

DISTRIBUTION RESTRICTED

CRUISE REPORT

O.R.V. SAGAR KANYA

CRUISE – 231

(December 23rd, 2006 to January 04th, 2007)

**NATIONAL CENTRE FOR ANTARCTIC & OCEAN RESEARCH
(MINISTRY OF EARTH SCIENCES),
VASCO-DA-GAMA, GOA 403 004.**

REPORT ON CRUISE 231 OF ORV SAGAR KANYA

CONTENTS

1. Summary
2. Cruise track
3. Introduction
4. Itinerary
5. Cruise participants
6. Objectives
7. Work accomplishment
8. Performance of the Equipment used
9. Performance of the Ship
10. Loss Report
11. Conclusions
12. Recommendations
13. Acknowledgements

1. SUMMARY

The ORV Sagar Kanya cruise SK-231 sailed from Chennai on 23rd December 2006 and returned back to Cochin on 4th January 2007. These expeditions form a part of the Ministry of Earth Sciences programme. Ship sailed from Chennai towards PortBlair. Along ship track two Tsunami buoys were replaced which were not transmitting signals (Figure 1). NIOT scientist signed off at PortBlair (pilot station). On returned ship track in-situ measurements consists of CTD operation in one-degree interval from PortBlair to Cochin were performed. In total two Tsunami buoys are replaced and twenty one CTD stations (hydrographic parameter) operated (Figure 1) from 28/12/06 to 04/01/07.

2. CRUISE TRACK

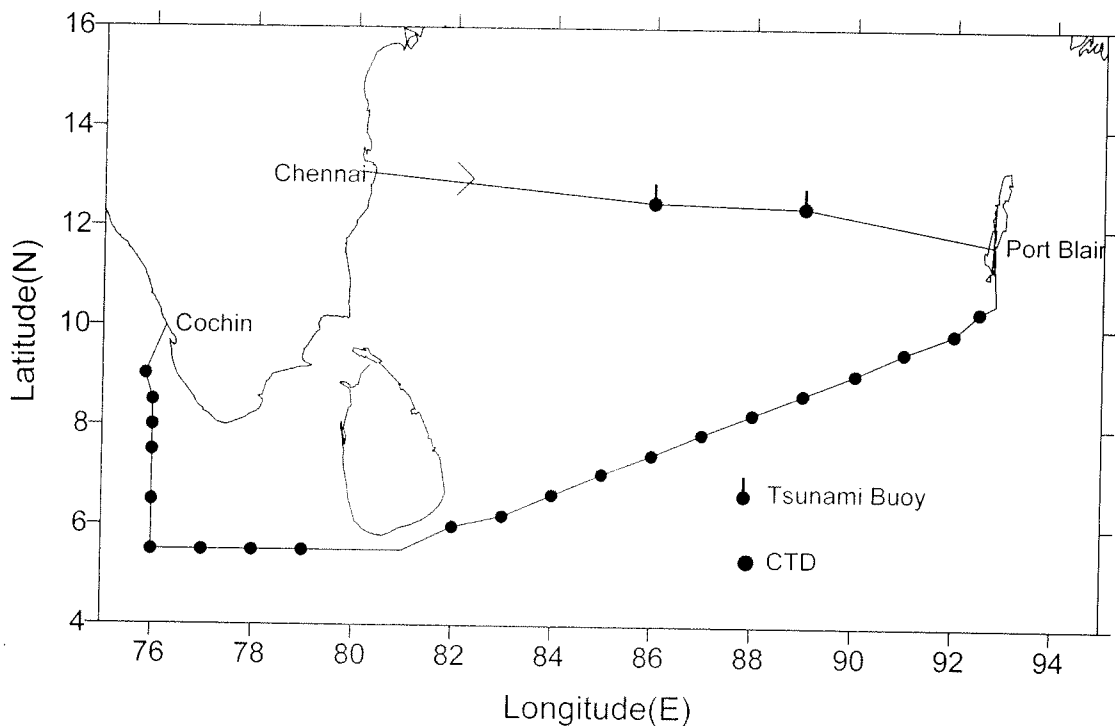


Fig. 1. Ship track during SK-231.

3. INTRODUCTION

The tsunami warning system consists of a Deep Ocean Pressure Recorder (DOPR) which is deployed on the bottom of the ocean and a surface buoy. The DOPR measures pressure data of the water column and transmits to the surface buoy using acoustic link. The surface buoy receives this information and relays to the shore station at NIOT campus at one hour interval. The DOPR detects the tsunami and send the data to surface buoy to be transmitted to shore station.

The buoys were deployed in the previous cruise onboard O. R. V. Sagar Kanya and R. V. Akademic Boris Petrov. Two of the buoys developed malfunctioning which is required to be serviced. The ship was sort from NCAOR especially to rectify these faults and put the systems into operation.

Ship sailed at 1800 hrs on December 23, 2006 for maintenance of two tsunami surface buoys deployed at TB8 and TB5 locations. The TB8 buoy was deployed at 12°30.75' N, 85°29.84' E on December 25, 2006. The TB5 was located at 12°26.2' N, 89°00.5' E. both the surface buoy needs to be replaced with new one with improved cable for the surface modem.

4. ITINERARY

Departure: Embarkation at Chennai on December 23rd, 2006

Arrival : Disembarkation NIOT at PortBlair (Pilot station) on Dec 28th, 06

Disembarkation NCAOR at Cochin on January 04, 07

5. CRUISE PARTICIPANTS

Scientific component:

Dr. Pednekar Shailesh,	Chief Scientist,	NCAOR
Mr. Abhishek Tyagi,		NCAOR
Mr. V. S. K. Rao,		NCAOR
Ms. Kamna V. Sahai,		NCAOR
Mr. Tata Sudhakar,	Dy. Chief Scientist,	NIOT
Mr. Rajahgopal Rooban Annamalai,		NIOT
Mr. Mani Saravanan,		NIOT
Mr. Pichamuthu Selvakumar,		NIOT
Mr. Manickavasagam Arul Muthiah,		NIOT
Mr. Punniamoorthy Ramesh,		NIOT
Mr. Stanly Maria Antony Prabahar,		NIOT
Mr. Solaiappan Alwar,		NIOT
Mr. Jesian Antony Irudayaraj,		NIOT

Non-Scientific component:

Mr. Biju V. Nair,	NORINCO
Mr. V. C. Sarathchandran,	NORINCO
Mr. P. Boopathy,	NORINCO
Mr. C. Balasubramaniam,	NORINCO
Mr. L. Nadukkandy,	NORINCO

6. OBJECTIVES

- Replacement of two malfunctioning tsunami buoy systems and to make them operational.
- Underway data collection along ship track.
- CTD operated along returned ship track.

7. WORK ACCOMPLISHED

Parameters measured

1. Temperature profile
2. Salinity profile

3. Sub bottom profiler
4. Gravimeter
5. Multibeam eco-sounder
6. Single beam eco-sounder

Instrument and machinery used onboard

1. CTD with Rosette
2. ADCP
3. AUTOSAL
4. Echo sounder
5. Seabeam – 3012
6. CTD winch
7. Thermosalinograph

8. PERFORMANCE OF THE EQUIPMENTS USED

Tsunami buoy operations

In all two tsunami buoys were replaced during the cruise at pre determined locations and the details are given in Table 1.

Table 1

Sr. No.	Date	Starting Time	Ending Time	Latitude	Longitude
1	28/12/06	2020	2115	12°29.00'N	086°00.00'E
2	29/12/06	0120	0210	08°15.00'N	088°00.00'E

Sea – Bird CTD opeartion

Sea-Bird CTD was operated in one degree interval from Port Blair to Cochin upto 1000 m water depth to collect hydrographic parameter such

as temperature and salinity profiles along returned ship track (Fig. 1). Data was collected during downcast and upcast. In all 21 CTD stations were occupied. The details of the CTD stations are given in Table 2.

Table 2

Sr. No.	Date	Starting Time	Ending Time	Latitude	Longitude	Depth (m)
1	28/12/06	2020	2115	10°19.95'N	092°29.98'E	0400
2	29/12/06	0120	0210	09°52.86'N	092°00.00'E	1624
3	29/12/06	0840	0950	09°29.00'N	091°00.00'E	3507
4	29/12/06	1645	1730	09°04.00'N	090°00.03'E	3007
5	30/12/06	0030	0130	08°39.07'N	089°00.00'E	3489
6	30/12/06	0815	0930	08°15.00'N	088°00.00'E	3617
7	30/12/06	1640	1735	07°51.00'N	087°00.00'E	3725
8	31/12/06	0015	0130	07°26.70'N	086°00.00'E	3779
9	31/12/06	0840	1015	07°02.00'N	085°00.00'E	3841
10	31/12/06	1620	1715	06°38.10'N	084°00.00'E	3926
11	31/12/06	2335	0130	06°12.00'N	083°00.00'E	3998
12	01/01/07	0655	0805	05°59.00'N	082°00.00'E	4061
13	01/01/07	1140	1255	05°30.00'N	079°00.00'E	3885
14	02/12/07	0530	0640	05°30.00'N	078°00.00'E	3379
15	02/12/07	1150	1250	05°30.00'N	077°00.00'E	2582
16	02/12/07	1811	1950	05°30.00'N	076°00.00'E	2278
17	03/12/07	0300	0400	06°30.00'N	076°00.00'E	1951
18	03/12/07	1150	1240	07°30.00'N	076°00.00'E	1565
19	03/12/07	1620	1510	08°00.00'N	076°00.00'E	1485
20	03/12/07	2020	2110	08°30.00'N	076°00.00'E	1050
21	04/12/07	0030	1320	09°05.00'N	075°51.00'E	0315

CTD Rosette

The CTD Rosette was used with 12 bottles for sampling purposes. Initially, few stations the bottle positions 1 & 3 were not triggering and subsequently repaired. Later rest of the stations Rosette could not operated for the collection of water samples.

ADCP operation

ADCP was not functional and hence could not collect underway current measurements.

AUTOSAL operation

The salinity from the conductivity sensor of onboard Sea-Bird CTD was calibrated with water samples collected at selected standard water depth and salinity estimated with the help of onboard Autosal. In all few samples were used to calibrate the CTD salinity with Autosal salinity. Autosal were working satisfactory.

Echo sounder operation

Single beam echo-sounder could not be operated continuously from Chennai to PortBlair since it was disturbing tsunami buoy signals.

Seabeam - 3012 operation

Initially multibeam system was not booting hence could not be operated but later it is rectified and system was working and collecting bathymetric data. Sometime sun workstation used to hang and multibeam used to stop working. We tried to rectified the problem and finally found that software executive file was corrupted.

CTD winch operation

Winch was operational satisfactory during CTD operation. Roller was replaced in order to protect CTD cable.

Thermosalinograph operation

Thermosalinograph was not functional and hence could not collect underway temperature and salinity measurements.

9. PERFORMANCE OF THE SHIP

In general, the shipboard machinery and equipment worked satisfactorily except ADCP and SVP but the major problem encountered with air conditioning system.

10. LOSS REPORT

NORINCO engineers located stings of CTD cable due to rusting at 650 m and 950 m cable length hence discussed with the Captain and Chief Officer onboard and decided to cut the CTD cable at two locations.

11. CONCLUSIONS

Data collected at all the planned stations

1. Tsunami buoys were replaced.
2. CTD stations were operated in one degree interval on returned track
3. Underway data collected.

12. RECOMMENDATIONS

Unable to make any underway current measurements using ADCP as it was not functional. Seabeam 3012 could not work as required for survey

proposed in block located near river channel. Rossete samplers are not triggering for water samples. Thermosalinograph also needs reparation.

13. ACKNOWLEDGEMENTS

Master, Chief Engineer, Chief Officer, all the other officers as well as the entire shipboard personnel from deck, engine and catering departments cooperated very well to make this cruise a great success. The chief scientist and the entire team record their appreciation for this co operation.

Similarly, the NORINCO Engineers extends their technical support whenever required.

The constant encouragement by the Director, NCAOR, and the excellent logistical support extended by Dr. M. Sudhakar and NCAOR team is greatly acknowledged