

Construction and Operation Experience of Large Capacity DC Transmission System in Japan

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In a joint effort with Shikoku Electric Power and Electric Power Development, Kansai Electric Power has planned and worked toward the development of the “Kii-Channel HVDC project” to transmit electric power from Shikoku to Kansai area. That is considered the result of development about DC transmission system and that system have operated since in June of 2000. The equipment was capable of transmitting 250 kV DC power and the power transmission capacity reached 1400 MW. The final transmission capacity is 2 times that of first stage. Thus, it is the largest class of a DC transmission system in the world.

As to the technical development in this project, we developed large-capacity thyristor valve, 500kV DC submarine cable, 500kV DC GIS (Gas Insulated Switchgear) and DC overhead transmission line with new idea. They could contribute the highest level of DC transmission technologies. We will mention about the aim and accomplishments in this project. Owing these developments, it is enable to construct the highest reliable and large-capacity but low cost DC transmission system that links wide area.

Next, We will explain operation experience of DC transmission system. The equipment has been serving near maximum capacity since operation start. The operation factor of the DC equipment has exceeded 90%. We also developed a DC-system continuous operation control technology to minimize effects of AC system fault on reliability. Owing this system, it is possible to operate continuously even if AC voltage drops. DC submarine cable and overhead transmission line have been operated with no problem.

Finally, We will mention about the merits of DC transmission technology we developed that apply for power system in China. There is increasing of electric power demand according to economic development in China, and the most important subject is to construct the power system for stable supply. It could be possible to accomplish the high reliability and large capacity but low cost DC transmission system by these technologies as reinforcements in China.