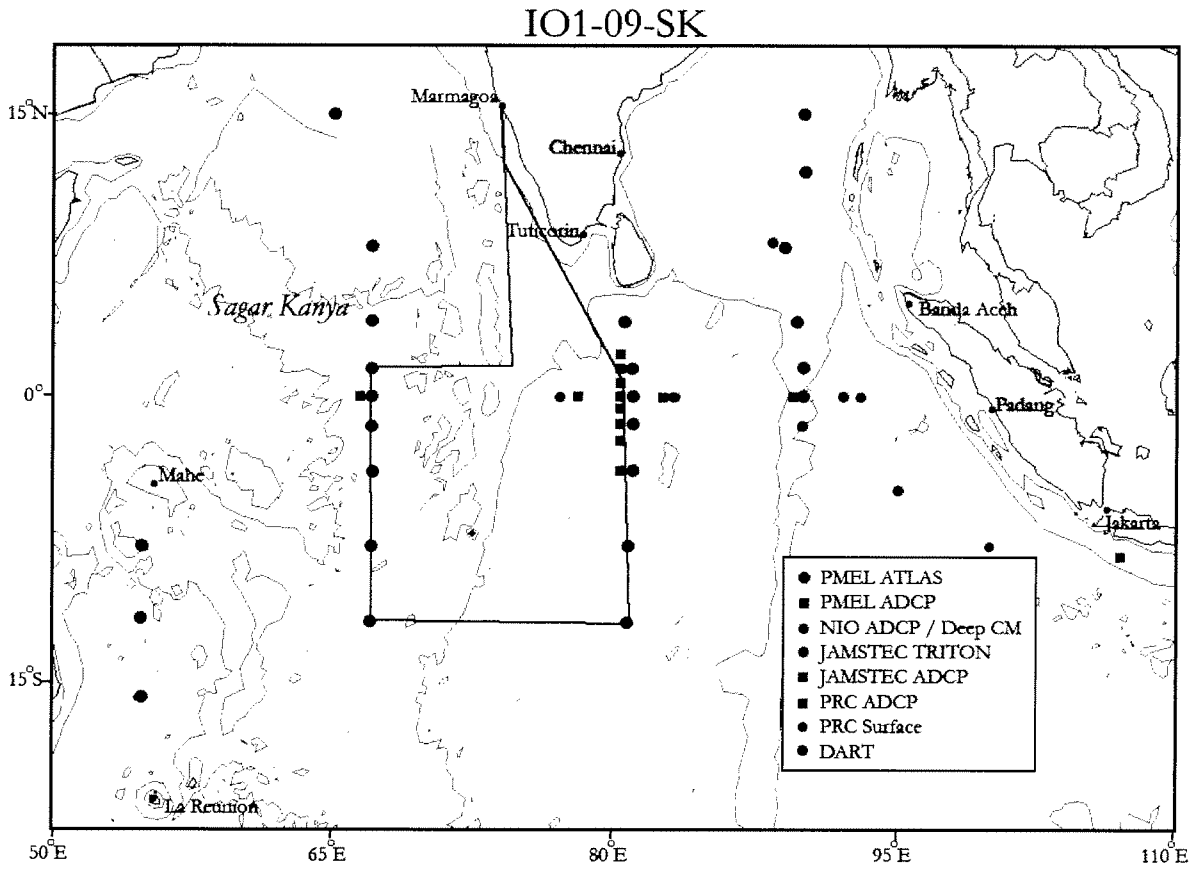
SK-259 Cruise

Objectives:

1. Retrieval and Deployment operation of RAMA Moorings (INCOIS-PMEL-NOAA) at Indian Equatorial Region maximum up to 12 South Latitude with 80.30E & 67.00 E Longitude.
2. Collecting marine meteorological parameters along with the ship routes and CTD operation with Water Samples Collection up to 2000m After Every Buoy Deployment
3. Deployment of Surface Drifters (NIO) to observing SST and deploy XBT at every 2 degree Latitude position from Goa
4. Deployment of Indian **ARGO** Apex Floats(INCOIS) for observing the Ocean Parameters.

Planned Cruise Track



Participants List SK-259

	Name of the Participants	Designation	Organisation
1	Mr. Suresh Kumar.N	**Chief Scientist**	INCOIS
2	Mr. Shepherd Andrew James	**Dy. Scientist**	NOAA-PMEL
3	Mr. Smith Stephen Alen	Scientist	NOAA-PMEL
4	Mr. Manu Tambhi	JRF	NIO-Goa
5	Mr. Anand Joshi	Ph.D Student	JEM College
6	Mr. Selvaraj Venkatesan P	Seaman	INCOIS
7	Mr. Subbarayan Dhayalan	Seaman	INCOIS
8	Mr. Biju Vikraman Nair	Manager Tech.	NORINCO
9	Mr. Pallikkara Paul Raigon	Service Engineer	NORINCO
10	Mr. Madar Parshuram Durgappa	Service Engineer	NORINCO
11	Mr. Yerramilli Krishna Chaitanya	Service Engineer	NORINCO
12	Mr. Sameer Shaikh	Ship Assistant	NCAOR
13	Mr. Vijay Paramar	Ship Assistant	NCAOR

Dairy of Events:

05-May-2009, Day 1

- Vessel got Birth at 19.00 Hrs. in Marmugoa Port, Goa. And Sign On of all Participants at 22.00 Hrs was completed.
- Birthing is been allotted for very less much of time after long issues from Port, so we have started loading the NOAA-PMEL,INCOIS and NIO Stuffs onboard
- Accommodations for All Scientist were done @ 23.30 Hrs.

06-May-2009, Day 2

- Pilot came onboard and Vessel moved to Anchorage @ 4.00 Hrs. we stopped loading the stuffs.
- Vessel at Anchorage, we continue our loading works with some small boats from Goa Port to Sagar Kanya
- Afternoon 14:00 Hrs Sea Became very Rough, we cease the loading operation an plan to proceed next day early morning
- Mr. Manu Tambhi from NIO (GIO) met me to discussed about the Operation of XBTs and Drifter and Collecting Ocean Met Data

07-May-2009, Day 3

- Myself and our two seaman and ship deckhands got up so earlier 04:00 Hrs. and we are waiting for the first boat service. the first boat arrived @ 05:30Hrs then we have started loading
- During the loading one of the small boat got massive hit and the some wooden parts of the ship had damaged while lifting the heavy weight Anchors (5 Tone) that time seas are very rough and more n more big swell.
- We have done stacking of NOAA Buoys and many more stuffs on board.
- Due to technical defect in ARGO floats we have stopped ARGO deployment programme in SK-259 cruise.

08-May-2009, Day 4

- The last boat arrived on time 05.30Hrs with lots of Stuffs. We finished all loading works and completed the stacking. This is very risky job we done onboard it's quite difficult job but we don't have other choice.
- Captains wants to latching for all stuffs kept onboard for safety and it's done with ship deckhands.
- Vessel soiled out @ 11:40Hrs, from Anchorage.

09-May-2009, Day 5

- 11:30Hrs we have meeting with Skipper, Chief Officer and Engineer and all Scientists onboard and Norinco Engineers in conference Hall.
- Meeting regarding for how to recovery and deployment of NOAA Buoys and ARGO floats and Drifters and CTD operation with water samples collection...
- 14:00Hrs, NIO Drifter 6 nos. was kept at Deck for pre-testing the Communication.
- 16:00Hrs Ship safety drills were conducted for emergency situation in Ship.
- 19:00Hrs, we opened and inspect the INCOIS CTD System its came with 14 Boxes but unfortunately we missed one (9 of 14) Box instead of that the Agent supplied the wrong one.

10-May-2009, Day 6

- NOAA winch fixed in the Deck and power supply given by NORINCO engineers and also welded.
- Nine Buoys CPU tubes are fixed in the railings and Data log were carried out at Muster station.
- Vessel approaching to our first location 1.5 N / 80.30 E (Lat/Long)

11-May-2009, Day 7

- First XBTs operation done by Mr. Manu Tambhi, later on we deployed Two SST Drifters [id no. 93504 & 92628]
- Mr. Steve from NOAA, he fixed the Honda Motor to them small boat to get ready for recovery operation

12-May-2009, Day 8

- Vessel got arrived our First location 1.5N/80.30E (Lat/Long). Mr. Andy and Steve were started to communicate with Acoustic release which tie with anchors through deck unit system. It's an acoustic command system. Vessel been drifting for while operation. During Acoustic operation there will be no underwater noise even Echosounder single beam and multi beam, so we stopped all Acoustic onboard.
- The slant range showed ~8000 meters length between release and deck unit head we asked to bridge to move near to the Buoy approaching site. Its takes whole day so we are plan to do next day morning for recovery
- @ 10:30Hrs we have started the Dummy test for CTD system Idronaut with water sample bottles. Up to 2000 meter depth this is for tightening the wire rope.

13-May-2009, Day 9

- @ 06:00 hrs Sagar Kanya vessel approached to the same site location 1.5N/80.30E (Lat/Long) again and we given release commands to acoustic release which hold anchors. After getting acknowledgement signal from release. One of our seamen seen the buoy on surface its far distance from Port side aft of the vessel also the buoy it's free from anchors so its start drifting slightly.
- 12:30hrs buoy at position of 1°40N/080°36E. Later the buoy wire rope was reported at 14:00hrs to be taut while heaving with the athwart ship jib boom. The vessel was experiencing a steady 20 knots wind and swell.
- During the retrieval of buoy the mooring wire rope lead to starboard beam and got entangled with propeller or rudder while heaving rope onboard.
- Its observed that buoy wire rope which was around 8mm leading under the ship bottom and was getting tight while heaving then later its cut and slipped in to water and then we conform that the buoy wire rope was fouled with propeller
- The loose wire end from the starboard side which is approximately ~40mtrs long could not be retrieved on board due to the big swell

14-May-2009, Day 10

- After had discussion with SCI , NCAOR the ship was headed to Tuticorin for inspection and repair.@ 0rudder
- @ 09:30hrs vessel moving to Tuticorin port

15-May-2009, Day 11

- @02:30 hrs in position of 02 degree 36.7minutes N 081 degree 03.7 minutes E the starboard side buoy wire got dislodged and cleared from ships bottom
- Along with rope a sensor was connected we retrieved both together onboard

- An inspection with ship people and onboard scientist and conformed that no more wore in ship bottom.
- Vessel resumes to scientific expedition.

16-May-2009, Day 12

- Vessel arrived again the same location for deployment of new ADCP single ball moorings at 10:00hrs (1.5N/80.30E)
- @11:30hrs we successfully deployed the ADCP Ball to water. That time depth around 4500mtrs.
- @14:45hrs Anchors were deployed and we completed one mooring operation
- Then one hour delay after we lower CTD (Idronaut) up to 2000mtrs depth the cable pay out gone to 3500mtrs for approached 2000 meters because of more sub water current in Indian Ocean equatorial region.
- @10:00 vessel moved next location

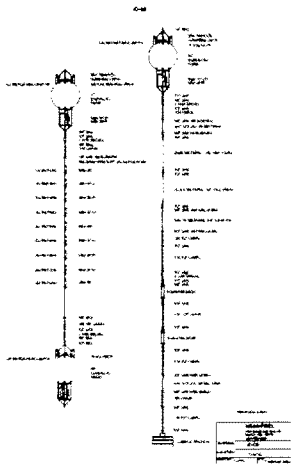
17-May-2009, Day 13

- Ship approached the site but due to Sunday no one crew want to do work afternoon Sunday... so we skipped our skejool to do next day early morning.
- We plan to recovery two balls ADCP which deployed last August on Sagar Nidhi.
- Due to shallow water the top ball of ADCP came to surface and visually it can be seen.
- Vessel stopped and drifted

18-May-2009, Day 14

- On arrival at the nominal Mooring location of 0.58N, 83E the subsurface mooring position was visually identified by floats on the surface and by signals from the acoustic releases that are attached to the anchor at ~4500 m depth. Recovery operations commenced in the morning of May 18th a release command was sent to the acoustic releases and a confirmation was received that the mooring was free from its anchor. The top and bottom floats were visible on the surface. The floats are separated by an ~200 meter piece of 5/16" jacketed wire with 9 sensors distributed along it.

- <u>Mooring diagram</u>



- A hauling line was rigged through blocks on the jib-boom located amid ship on the starboard side. The ship approached the top float on the starboard side at about 50 meters distance. A small inflatable boat was deployed to tow the working line to the float. Once the working line was attached to the float it was brought to the ship using a winch. As the line was being brought to the ship the 2nd float was slightly aft of the starboard beam. The float was brought on board, disconnected from the mooring line and, the hauling line attached to the mooring line
- We began to haul in the mooring line. While the line was being brought aboard the 2nd float and the wire leading from the jib-boom began to lead aft. The bridge was notified of the wire angle. We were told to bring the line in faster. The line eventually led directly aft. The captain turned on the screws (propeller) bringing the mooring line into the screws and becoming tangled in the starboard propeller. The section of wire leading from the starboard Jib-boom to the stern parted. It was obvious at that point that the wire had been tangled with the screws by the distorted and damaged wire from the broken section brought aboard the ship. The wire tangled in the ship's propellers and still connected to the 2nd float (and the rest of the mooring) was leading aft of the ship. It was also apparent the 2nd float was still connected to the ship by the wake of the float and the tensions on the wire leading to the float.
- The decision was made to bring the float aboard the ship. The small boat was used to attach the working line to the float. While examining the float they noticed that a large amount of fishing line attached to the mooring line below the float. To minimize risk to the ship the decision was made to cut the mooring line from the float. A hauling line was attached to the float and the float was brought aboard the ship. The wire from the top of the float leading to the starboard propeller was disconnected from the float and led by hand to the stern where most of the instruments were recovered and the remaining wire was secured. It was noticed a section of the mooring wire was still attached to the ship and leading aft

- <u>Total Losses of two occurrences</u> :
  4 ea. Edge Tech Acoustic Releases
  4 ea. Seabird Temperature Sensor
  ~8000 meters of Vectran/Kevlar line

- When trying out port and starboard engine on turning gear observed that the port engine turning gear motor current reading was normal at 3.2 amps, while starboard engine on turning gear was showing starting current on 3.2 amps and suddenly shoot to high current
- Skipper and chief engineer suspect that starboard propeller shaft to be fouled with buoy wire and fishing ropes/lines
- @20:35hrs vessel was diverted to port of refuge Tuticorin to clear the starboard propeller shaft which is entangled with buoy wire & to inspect for any damage.

19-May-2009, Day 15

- After head word with Mr. Andy and Mr. Steve we have skipped all our operation in SK-259 Cruise. Plan to continue next cruise
- Planed to do offloading the NOAA + INCOIS Stuffs on Tuticorin port.
- Awaiting of arrival on Tuticorin port
- Message from Captain said the ETA of Tuticorin must be 27-may-09.

20-May-2009, Day 16

- Vessel proceeding to Tuticorin
- NOAA packing their materials.

21-May-2009, Day 17

- Vessel stream to Tuticorin port

22-May-2009, Day 18

- After four days we seen beautiful sunny and clear skies
- Vessel proceeding to Tuticorin

23-May-2009, Day 19

- @16:30hrs safety fire drill were conducted onboard

24-May-2009, Day 20

- Vessel proceeding to Tuticorin

25-May-2009, Day 21

- Vessel propelling to Tuticorin

26-May-2009, Day 22

- Vessel propelling to Tuticorin
- Small meeting were conducted in officer recreation room

DEPLOYMENT DETAILS OF DRIFTERS in SK 259 CRUISE

LAT	LONG	DATE	TIME	ID NUMBERS
4^0 00'N	80^0 43'E	13/5/09	17:45	93504,92628
$0^0$36'N	83^0 08'E	14/5/09	21:30	93505,92629

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SL No	Equipment operated	Date	Time(LT)	Latitude	Longitude	Depth	File Name	Remarks
1	XBT	09.05.2009	15.3	11° 00.00 N	074° 49.00 E		T7_00005.rdf	
2	XBT	09.05.2009	21.22	10° 06.00 N	075° 07.00 E	2000 M	T7_00003.rdf	
3	XBT	10.05.2009	3.51	09° 03.00 N	075° 32.00 E	360 M	T7_00004.rdf	
4	XBT	10.05.2009	9.15	08° 01.00 N	076° 00.00 E	1468 M	T7_00007.rdf	
5	XBT	10.05.2009	18.1	07° 00.00 N	076° 43.00 E	1988 M	T7_00008.rdf	
6	XBT	11.05.2009	1.01	06° 01.00 N	077° 25.00 E	2366 M	T7_00009.rdf	
7	XBT	11.05.2009	10.04	**04° 44.00 N**	078° 18.00 E	3500 M	T7_00010.rdf	
8	XBT	11.05.2009	17.2	03° 43.37 N	079° 00.96 E	3500 M	T7_00011.rdf	
9	XBT	12.05.2009	05:52	01° 59.93 N	080° 13.52 E	3500 M	T7_00012.rdf	
10	XBT	17.05.2009	06:20	01° 01.00 N	082° 00.00 E	4500 M	T7_00013.rdf	
11	XBT	18.05.2009	21:50	00° 36.40 N	083° 07.00 E	4500 M	T7_00014.rdf	
12	XBT	21.05.2009	12:15	03° 07.08 N	081° 28.47 E	4500 M	T7_00015.rdf	Profile up to 262 meters depth.

27-May-2009, Day 23

- **Vessel arrived at Tuticorin port and anchored at 10:30 Hrs,**

28-May-2009, Day 24

- After berth meeting we have Doc on tomorrow morning @ 6:00 Hrs.

29-May-2009, Day 25

- Vessel got birth @ 17:00Hrs. but vessel placed at Port Alongside I request Skipper to change to Starboard side for offloading the Stuffs very easy by using National oil level crane and skipper replied when clearing Wire rope from propeller we can change it very soon

30-May-2009, Day 26

- Today all scientist peoples except two foreigners were finished signed Off and remain formalities
- Mr. Andy and Mr. Steve still onboard

31-May-2009, Day 27

- Vilshipping Arranged 12 Trucks and vehicles arrived today for shifting stuffs from Tuticorin port to Chennai NIOT Campus.

01-June-2009, Day 28

- New scientific team arrived inboard
- Vessel moved to Anchor after getting port instruction

01-June-2009, Day 29

- Arranged small Tugboat and bought two foreigners on shore and cleared all formalities they were signed off

N. Suresh Kumar
Chief Scientist SK-259
INCOIS