

DEPLOYMENT OF SAIC-TSUNAMI BUOY STB1 IN BAY OF BENGAL

STB1 DEPLOYMENT REPORT

ORV SAGAR KANYA – SK271

20th – 29th April 2010

Chennai to Chennai



OOS, NIOT
Chennai



ASG, INCOIS
Hyderabad

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ORV SAGAR KANYA CRUISE REPORT –SK271

CRUISE SUMMARY

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1. OBJECTIVES OF THE CRUISE

- Deployment of SAIC-Tsunami Buoy – STB1 at Bay of Bengal which is a joint programme between NIOT and INCOIS.Hederabad.

The Sagar Kanya cruise 271 was undertaken to establish and deploy the SAIC-Tsunami Buoy – STB1 at Bay of Bengal which is a joint programme between NIOT and INCOIS.Hederabad. This system will be part of Indian Tsunami warning system.

2. LIST OF PARTICIPANTS

1. NIOT Staff Details:

#	Name	Designation
1.	<i>Srinivasan</i>	Scientist-C
2.	<i>Thirunavukkarasu</i>	Technical Asst.
3.	Edwardsdurai	Technical Asst.
4.	<i>Tamizhmugilan</i>	Technical Asst.
5.	<i>Ramesh</i>	Skilled Asst.

2. INCOIS Staff Details:

#	Name	Designation
1.	<i>Ajaykumar</i>	Project Scientist
2.	<i>Ravichandra</i>	Project Engineer

3. SAIC Team List: SAIC, USA.

#	Name	Designation
1.	<i>JACK MACGREGOR</i>	Electrical Engineer
2.	<i>Christopher Bruce ZIRKLE</i>	Deployment engineer

4. Seaman Details:

#	Name	Designation
1.	<i>Rajasegar</i>	Seaman
2.	Aridass	Seaman
3.	Rajapart	Seaman
4.	Pradeep	Seaman
5.	<i>Murali</i>	Seaman
6.	Govindu	Seaman
7.	Sridhar	Seaman
8.	Sakthivel	Seaman

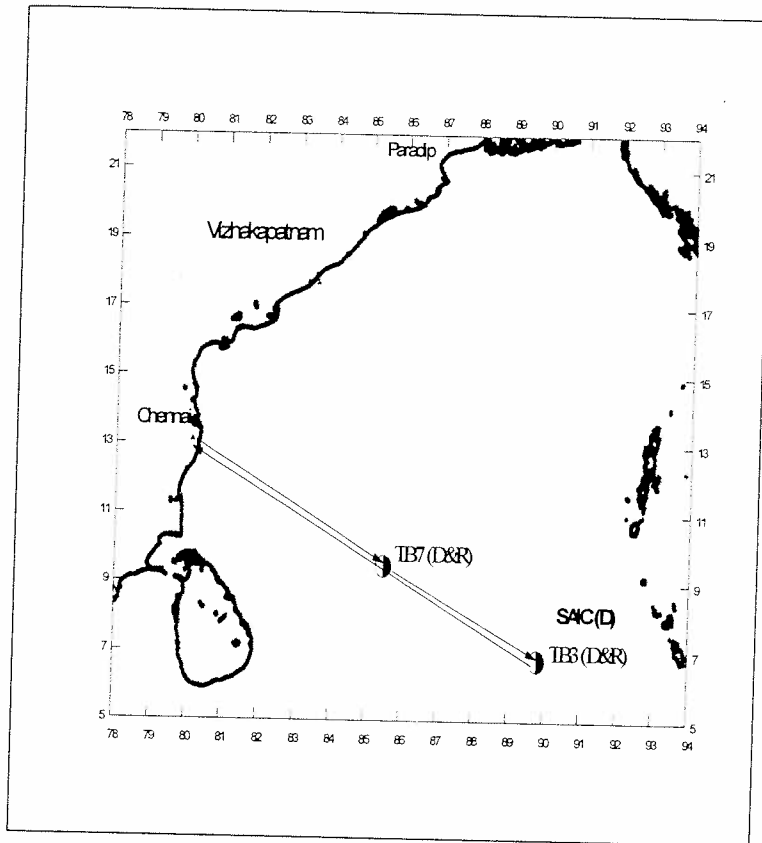
3. CRUISE TRACK

OCEAN OBSERVATION SYSTEM

(National Institute of Ocean Technology, Ministry of Earth Sciences, Govt. of India.)

Bay of Bengal – SAIC Tsunami buoy Deployments/Retrievals

Onboard Sagar Kanya – Cruise III -commencing on April 18, 2010



Total cruising distance : 1512nm
 No. of deployments : 1 SAIC
 Total cruise time (aprox) : 9 Days
 @ 10knots

BUOY ID	LATITUDE (° N)	LONGITUDE (° E)	Depth (m)
TB3	06° 39' 24"	89° 49' 24"	3043
TB7	09° 25' 28"	85° 30' 22"	3675
SAIC	07° 00' 00"	90° 00' 00"	3043

4. List of materials handled for SK271 cruises

Sl. No.	Item Description	Quantity	Make/Model	Weight in kg	Amount in Rs.
1.	Acoustic Release Tool	1 set	ORE	1	225/-
2.	Bags TY-Raps,Black, 8.5"	1 set	-	0.1	100/-
3.	Bags TY-Raps,Black, 14"	1 set	-	0.1	100/-
4.	Acoustic Release Manual	1	ORE	0.1	200/-
5.	Sheet Silicone Rubber	1	-	0.2	100/-
6.	Can Orange Sorbead	1	Sorbead	0.4	200/-
7.	Tube DC 4	1	Dow corning	0.1	200/-
8.	Electrical tape	1	3M	0.1	500/-
9.	Desiccant Packs	12	-	0.1	200/-
10.	Tube Aqua Shield	1	Aqua shield	0.2	325/-
11.	DB-25 Data Kit for Iridium Modem	1 set	NAL Research	0.1	525/-
12.	Spare Anchor Link/Jaw End Fitting	1	-	1	1500/-
13.	Spare BPR Anchor	1	-	320	50,000/-
14.	Deployment Tools	1 set	-	20	5,000/-
15.	Recovery Poles and flags	1 set	-	3	750/-
16.	Deployment Sheave	1	508	22	75,000/-
17.	Wooden Box	1	SAIC	85	1,500/-
18.	BPR mooring & floats	1 set	SAIC/Benthos	100	5,000/-
19.	Trolley	1	NIOT	125	20,000/-
20.	Wooden Pallets	6	-	4	2,400/-
21.	Handling rope Metal Spool Stand & Pipe	1 Set	-	75	2,100/-
22.	Weight Keeper	1	-	50	1,000/-
23.	Gemini Craft Boat With Engine & petrol	1 Set	NIOT	45	1,500/-
24.	Nil spin Reel	1 Set	SAIC	100	3,000/-

5. Dairy of Events:-

Date of Event	Events executed
20/04/2010	Materials/equipments belong to NIOT & associated with SK270 was off loaded to the trucks by 2-4 PM. Appeared for Immigration check and boarded the vessel by 6 PM
21/04/2010	Coordinated with M/s. Balmer & Lowrie and M/s. Joans p Shipping company for fast custom clearance of SAIC –STB items. Items was loaded in to the vessel by 10 PM Assembly/Integration/Testing of surface buoy started by 11 PM
22/04/2010	Testing of BPR systems in integration with Surface buoy was done and data reception from the INCOIS Rudics was confirmed by 2 AM Sailing started from Chennai port by 3:30 AM
23/04/2010	Material rearrangement was done in the deck for easy movement by 11 AM The total surface buoy & BPR system put in continuous dry test for data transmission & reception was confirmed thro' INCOIS Rudics by SAIC Deployment Team. Detailed discussion on deployment procedure had with Master, Chief Officer, Chief Engineer & SAIC deployment team by 5 PM
	It is decided to deploy <ul style="list-style-type: none"> • The SAIC surface buoy using the ATLAS crane & Anchor drop by National Oil well crane. • BPR floats by A-Frame Side and BPR by using National Oil well Crane
24/04/2010	Moorings made ready for easy deployment by 2 PM Pre deployment meeting conducted with Master, Chief Officer, Chief Engineer & SAIC deployment team and finalized the deployment sequence to be followed & the safety measures to be adhered during the actual deployment SAIC buoy & BPR countdown started and functionality of all sub systems of system like Marker Lamp, Acoustic Release, Acoustic Modem, BPR & Tilt sensor & Paro scientific pressure sensor and batteries was tested.

Date of Event	Events executed
25/04/2010	Reached the buoy location by 6 AM
	Multibeam Survey carried out to have idea about the topography & profile of the location
	Ship traffic at the selected location was noticed and informed to the project Manager and also it is suggested to have different traffic less location for the longer sustainability of buoy. 8-9 AM
	It was decided to move 10-15 nm north from the previous location selected.
	Reached the location (6.25 N & 88.8 E) by 11 AM.
	Multibeam Survey carried out to have idea about the topography & profile of the location and the depth noted of 3840 m. 1 PM
	Deployment of SAIC surface buoy started by 1:10 PM
	SAIC surface buoy successfully deployed at around 5:30 PM
	Buoy positioning sequence was watched from 5:30 to 6:45 PM
	BPR mooring arrangement was made ready for deployment by 9 PM
	BPR system was successfully deployed by 10:30 PM
	BPR residing sequence was watched & linkage between BPR and surface buoy was ensured.
26/04/2010	BPR position at seabed with respect to surface buoy location was ensured thro' Triangulation measurement and completed by 2:30 AM.
	Started sailing towards Chennai by 6:30 AM
	Safety drill was conducted by Master and all are participated by 4:30-5 PM
27/04/2010	Cruise balance materials/equipments was packed & made ready.
	Sign off request along with material off loading list was sent to NCAOR.
28/04/2010	Technical info sharing meet conducted with SAIC deployment team
	Deployment report prepared & signed by representatives of SAIC team leader & Chief Scientist.
29/04/2010	Reached Chennai port by 12 AM
	Disembarked by 3 PM

6. DEPLOYMENT OF SAIC-STB1

Deployment details:-

Buoy Location:

Latitude : 06.25 N (06° 15' 00'')
Longitude : 88.88 E (88° 48' 00'')
Depth : 3793 m

SAIC BUOY ACCESSORIES

The following devices are fitted with SAIC buoy mechanical assembly.

Primary Accessories & Secondary Accessories

1. SAIC Buoy- CPU - 2 Nos
2. Acoustic Modem - 2 Nos
3. Iridium Satellite transmitter - 2 Nos
4. GPS Receiver & Antenna - 2 Nos
5. Battery Packs (Alkaline & Lithium based) - 2 Nos
6. Nitrogen Neutralizer - 1 No
7. Desiccant (moisturizer remover) - 1 No
8. Radar Reflector. - 1 No



**APPENDIX 10
CUSTOMER ACCEPTANCE OF SAIC TSUNAMI BUOY (STB) SYSTEM**

CUSTOMER / CONTRACT: Indian National Center for Ocean Information Systems

SYSTEM ID: IN 1

LOCATION: Bay of Bengal 8.25 N 88.5 E

CONFIGURATION SHEETS FOR BPR AND BUOY ATTACHED: YES / NO

Acceptance			
ACCEPTANCE AGREED:			YES / NO
SAIC Representative:	Print: <u>Sudhakar</u>	Date: <u>29/04/10</u>	
	Sign: <u>[Signature]</u>		
Customer Representative	Print: <u>R. Sankaranarayanan</u>	Date: <u>29/04/10</u>	
	Sign: <u>[Signature]</u>		

The acceptance signature on this document signifies that the customer agrees that the STB system, both Buoy and BPR, has been successfully deployed. The warranty period will begin immediately following the deployment. If the system has cleared customs for more than 30 days, the warranty period has already commenced on the 31st day after customs clearance.

COMMENTS:

The STB system has been successfully deployed on the ORV Sagar Kanya on 29/04/10. The system is operational and all data is being received. The system is being used for the purpose of tsunami early warning and oceanographic research.

23/04/10 Chief Scientist
ORV SAGAR KANYA

Master
ORV SAGAR KANYA
[Signature]
29/04/10

STB Deployment Documentation – Buoy

Date last updated: 28/04/2010

SAIC Project India I

Country India

SAIC Buoy Designator IND-01SA

Battery Type Alkaline
Hull Config STB Gillman Hull

LRU Serial Nos	Primary	Secondary
Transducer	47064	46978
CPU PCB	309 (Synchron)	306 (Synchron)
Serial PCB	323	322
Iridium Modem	300224010449270	300224010441150

Payload Information	Primary	Secondary
CPU Firmware Version	2.39	2.39
Payload ID Assigned	IN1P	IN1S
IMEI	300224010449270	300224010441150
SIM #	8988169224000275033	8988169224000275041
DATA #	881692418243	881692418244
Iridium Payload ID	0903	0904
RUDICS IP Target	115.113.76.35	115.113.76.35

Shipping Information	
Shipped To	Chennai
Date Shipped	Mar 5 2010
Date Received Destination	Apr 20 2010

Blue Tag Testing	
Begin Date	Aug 1 2009
End Date	Aug 13 2009
Tested with BPR#	BPR11 (SN341332)

Deployment Information	
Deployed with BPR#	BPR11 (SN341332)
Deployed at Station #	
Date System Deployed	Apr 25 2010
Geographic Location	Bay of Bengal
Deployment Location	Lat: 6.25 N
	Long: 88.8 E
Depth (as reported by BPR)	3790m

Configuration / Fabrication / Testing Comments:
 Ran second Blue Tag test Feb 19-21 2010.
 Benthos AM board serial numbers: Primary - D104F104, Secondary - D105F105
 Antenna serial numbers: Primary - 120878, Secondary - 136705
 Diodes installed in BPR battery and Payloads to drop voltage.
 Performed mini-BTT Feb 17-19

Life Cycle Related Notes and Comments:
 1

**Chief Scientist
ORV SAGAR KANYA**

Master
ORV SAGAR KANYA

STB Deployment Documentation - BPR**STB CONFIGURATION -- BOTTOM PRESSURE RECORDER (BPR)**

Date last updated:	28/4/2010
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SAIC Project	India I
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Country	India
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SAIC BPR Designator	IND-01BA
BPR Number	11 (SN341332)
CPU Firmware Version	2.78

Battery Type	Alkaline
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LRU Serial Nos	
Transducer	46979
CPU PCB	341 (Synchron)
BPR PCB	332
PAROS	114399
Acoustic Release	33521

Acoustic Release Codes	
Enable	364642
Disable	364661
Release	351071
TX	12KHz
RX	11KHz

Pre-Deployment BPR Oscillation Frequency	0.476837088
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Blue Tag Testing	
Begin Date	Aug 20 2009
End Date	Sep 15 2009
Tested with Buoy#	IND-01SA

Shipping Information	
Shipped To	Chennai
Date Shipped	Mar 5 2010
Date Received Destination	Apr 20 2010

Deployment Information	
Deployed with Buoy#	IND-01SA
Deployed at Station #	
Date System Deployed	Apr 25 2010
Geographic Location	Bay of Bengal
Deployment Location	Lat: 6.25 N
	Long: 88.8 E
Depth (as reported by BPR)	3790 m

Configuration / Fabrication / Testing Comments:

Blue Tag retest: Feb 17-19

Float S/N's: 280509-1, 280509-2, 020709-3, 020709-1-4, 280509-5, 280509-6, 280509-4, 280509-3, 280509-10, 280509-9

Chief Scientist
ORV SAGAR KANYA

Master
ORV SAGAR KANYA

STB Mooring Document

Project Title:

Customer ID Number:

Fabrication depth (meters):

India01

SAIC ID Number:

meters

IND-01SA

Quality Assurance	
Is the nylon prestreched?	Yes
LongLink Coil Chain: 1/2"x2m (qty2), 1/2"x4m (qty1), 1/2"x.5m (qty1)	Yes
Length of 7/16" 3x19 wire rope NILSPIN?	200 meters
NILSPIN terminations were pull-tested at min 5000 lbs?	Yes
Length of 1" nylon?	259 meters
Length of 7/8" nylon?	345 meters
Length of 3/4" nylon?	3419 meters
Check Sum depth (NILSPIN + 1" + 7/8" + 3/4" + 13)/.985	4301 meters
Is NILSPIN to nylon shackle transition taped and coated?	No

Final	Weight (Kg)	Length(m)
Basket #1	1377	4023
Basket #2	N/A	N/A
Basket #3	N/A	N/A
Anchor #1	1633kg	
Anchor #2	1633kg	
Makeup/EV spool	N/A	N/A
Misc. 1		
Misc. 2		

Start	Finish
15-Jun-09	30-Jun-09
5-Mar-10	4-Mar-10
	20-Apr-10

Glass Sphere Serial Numbers
280509-1
280509-2
020709-3
020709-1-4
280509-5
280509-6
280509-4
280509-3
280509-10
280509-9

Fabricated by: Yale Cordage, Swick, Gonzales, Graham
 Loaded and final inspected by: D. Graham
 Dates shipped from San Diego to Chennai India
 Container No. QOLU 174274 2
 Customer received by _____
 Customer acceptance by _____

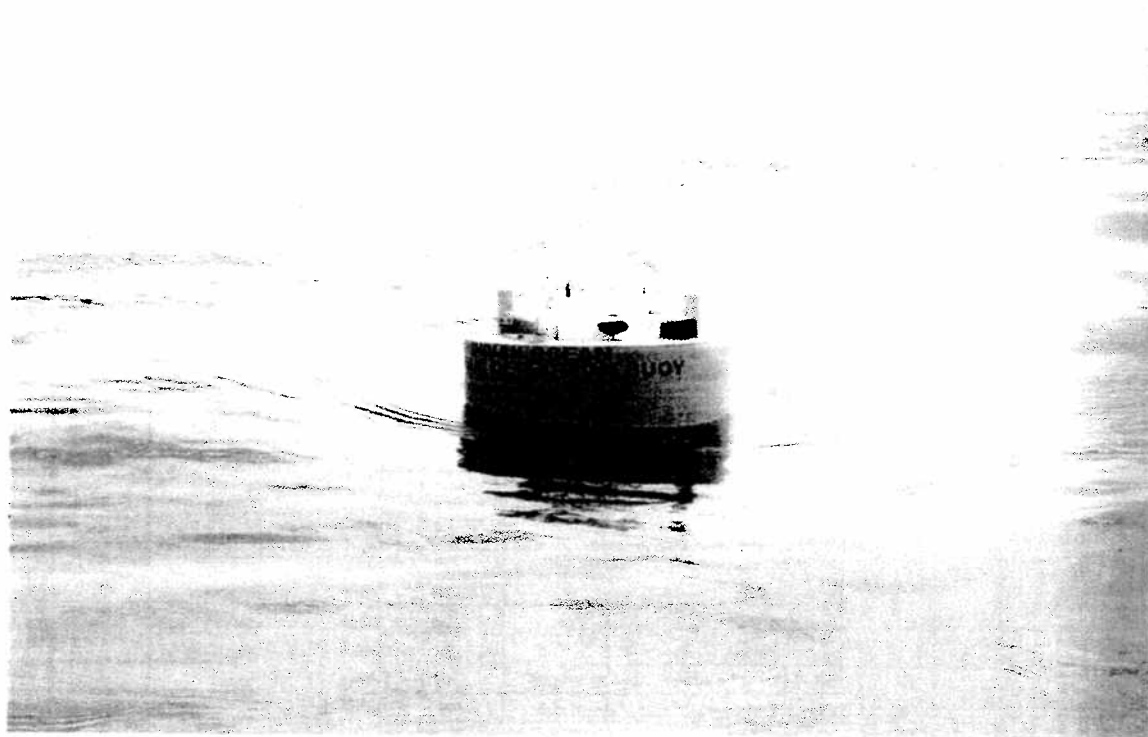
Deployment Information		
Lat (Deg/Min/Sec)	Long(Deg/Min/Sec)	
6.25 N	88.8 E	
Final Depth (m)	Deployed Date	
3790 m	25-Apr-10	

Comments: All mooring hardware and tape packed on top of mooring line in crates with a plywood spacer in between.
 High Security Seal #0868554

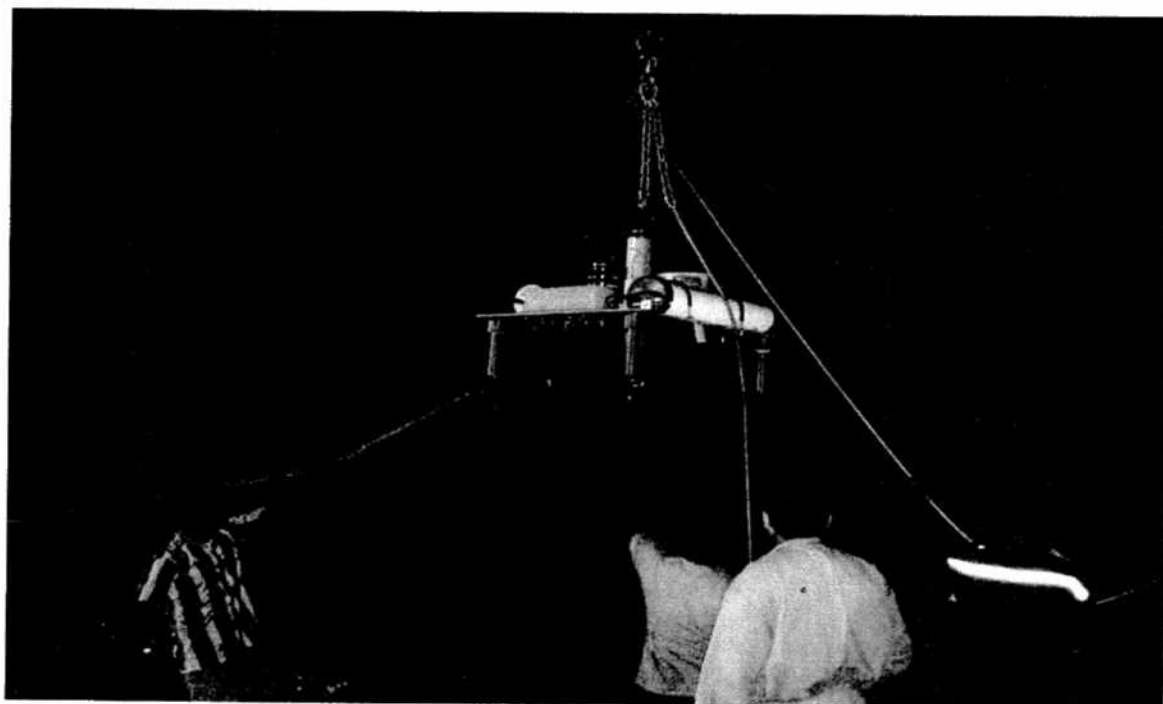
Chief Scientist
 ORN SAGAR KANTAL
 Master
 ORN SAGAR KANTAL

per drawing
 Check mooring cable
 Date of last check
 NIPSTEL
 SAGAR KANTAL

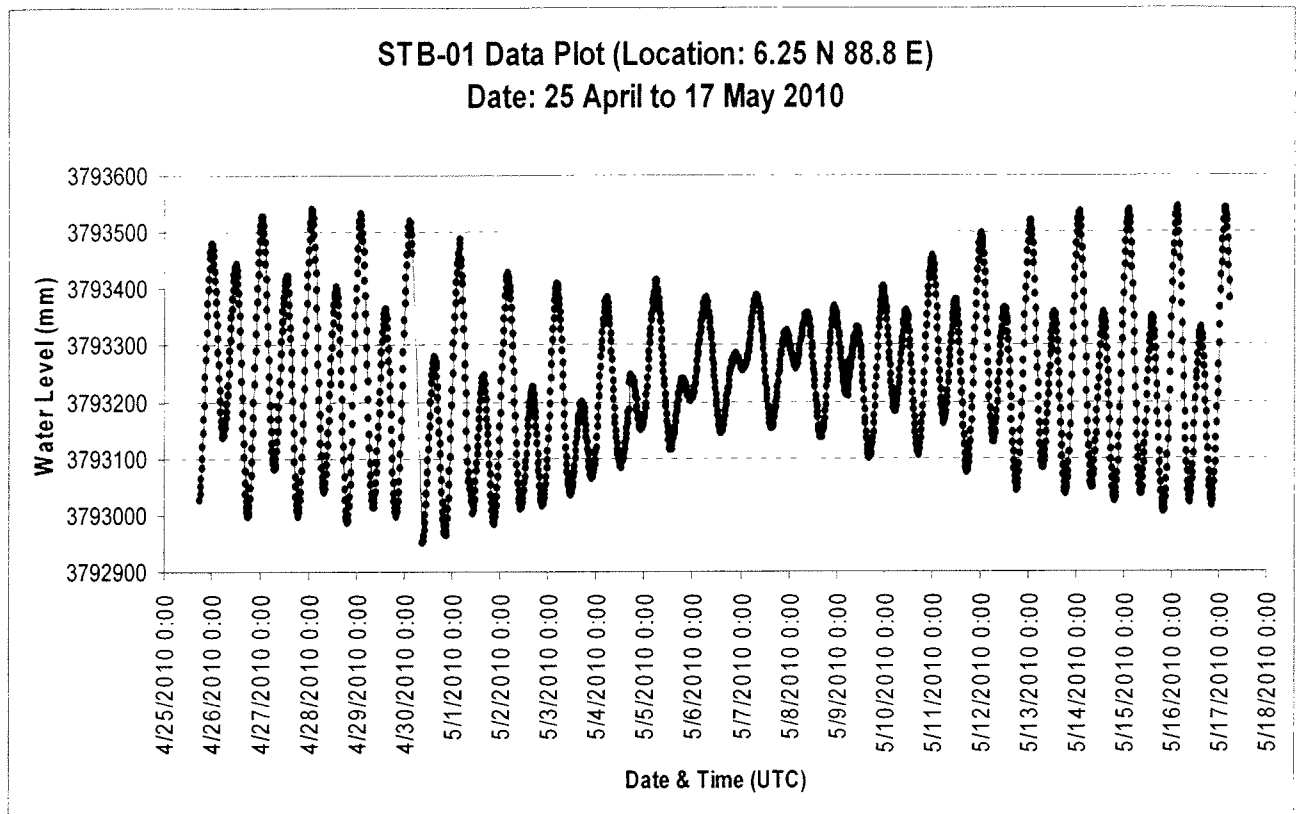
8. PHOTOS & PLOTS OF DEPLOYMENT



SAIC-STB1 at Bay of Bengal Sea on 25/04/2010 @ 5:30 PM



SAIC-BPR resides at Bay of Bengal Sea on 25/04/2010 @ 9:30 PM



Tsunami Tide Plot from 25th April to 17th May 2010

9. PERFORMANCE OF EQUIPMENTS ON BOARD SAGAR KANYA

The following equipments were used during the cruise and their performance is indicated below.

1. A frame
2. 12 tone National Oilfil Crane
3. 6 tone crane
4. Rescue boat
5. Multi Beam Echo Sounder

10. Decisions / Mails or any other correspondences had during the cruise execution.

The following communications has been communicated between the deployment team & decision taking authorities of both NIOT & INCOIS during execution of deployment of SAIC-Tsunami Buoy STB1.

Mail 1: Requesting for the change of deployment location reg.

From: Sagar Kanya - MASTER [master@sagarkanya.amosconnect.com]
Sent: Sunday, April 25, 2010 11:14 AM
To: Srinivas Kumar T
Cc: raju@niot.res.in; Satish Shenoi; r.srini@niot.res.in; mmsubbu@ncaor.org
Subject: SK-271 reg change of location for STB1

Dear Dr.Srinivaskumar, Head, ASG, INCOIS

As discussed with you over telephone today (25/04/2010) morning by 9 AM, regarding the status of more dense ship traffic in the location (6.05N , 88.8E, Depth of 3800-3900m) selected for the deployment of SAIC STB1. (Morning we saw 7 bigger vessels passing through and near the above location).

As an alternate the possibility of further Western direction from the location was considered and that also seem to be the path of international ships passing from western countries to Japan and other eastern parts of countries & vice versa.

Hence it is decided to move 15 to 20 nm northern direction from the location decided earlier. Also the above decision was discussed with SAIC deployment team onboard, considering the depth of operation and scenario like the point is away from international ship route etc,

Besides all the above present status is conveyed to you and as per your confirmation, the deployment team is proceeding for deployment at the new location.

The exact latitude & Longitude will be sent to you soon.

Regards

R,Srinivasan,CS & team Onboard,SK271

From: Srinivas Kumar T <srinivas@incois.gov.in@SMT>
To: Sagar Kanya - MASTER Sent 4/26/2010 7:37 AM
Cc: raju@niot.res.in Sent 4/25/2010 6:17 PM
<raju@niot.res.in@SMT>
Cc: Satish Shenoi Sent 4/25/2010 6:17 PM
<ssheno@incois.gov.in@SMT>
Cc: NIOT R.SRINI@NIOT.RES.IN Sent 4/25/2010 6:17 PM
<rsrini@niot.res.in@SMT>
Cc: mmsubbu@ncaor.org Sent 4/25/2010 6:17 PM
<mmsubbu@ncaor.org@SMT>
Date: Sunday, April 25, 2010 6:17 PM Msg: AMOS-237593998
Path: WMASTERWInBox
Subject: RE: SK-271 reg change of location for STB1

Dear Srinivasan,

Good that you have noticed the ship traffic and decided to relocate the position of the STB1.

15 to 20 nm northwards from the earlier decided location is OK. Please go ahead as you feel appropriate.

with best regards

Srinivas

T. Srinivasa Kumar

Head, Advisory Services and Satellite Oceanography Group (ASG)
Project Manager, National Tsunami Early Warning System (NTEWS)
Secretary, Indian Ocean Global Ocean Observing System (IOGOOS)

Indian National Centre for Ocean Information Services (INCOIS)
"Ocean Valley", PB No. 21,
IDA Jeedimetla P.O.,
Hyderabad - 500 055
Andhra Pradesh, INDIA

Tel: +91 40 2389 5006 / 2388 6006

Fax: +91 40 2389 5001

Mail on 26/04/2010 ***Congrazulating the deployment team ***

From: M.A. Atmanand, <atma@niot.res.in@SMT>
To : Srinivas Kumar T Sent 4/26/2010 11:51 AM
<srinivas@incois.gov.in@SMT>
Cc : Satish Shenoi Sent 4/26/2010 11:51 AM
<shenoi@incois.gov.in@SMT>
Cc : NIOT DIRECTOR Sent 4/26/2010 11:51 AM
<director@niot.res.in@SMT>
Cc : SAIC USA Sent 4/26/2010 11:51 AM
<thai@saic.com@SMT>
Cc : SAIC USA Sent 4/26/2010 11:51 AM
<admin@sagarkanya.amosconnect.com@SMT>
Cc : Sagar Kanya - MASTER Sent 4/26/2010 12:50 PM
Cc : NIOT DR.V.RAJENDRAN Sent 4/26/2010 11:51 AM
<raju@niot.res.in@SMT>
Date: Monday, April 26, 2010 11:51 AM Msg: AMOS-237700606
Path: WMASTERWInBox
Sub : Re: SK-271 RE: DEPLOYMENT OF SAIC STB1

Thank you Dr. Srinivas. Let us continue to work together more and more in future too.

Regards

Atmanand

Dr. M. A. Atmanand
Director
National Institute of Ocean Technology
Ministry of Earth Sciences
Velachery - Tambaram Road
Pallikaranai
Chennai 600 100
Phone + 91 44 2246 1029

----- Original Message -----

From: "Srinivas Kumar T" <srinivas@incois.gov.in>
To: "Sagar Kanya - MASTER" <master@sagarkanya.amosconnect.com>; "NIOT
DR.V.RAJENDRAN" <raju@niot.res.in>
Cc: "Satish Shenoi" <shenoi@incois.gov.in>; "NIOT DIRECTOR"
<director@niot.res.in>; "NIOT DIRECTOR" <atma@niot.res.in>; "SAIC USA"
<thai@saic.com>; "SAIC USA" <admin@sagarkanya.amosconnect.com>
Sent: Monday, April 26, 2010 10:51 AM
Subject: RE: SK-271 RE: DEPLOYMENT OF SAIC STB1

Dear Srinivasan and Team,

Congratulations and well done.

with best regards

Srinivas

T. Srinivasa Kumar

Head, Advisory Services and Satellite Oceanography Group (ASG)
Project Manager, National Tsunami Early Warning System (NTEWS)
Secretary, Indian Ocean Global Ocean Observing System (IOGOOS)

Indian National Centre for Ocean Information Services (INCOIS)
"Ocean Valley", PB No. 21,
IDA Jeedimetla P.O.,
Hyderabad - 500 055
Andhra Pradesh, INDIA

Tel: +91 40 2389 5006 / 2388 6006
Fax: +91 40 2389 5001

From: Sagar Kanya - MASTER [master@sagarkanya.amosconnect.com]
Sent: Monday, April 26, 2010 8:05 AM
To: Srinivas Kumar T; NIOT DR.V.RAJENDRAN
Cc: Satish Shenoi; NIOT DIRECTOR; NIOT DIRECTOR; SAIC USA; SAIC USA
Subject: SK-271 RE: DEPLOYMENT OF SAIC STB1

Dear Sirs,

The deployment team onboard ORV Sagar Kanya has successfully completed the deployment of SAIC Tsunami Buoy- STB1 at the location 6.25 N, 88.8E and at a depth of 3840m and BPR also positioned suitably by 9:30 PM, 25/04/2010. The SAIC team at California, USA confirmed the continuous data reception from our STB1 by polling the INCOIS RUDICS server. All the requested Tests have been carried out after the deployment of both SAIC surface buoy and BPR systems.

We have started sailing to Chennai and the ETA at Chennai will be Noon, 29/04/2010.

The list of items to be off loaded at Chennai from SK271 cruise will be sent to Mr. Subramaniam, NCAOR, by late 11 AM, 26/04/2010.

Regards
R. Srinivasan,
Chief Scientist & Team on board ORV Sagar Kanya.

11. Conclusion

We are happy to inform and conclude that the team headed by the undersigned had successfully deployed the SAIC Tsunami Buoy (STB1) India which is similar and/or exceeds the specification of NOAA-DART-II buoy systems for our country is concerned.

We strongly hope that this kind of 100% redundant systems will work more than its indented warranty of 2 years as buoy is concerned & 3 years for BPR.

We express our heartfelt thanks to all the ship crew members onboard on their timely cooperation for successful execution of this deployment. Also we extend our gratitude & grateful thanks to the Director's of NIOT & INCOIS for assigning this new project to this team.