

MHI Receives Order for Six SGs from EDF

On August 24, Mitsubishi Heavy Industries (MHI) announced that it had received an order from Electricité de France (EDF) to manufacture six steam generators (SGs) for replacement use in pressurized water reactors (PWRs) located in France. This is the first time ever that a Japanese manufacturer will have supplied major equipment on a large-lot basis for use in French nuclear power plants (NPPs). It is also the first time ever that EDF has placed an order with an overseas manufacturer. The French utility took competitive bids for the replacement of 15 SGs in five different plants; the other nine SGs (three plants' worth) will be made by Framatome of France.

Each of MHI's SGs is approximately 21m tall and weighs a total of around 300 tons. Inserted in the interior of the pressure-resistant container, which is made of low-alloy steel (*1), are 4,000 or more heat-conducting tubes made of the brand-new material Inconel TT6690 (*2). Those are used to transmit the heat generated in the nuclear reactor from the primary cooling system (of the nuclear reactor) to the secondary cooling system (of the turbine). They thus serve as a core component of the PWR as it generates steam to power the turbine.

MHI's Kobe Shipyard and Machinery Works will be responsible for the production of the SGs, which will be handed over to EDF between 2009 and 2012. The on-site installation work is not part of the contract this time. According to EDF's future equipment upgrading plans, two PWRs (output 900,000kW each), which began operating in France in the 1980s, will have their SGs replaced.

Even before the current order, MHI was eagerly pursuing expanded markets for NPP equipment in the major nuclear power markets worldwide. It already boasts a record of having manufactured a total of 14 SGs for overseas clients, who include Tihange-1,2 and Doel-2 of Belgium, as well as San Onofre-2,3 and Fort Calhoun-1 of the United States. MHI hopes to use the latest order as a springboard to actively expand its market activities abroad, with emphasis on France.

**1. Pressure-resistant containers made of low-alloy steel: As the steam generator (SG) is subject to high pressure from the pressurized primary and secondary coolant water, the pressure-resistant container is manufactured with high-strength low-alloy metal (manganese, molybdenum and nickel steel).*

**2. Inconel TT690 alloy: Used as a material in SG heat-conducting pipes, Inconel is an innovative alloy of nickel, chrome, and iron that resists corrosion thanks to special heat treatment. It gives the pipes superior corrosion resistance under conditions of high heat and high pressure.*

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