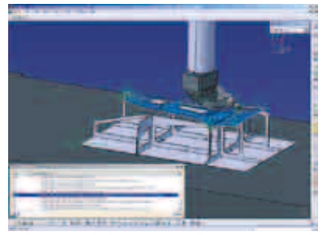
The "TIME-3" is the work management software package. It can check the legal compliance with the Labor Standards Law and manages on appropriate and accurate grasping of working hours etc. The TIME-3 can make data communication to other systems such as personnel affairs/salary system.There are a lot of delivery records of this system for manufacturers and distributors.

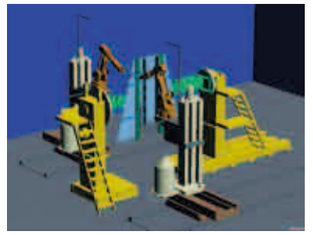


Entrance and Exit Security System “MSSX”

The physical security system to monitor and control entrance and exit of people at office building, factory, research center etc.

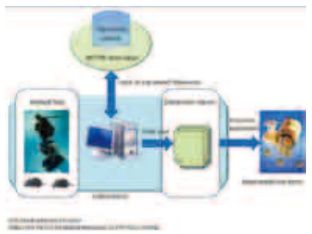






3D Digital Engineering Solution

This is a bundle of 3D simulation software compiling know-how on production technology, CAD/CAM, mechatronics, production management, IT technology, etc. It materializes such wide range of solution as 3 dimensional measuring instructions for measurement tools, virtual design, arrangement investigation, tele-operation, etc.



Mitsui Toxicological Data Processing System (MiTOX)

"MiTOX" materializes big cost cut, rationalization and effectiveness of data control and data handling work at the animal test for safety confirmation of drugs during the development of new medicines based on the regulation of GLP and FDA21CFR Part 11.





"Maritime-SOL" - One Stop Portal Site for Sea Transportation Business

This portal site, which makes a common platform for information, offers one stop service as a complexed general information base for operation of ships in service. MES is tackling with the ship operation support services of the marine-land cooperative type, widely inviting participation of various firms foreseeing to create new services under maritime broadband circumstances.

Plant Engineering

please look at the product information of the WEB site of our company.

http://www.mes.co.jp/english/business/plant/index.html
http://www.mes.co.jp/english/business/energy/index.html



Oil Refinery Plant

The photo shows the catalytic reforming plant (5,000 bbl per day) for Pakistan. MES has a delivery record of more than 120 oil refinery plants.



Petrochemical Plant

he photo shows an ethylene complex (800,000 tons per year) for Saudi Arabia. MES has a delivery record of more than 330 petrochemical plants excluding polymer plant.



Synthetic Resign Plant

The photo shows a elastomer plant for North America. MES has a delivery record of more than 160 plants of this kind.



Inorganic and Fertilizer Plant

The photo shows a phosphoric acid plant (1,500 tons per day) for Australia. MES has a delivery record of more than 150 inorganic and fertilizer plants.



Sulfuric Acid Plant

The photo shows a sulfuric acid plant (102 tons per day) for ADCHEMCO. MES has a delivery record of more than 70 sulfuric acid plants.



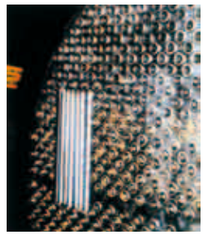
HIVISCOUS Evaporator

An evaporator equipped with plate fin type heater specially developed for a high viscous fluid.



Stainless Steel Resistant to High Temp. High Concentration Sulfuric Acid (SX)

MES offers various SX products such as drying tower, absorption tower, pump, tank, cooler, distributor and other piping materials, which are used under the condition of high temperature and high concentration sulfuric acid. The photo shows an acid distributor made of SX.



Heat Exchanger Cleaning Device - Spirelf System

A cleaning device for the tube of multi-tube type heat exchanger. A spring shaped flexible metal installed and fixed at both ends of the heat exchange tube for keeping it free from fouls by taking advantage of the vibration caused by liquid flow.



Heat Exchanger

MES designs and manufactures the most appropriate heat exchangers to meet various processes and their regulations. The photo shows a fixed tube stencil heat exchanger made of titanium low fin tube.



Reactor

MES designs and manufactures various reactors for liquid reaction by means of catalyst, heat, and mixing. The photo shows a stainless steel clad large reactor with complicate internal coils.



Rotary Dryer

An equipment for drying wet powdered polyethylene and/or such organic acid as terephthal acid, isophthal acid, etc. The photo shows the rotary dryer. MES offers the most appropriate rotary dryer satisfying customers by making structural and performance design following the customer's requirement to the fullest extent.



Rod Baffle Heat Exchanger

In rod baffle heat exchangers manufactured under technical tie-up with Philips Petroleum Company (USA), tubes are supported by alternating rows of horizontal and vertical rods welded to baffle rings. This type of heat exchanger is often used to reduce pressure loss in shell side and tube vibration. The photo shows large rod baffle heat exchanger with titanium tubes.



PV Membrane Separator

A dehydrator for organic solvent such as alcohol using zeolite membrane.



Drum with Mixer and Reactor

An equipment to mix fluid in the drum and/or reactor, which is used for mixing fluid, preventing the fluid from sticking to the body and for other various purposes. The photo shows a reactor with mixer with CE marking.



Tower, Drum and Heat Exchanger

MES manufactures in one-line system the most economically efficient tower, drum and heat exchanger of optimum size based upon the process design to satisfy the material balance and/or heat balance in view of the operation in the plant. MES manufactures products using wide range of material to best fit the purpose including aluminum, cupper, nickel, titanium, zirconium and other alloy of those materials needless to say carbon steel, low alloy steel and other kinds of stainless steel. The photo shows a tower made of zirconium.



Steel Stack

A smoke exhaust system to centralize the smoke from several plants to emit from a high altitude.



Expansion Joint

Expansion Joint are applied in the various equipment in shipbuilding yard, steel mill, petro-chemical plant, power plant, industrial machinery, diesel engine etc.

Plant Engineering

Environment & Recycling

please look at the product information of the WEB site of our company.
http://www.mes.co.jp/english/business/energy/index.html

Recycling of Wastes



Biogas Plant
A plant in which the garbage collected from households and offices are converted, through methane fermentation process, into energy in the form of electricity and/or heat, thereafter the residual garbage are used for fertilizing composts. The photo shows the Garbage Biogas Plant completed in Takigawa City, Hokkaido, the biggest of its kind in Japan.



Biogas Plant (Community Material Recycling System “Ohki Recycling Center”)
Garbage, human waste collected from household and business establishment and sludge from waste water treatment tank are utilized as energy by converting them to electricity through methane fermentation, thereafter the residual liquid are used as an organic liquid fertilizer for rice and wheat culture. The photo shows the plant completed in Ohki Town, Fukuoka Prefecture.



Biogas Plant (Methane Fermentation Plant for Livestock Farming)
Livestock excrement is converted into electricity and/or energy through a methane fermentation. Residual liquid is used as liquid organic fertilizer. The photo shows the plant completed in a stock farm in Akan Town in Hokkaido.



Recycle Plaza
A facility to make an automatic sorting of cans, bottles and plastic bottles for recycling.



Biogas Plant (MKE BIMA station Miura)
A plant in which the human waste, sludge from waste water treatment tank, residue of crops and fisheries, sludge from sewer are converted, through water treatment and methane fermentation process, into energy, thereafter the residue are used for fertilizing composts. The photo shows the plant completed in Miura City, Kanagawa Prefecture.



Distilled Alcohol Wastes (Lees) Liquid Recycling Plant
A recycling plant to produce safe and high quality cattle feed from alcohol distillation lees by solid-liquid separation, condensation, drying and purification. The photo shows the plant completed in Soo City, Kagoshima Prefecture.



Kitchen Garbage Recycling Plant for Cattle Feed and Fertilizing Compost “Templar M21”
Organic wastes such as kitchen garbage are recycled into high quality cattle feed and fertilizer by using “Tempura” principle.



Recycling Equipment for Car Wash Water
An equipment to purify the car wash wasted water containing wax etc. through a coagulation separation for recycling of water.

Environment & Recycling

Waste Treatment



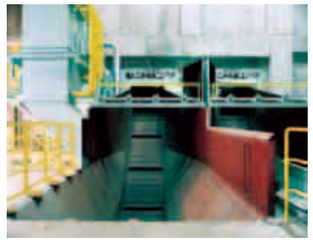
PCB Detoxification Plant

This plant detoxifies PCB (polychlorinated biphenyl) wastes safely and reliably. Photo shows the "Osaka PCB Detoxification Plant" for Japan Environmental Safety Corporation (JESCO).



Kiln Type Pyrolysis Gasification & Melting System “Mitsui Recycling 21”

Gasification and melting type waste treatment facility, where wastes are processed until melted ash in one line by the energy contained in the wastes. Wastes are roasted in the pyrolysis drum, and carbon and marketable items are recovered. The photo shows the West Hamamatsu Waste Treatment Facility.



Bulky Waste Treatment Facility

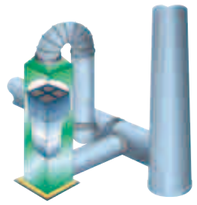
A system to recover useful metals such as iron out of bulky waste.



Heat Dechlorination Equipment “Diobreaker”

Dioxins in the ash are dechlorinated in this equipment by catalytic reaction of metals contained in the ash.

Gas Treatment



Catalyst for Decomposition of Dioxins “Diocatalyser”

A process to make an oxidative decomposition of dioxins in the exhaust gas through the three-way catalyst.



Dry Process Dechlorination System “Saulticle”

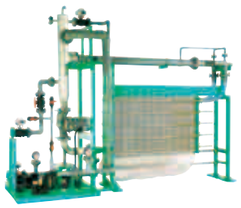
Epoch-making dry process dechlorination system to remove HCl (hydrogen chloride) and SOx (sulfur oxides) in the exhaust gas using Sodium series pharmaceutical agent (soda) with much higher efficiency than conventional slaked lime.

Water Treatment



Electro-osmosis type Dehydrator “e-Dynapress”

This dehydrator system is used in human excreta treatment plant and/or sludge recycling center, where ultra-low water content (less than 60%) can be achieved by this dehydrator.



Membrane Separator

A system which can maintain a stable amount of filtering water for a long time when installed at human excrement treatment facility, sludge recycling center, intermediate water supply system, etc.

Maintenance, Repair and Inspection Services



Maintenance Service

MES is offering maintenance service for rotating machine such as marine/on-land diesel engines, steam turbines, blowers, logistic/transportation machine such as cranes and construction machineries including their parts supply, maintenance, modification, repair, etc. The photo shows an up-grading work for a container crane.



Radar Detection Service

MES offers a radar detection service with a continuous measurement and checking of the inner crack, cavity, damage of reinforcement steel rod, rock pocket etc. of a concrete construction to make diagnosis for repair thereof.



Ship Repair

MES works for annual inspection, modification, running repair of various kinds of ships. The photos show a replacement of outer shell (left) and a propeller work (right).



Underwater Inspection and Investigation Service

MES offers inspection service for underwater civil construction such as dam, water gate, outlet facility, port/harbor structure in addition to sea-bottom investigation service, news coverage support service, surveillance service of underwater work by means of underwater vehicles.

Life, Amenity and Training



Guest House
Management of guest house in Oita Works.



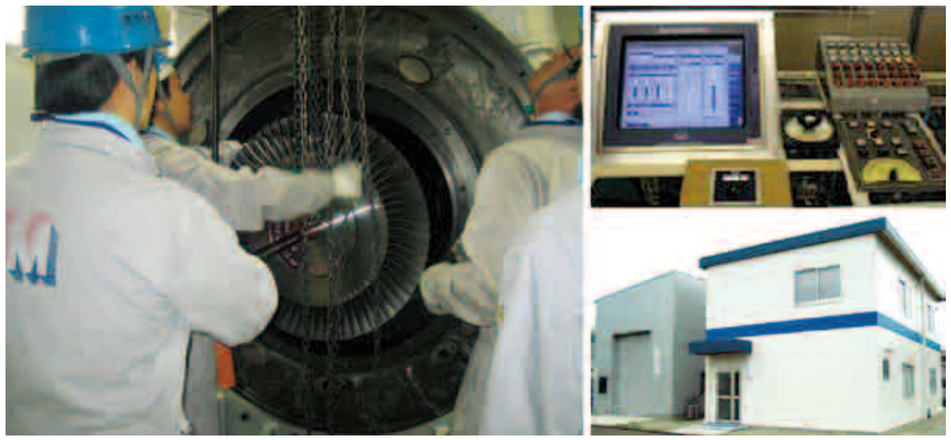
Car Driving School
Management of car driving school with the most modern training facility. The photo shows Suminoe Car Driving School. (Osaka)



Switching Swimming Pool to Gymnasium
A unique switching system to change a swimming pool to gymnasium by laying boards.



General Printing and Document Digitalization
MES offers general printing service including offset and on-demand printing, digitalization from hard copy, copying service, manpower dispatching, travel agency and other business support.



Training Course for Maintenance of Engines
MES manages a training course for ship's staff to enhance ability of maintenance of marine diesel engines inclusive of remote control and governor as well.

Works and Factories



Tamano Works

Area of site 1,028,000m²
Total Area of factories 373,906m²

<Major Products>

- Shipbuilding
- Power Plant
- Machinery for Land Use
- Ship Repairs
- Chemical Plant
- Others
- High-Speed Ship
- Marine Diesel Engine
- Offshore Project
- Machinery for Marine Use



Chiba Works

Area of site 859,000m²
Total Area of factories 223,000m²

<Major Products>

- Shipbuilding
- Ship Repairs
- Offshore Projects



Oita Works

Area of site 1,701,890m²
Total Area of factories 78,000m²

<Major Products>

- Steel Structures
- Transporting Machine
- Others



Yura Ship Repair Dept.

Area of site 142,000m²
Total Area of factories 11,000m²

<Major Products>

- Ship Repairs
- Shipbuilding Blocks



MITSUI ENGINEERING & SHIPBUILDING CO.,LTD.

http://www.mes.co.jp/english/

1412R120SBC