Introduction of Clathrate Hydrate Slurry (CHS) Thermal Energy Storage Air-Conditioning System to California Steel Industries, Inc. in the United States

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JFE Engineering Corporation

JFE Engineering Corporation (JFE) has received an order for its Clathrate Hydrate Slurry (CHS) - Thermal Energy Storage Air-Conditioning System (CHS system) from California Steel Industries, Inc.(CSI), which is located east of Los Angeles, California (USA). CSI is the largest steel manufacturer on the West Coast. This will be the first implementation of the CHS system in the United States.

Since President Bush signed the energy bill passed by Congress last year, movements in the direction of energy conservation have been gaining ground rapidly in the United States, with the government, administrative agencies and the private sector acting in concert. In particular, because the State of California has experienced problems from tight power supply conditions in recent years, peak shift measures for daytime power consumption and energy saving measures are acquiring increasing importance in the state, and various concrete countermeasures are now being put in place. CSI has therefore taken the initiative in adopting the CHS system as an energy-saving technology, showing the lead to other influential local companies in this area.

The system is a latent heat-type thermal energy storage system that will provide air-conditioning for CSI's Corporate Office building (total area: approx. 75,300 square feet). Its potential energy-saving effect is estimated to be more than 30% as compared with the existing system. In the CHS system, the newly developed aqueous solutions play the key role for thermal energy storage in the cooling air-conditioning system, making it possible to store more than twice as much cooling energy as chilled water. High-density storage of thermal energy in a small-capacity heat storage tank takes place during night-time, and the stored cooling energy is utilized when the air-conditioning system is operated during the day. This not only realizes a peak shift in daytime power consumption, but also achieves energy saving with latent-heat thermal energy storage by allowing high-efficiency operation of the chillers at night when the ambient temperature is low. Related persons or organizations in various

fields can view a model facility of the CHS system that is expected to contribute to its full-scale market penetration and popularization in the United States.

The CHS system is a revolutionary energy-saving air-conditioning technology that was developed by JFE in collaboration with New Energy and Industrial Technology Development Organization of Japan. JFE is promoting introduction of the CHS system in commercial office buildings worldwide and is steadily expanding its record of sales. In Japan, the company installed the CHS system in the office building (186,200 square feet) of its Tsurumi Works in May of last year and is recording and analyzing operating data to verify the effect of system introduction throughout the year in order to ascertain and check the effects of its introduction. This research has already confirmed that the system achieves the targeted energy-saving effect.

JFE's CHS system has earned high evaluation in various field receiving, for example, the Prime Minister's Award in the "35th Japan Industrial Technology Awards" selected by the Nikkan Kogyo Shimbun (Japan's leading daily industrial newspaper). As a new energy-saving technology destined to spread throughout the world, the new system is expected to make an important contribution to achieving environmental goals such as reduction of CO2 emissions and prevention of global warming.

CSI Project (PDF 109kb)

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