

KSCE Upcoming Events

KSCE Board Meeting

Date: Tuesday, December 29, 2009 (5P.M.)
Venue: Hotel Renaissance, Seoul, Korea

The 58th Annual Meeting

Date: Thursday, January 14, 2010
Venue: Auditorium, Korean Federation of Science and Technology Societies, Seoul, Korea

ACECC 18th Executive Committee Meeting

Date: Sunday-Wednesday, February 21~24, 2010
Venue: Paradise Hotel, Busan, Korea

13th Civil Engineers' Day(2010)

Date: Tuesday, March 30, 2010
Venue: International Conference Rm., 2nd Fl., Construction Guarantee Center, Seoul, Korea

2010 KSCE Annual Conference & Civil Exposition

Date: Wednesday-Friday, October 20~22, 2010
Venue: Songdo Convensia, Incheon, Korea

Article

Brief Introduction of Construction for the Largest Sinwa Tidal Power Plant in the World

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Due to urgent request for reducing CO2 gas emission in years in accordance with the Tokyo Protocol, it is needed to develop alternative energy resources for the survival of the country in the near future. As Korea is surrounded by seas on three directions, it is abundant in oceanic alternative energy resources, such as tidal difference, current power, wave power and ocean thermal energy. Sihwa Tidal Power Plant is located in the middle of Sihwa tide embankment(11.2km). Its capacity of Sihwa tidal power plant is 254MW. The annual power generation is 552.7GWh, which is enough to supply household electricity to 500,000 residents. It is expected to reduce not only the import of 862,000 barrels of oil, but also CO2 emission of 315,000 tons a year. Above all, development of pollution-free, ocean-driven energy from a tidal power plant is expected to help Korea become less reliant on imported energy. As Being registered as a CDM(Clean Development Mechanism) project with the UN in 2006, it satisfies the policy of the government expanding alternative energy sources by acquiring Certified Emission Reductions (CERs), as well as complying with the United Nations' framework convention on climate change. All possible power generation types including ebb tide generation and double action on condition of management water level(EL.-1.0m) of Sihwa lake were reviewed. Finally, single action, flood tide generation type was chosen. The horizontal bulb type, Kaplan turbine was selected. It can make high efficiency generation on condition of small head and large capacity. And the structure base was planned to

rest on hard rock among layers to secure stability of structures. Structures consist of turbine generator structure, roller type watgate structure and connecting structure. 10 bulb type turbine generators and 8 roller type watgates are to be installed. 2 unit 1 block construction system is planned for efficient design to reduce thickness of structure. Given the need for the development of clean renewable energy by the Convention on Climate Change and the strong will of government toward green growth, it is a must to develop alternative energy resources for the survival of the country.

Sihwa tidal power plant is expected to be a cornerstone for Korea to be a leading country in ocean driven energy resource development.



Fig.1 Plane view of Sihwa tidal power plant

Table 1. Capacity and types

Output capacity	254MW(25.4MW × 10units)	
Annual output	552.7GWh(ΔEL-1.0m)	
Operation mode	Single action operation(during flood tide)	
Gate	8units(15.3m × 12m)	
Flow quantity	160G m ³ /day (50% of the lake water)	
Type	Turbine	Horizontal bulb type turbine
	Generator	Horizontal 3phase synchronous generator
Output	Turbine	26MW
	Generator	25.4MW
Runner diameter	7.5m(blade 3)	
Runner rpm	64.29rpm	
Discharge	482.13 m ³ /sec	

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