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THE IAEA '97 PACIFIC OCEAN EXPEDITION

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The International Atomic Energy Agency's Marine Environment Laboratory (IAEA-MEL) started in 1995 a five-year project "Research on World-wide Marine Radioactivity", generously supported by the Government of Japan. In the framework of the project, IAEA-MEL conducted the "IAEA '97 Pacific Ocean Expedition" to the NW Pacific Ocean from 21 October to 20 November, 1997. The objectives of the expedition were to provide new data on the current marine radioactivity in order to compare them with data sets obtained during national and international surveys at sites used for radioactive waste dumping or nuclear bomb testing in the NW Pacific Ocean and its marginal seas.

The expedition was organized in cooperation with Federal Maritime and Hydrographic Agency (BSH), Hamburg (Germany), Korea Ocean Research and Development Institute (KORDI), Seoul (Republic of Korea), Physical Research Laboratory (PRL), Ahmedabad (India), University of Linköping (Sweden) and five Japanese institutes : Japan Atomic Energy Research Institute - Mutsu Establishment (JAERI-Mutsu), Japan Chemical Analysis Center (JCAC), Japan Marine Science Foundation - Mutsu Marine Laboratory (JMSF-MML), Meteorological Research Institute (MRI) and Tokai University. Twenty two participants from the five Member States, including six staff members from IAEA-MEL, took part in the expedition.

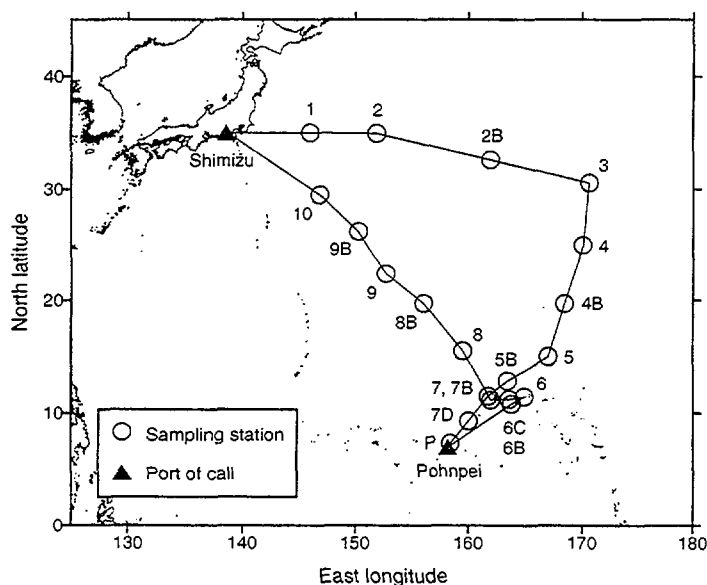


FIG.1 The route and sampling stations for the IAEA '97 Pacific Ocean Expedition.

The expedition was conducted using a research vessel 'Bosei Maru' owned by Tokai University. Fig.1 shows the route and sampling stations for the expedition. The route was in a triangular shape from Shimizu (Japan) eastward to Milwaukee Sea-Mountain (St. 3), then southward to the Marshall Islands (St. 6 and 7), calling at Pohnpei (The Federated States of Micronesia) and back to Shimizu. The sampling work in the NW Pacific Ocean was carried out at 20 stations, including 4 GEOSECS stations [1] (St. 2, 2B, 3 and 4) and 7 stations close to the Bikini and Enewetak Atolls (St. 5B, 6, 6B, 6C, 7, 7B and 7D).

Seawater samples were collected at several layers using large volume water samplers (LVS), submersible pumps and a CTD system with rosette multi-bottle samplers (CTD/RMS). Sediment and biota were sampled by a box corer and fishing rods/nets, respectively. CTD and general chemistry measurements were also carried out during the expedition. Table 1 gives samples collected and

measurements performed at each sampling station. In total the following samples were collected : 5 sets of large volume water samples with 7-10 depths, surface water samples at all the 20 stations, 12 sets of small volume water samples with 6-18 depths, 15 cores of sediment samples at 4 stations with 23-36 cm in length, 45 fish samples at 6 stations with 3 different species and plankton samples at 3 stations. Pre-concentration chemistry was carried out on board to reduce the volume of large volume water samples by a factor of about 20, so that the samples could be sent by surface freight from Shimizu to Monaco and to laboratories of the participating Member States.

TABLE I. SAMPLES COLLECTED AND MEASUREMENTS CARRIED OUT DURING THE IAEA '97 PACIFIC OCEAN EXPEDITION
(* C : CTD/RMS, L : LVS, W : SURFACE WATER, S : SEDIMENT, B : BIOTA)

Station	Date	Depth (m)	Sample*	Station	Date	Depth (m)	Sample*
1	23-25/Oct	5920	C, L, S	P	6/Nov	4240	C, W
2	26/Oct	6100	C, W	6B	9/Nov	-	W
2B	28/Oct	5920	C, W, B	6	9-11/Nov	4530	C, L, S, B
3	29-30/Oct	5470	C, L, B	6C	11/Nov	-	W
4	31/Oct- 1/Nov	5970	C, W	7B	11-12/Nov	3690	L
4B	2/Nov	-	W, B	8	13-14/Nov	5490	C, L, S
5	3/Nov	4860	C, W	8B	15/Nov	-	W
5B	4/Nov	-	W	9	16/Nov	5600	C, W, S, B
7	4-5/Nov	3500	C, W, B	9B	17/Nov	-	W
7D	5/Nov	-	W	10	18/Nov	6000	C, W

Preliminary results obtained by CTD and general chemistry measurements performed during the expedition are presented in a cruise report issued soon after the expedition by IAEA [2]. The full analyses of collected samples will be carried out by IAEA-MEL and Member States' laboratories including those of the participating organizations. The final results of all the analytical work will be published elsewhere.

In spite of the difficult weather conditions during the first half of the expedition (five typhoons crossed the sampling stations), the scientific objectives of the expedition were fulfilled thanks to the hard work and extra efforts of all participants and the ship's crew. It was the first time in the history of the IAEA that an oceanographic expedition to the open ocean was fully organized and accomplished by the Agency.

References

- [1] BOWEN, V.T. *et al.*, Earth Plan. Sci. Lett., 49, 411-434 (1980).
- [2] IAEA, IAEA '97 Pacific Ocean Expedition, 21 Oct. - 20 Nov., 1997, Cruise Report, R/V Bosei Maru, IAEA-MEL, Monaco (1997).