

**REPORT ON THE COOPERATIVE STUDY PROJECT
ON THE DEEPSEA MINERAL RESOURCES
IN
SELECTED OFFSHORE AREAS OF THE SOPAC REGION
(VOLUME 1-2)
SEA AREA OF
THE REPUBLIC OF KIRIBATI**

MARCH 2004

**JAPAN INTERNATIONAL COOPERATION AGENCY
JAPAN OIL, GAS AND METALS NATIONAL CORPORATION**

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PREFACE

In response to a request by the South Pacific Applied Geoscience Commission (SOPAC), the Government of Japan has undertaken marine geological and other studies for the understanding of the mineral resources potential of the deep-sea bottom in the offshore regions of SOPAC member countries. Implementation of the survey has been consigned to the Japan International Cooperation Agency (JICA). Considering the technical nature of geological and mineral prospecting studies, JICA commissioned the Metal Mining Agency of Japan (MMAJ) to execute the survey.

The survey is undertaken as the three-year Stage II Phase 2 Program started from the fiscal year 2003. This is the first year of the program, and the survey area is set within the Exclusive Economic Zone (EEZ) of the Republic of Kiribati.

The MMAJ dispatched the Hakurei Maru No.2, a research vessel designed for investigating deep-sea mineral resources, to the survey area from November 8 to December 5 (survey period: November 30, 2003 to December 3, 2003), successfully completing the survey as planned with the cooperation of the government of the Republic of Kiribati.

It is a pleasure to record our deep gratitude to all persons concerned, particularly to the staff of the SOPAC Secretariat, the Government of the Republic of Kiribati, as well as the Japanese Ministry of Foreign Affairs, the Ministry of Economy, Trade and Industry and the Japanese Embassy in the Republic of Fiji.

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ABSTRACT

The survey of year 2003 is the first year of Stage II Phase 2 Program started from the fiscal year 2003 and the survey of cobalt rich manganese crust (referred hereafter as cobalt crust) has been carried out for the sea area of 13,400k m² within the Exclusive Economic Zone (EEZ) of the Republic of Kiribati. The period of survey cruise was from November 8 to December 5 (survey period in the Republic of Kiribati: November 30 to December 3).

The cobalt crust survey in the Republic of Kiribati has, thus far, been carried out in three years, for three areas, covering sixteen seamounts, that is, in the fiscal year 1987 (in the area of the Phoenix Islands: 5 seamounts), 1989 (in the area of the Line Islands: 6 seamounts), and 1991 (in the area of the Gilbert Islands: 5 seamounts).

Of the above stated seamounts, the SE01 Seamount, situated 80 miles north of the Makin Atoll located at the northern end of the Gilbert Islands (latitude 4° 15' N, longitude 172° 54' E), is a composite seamount consisting of a group of seamounts and is expected to have high potential for cobalt crust. In the fiscal year 1991, acoustic survey and sampling survey were carried out for the largest seamount located in southeast area of the SE01 Seamount, however, the occurrence of cobalt crust was not confirmed. In this fiscal year, the survey, consisting of acoustic sounding survey by MBES and sampling by Arm Dredge (AD), was conducted in northwest area of the SE01 Seamount to understand the occurrence of cobalt crust. In addition to this, an environmental survey was conducted as a baseline study to understand environmental situation of present day for future evaluation of potential mining impacts on the deep-sea environment.

From the results of acoustic survey, it was clarified that the SE01 Seamount consisted of three seamounts including the one, Southeast Seamount, already surveyed in 1991. The two seamounts clarified by the survey of this year, Northwest and Center Seamounts, are flat-summit seamount, guyots, and they are connected by a col of 2,200m deep, and water depth of the two summits are 1,128m and 1,145m, respectively.

By the Sub-Bottom Profiler (SBP) survey, thickness of acoustically transparent layer of the summit of the Southeast Seamount was 150m thick, and for the Northwest and Center Seamounts it is, respectively, 20 to 50m thick and 20 to 70m thick, covering the whole area of summit to edge. The acoustically transparent layer on the summit was confirmed to be reflecting the foraminifer sand by Multiple Corer (MC) samplings at four sampling sites. The whole summit areas of the SE01 Seamount is represented by pale color on the MBES image, and this, also, suggests that unconsolidated sediments

cover the whole area of the summits.

For understanding the occurrence of cobalt crust, AD sampling was conducted at eight sampling sites, five at the northeastern slope of the Northwest Seamount, three at the northeastern slope of the Central Seamount. The sampling, however, resulted in collecting cobalt crust samples only at one site of 03SE01AD09 point in the Central Seamount (bottom touch depth of 1,910m), and average thickness and Co content of the collected cobalt crust are 35mm and 1.24%. The samples collected at other seven sampling points are limestone and pumice, and only thin manganese oxides (coating) were observed covering the surface of these rock.

Considering the results of the survey, there is a possibility of thick, high Co cobalt crust being distributed in the SE01 Seamount, but this was confirmed at only one sampling point. Therefore, the occurrence of cobalt crust in the SE01 Seamount seems to be local, not widespread over the whole area.

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