

Fish Reef Completion Ceremony "Application Study of Sulfur Concrete Technology in UAE"

On August 3, 2010, JCCP and the Marine Environment Research Center (MERC) of the UAE Ministry of Environment and Water held a ceremony at the JAL Hotel in the Emirate of Fujairah, UAE, to mark the completion of an artificial fish reef under the "Application Study of Sulfur Concrete Technology in UAE."

1. Project Overview

Sulfur is a refinery operation by-product that is available in surplus. This project aims to demonstrate how the application of this large supply of sulfur resources could be expanded, by creating sulfur concrete from sulfur, sand, and additives, installing artificial fish reef blocks and sewage pipes made of sulfur concrete on a trial basis, and examining their applicability in UAE. Compared to regular concrete, sulfur concrete is more salt resistant and acid resistant—properties that make it suitable for use as fish reef blocks and sewage pipes.

To examine the applicability of sulfur concrete to sewage pipes, a segment (approx. 80 m) of existing pipes in Al Ain, Abu Dhabi was replaced with sulfur concrete sewage pipes last January. The evaluation of its applicability is presently ongoing.

To examine the applicability of sulfur concrete as an artificial fish reef, sulfur concrete fish reef blocks have been installed off the coast of Umm Al Quwain

last June, and off the coast of Fujairah this February. After their installation, a large colony of pearl oysters and numerous schools of fish have been confirmed. With regular concrete fish reefs, the growth of algae and shells take time, because concrete is alkaline, but since sulfur concrete is practically neutral in alkalinity, algae and shell growth was observed soon after installation.

The fish reef blocks are being checked for any outflow of substances, and the impact of any such outflow on the environment is being assessed at a MERC laboratory. So far, no outflows to the sea or impact on fishes have been observed, and the safety of sulfur concrete has been confirmed.

2. Completion Ceremony

A ceremony marking the completion of the fish reef was held to present the proven effects of the fish reef and to introduce JCCP activities to UAE parties.



Mr. Morihiro Yoshida, Managing Director of JCCP, delivering a speech



Fish reef block covered with pearl oysters

The ceremony was held with the attendance of Dr. Ebrahim Al Jamali, Manager, MERC, Ministry of Environment & Water; Mr. Soliman Al Kadem, Head of Fujairah Fisheries Society, and others on the UAE side; and H.E. Mr. Tatsuo Watanabe, Japanese Ambassador

to UAE; representatives from participating Japanese companies Penta-Ocean Construction Co., Ltd. and JX Nippon Oil & Energy Corporation; and Mr. Morihiro Yoshida, Managing Director of JCCP, on the Japanese side.



Dr. Ebrahim Al Jamali, Manager, MERC, giving a presentation on future plans for the fish reef

Following a series of speeches by the guests of honor and sponsors of the ceremony, an overview of the project was introduced, and technical presentations were given regarding the installation status of the fish reefs and the results of ensuing observations. The participating Japanese companies and MERC assumed the role of giving the presentations, and used photos and videos to visually emphasize the effects of the installed fish reefs. This produced frequent questions and comments from fishery members and other UAE participants throughout the presentations, as an indication of their strong interest in the project. The participants also engaged in active exchanges of views while browsing photographs of the fish reefs displayed along the wall at the back of the room, before and during intervals of the ceremony.

3. Ripple Effects of the Project

The global balance of sulfur demand-supply continues to trend toward considerable supply excess. In fact, the



Exchanging views while browsing a wall of photos of the project

Middle Eastern countries as a whole produce sulfur in amounts exceeding demand by more than 4 million tons/year. At present, some 2.4 million tons of sulfur are produced in UAE refineries, but this volume is expected to increase to almost 6.5 million tons by 2015.

Even from a global perspective, sulfur production is steadily growing amid an increasing need to process heavier crude oil and produce lighter, low-sulfur fuels. Given this situation, the development of large-scale sulfur applications is extremely important to refinery management, and the application of sulfur to such structures as artificial fish reefs and sewage pipes offers a potential solution as a large-scale market for sulfur.

The fish reefs that were installed in this project are of minimum scale, and the sulfur concrete blocks composing each fish reef were made using approximately 100 tons of sulfur. However, since some fish reefs are almost 1,000 times larger in reality, sulfur usage would amount to some 100,000 tons per fish reef. Besides sulfur, sand and other aggregates can also be procured in UAE, so steady technical transfer to UAE through this project would enable the demonstration of sulfur concrete as a large-scale outlet for sulfur usage, as well as creating new employment in the country. There are thus mounting expectations of this project on the UAE side.

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