



**ENC Scheme for the NIOHC region prepared by
the North Indian Ocean International Charting
Coordination Working Group (NICCWG).**

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INTRODUCTION

The purpose of the North Indian Ocean International Charting Coordination Working Group (NICCWG) is to facilitate the production and promote the availability of official electronic chart data for safe, efficient, and environmentally sensitive maritime navigation within the NIOHC Region.

In order to ensure that adequate regional ENC coverage will be available to meet International Maritime Organization (IMO) Electronic Chart Display and Information System (ECDIS) carriage requirements in a timely manner, the NICCWG was tasked to develop an ENC scheme to ensure adequate ENC coverage and to include provision for additional/replacement coverage over time.

ENCs are required to enable safe port-to-port navigation for international shipping, and they must correspond to the paper chart coverage for the routes between the ports, as well as the port areas themselves.

This report and its annexes:

- 1) summarizes the current status of ENC coverage for the entire NIOHC region to week 10/2019,
- 2) depicts a regional ENC scheme (Annex A) in a format similar to that of the paper INT Chart Scheme found in S-11 Part B Region J,
- 3) contains recommendations for near-term actions to resolve specific identified issues.

IHO WEND PRINCIPLES

The purpose of WEND is to ensure that high quality, updated, official ENCs are provided through integrated services that support chart carriage requirements of SOLAS Chapter V. according to the IMO performance standards for ECDIS:

- Member States will strive to ensure that mariners, anywhere in the world, can obtain fully updated ENCs for all shipping routes and ports across the world.
- Member States will strive to ensure that their ENC data is available to users through integrated services, each accessible to any ECDIS user (i.e., providing data in S-57 format), in addition to any national distribution or system-specific SENC delivery.
- Member States are encouraged to distribute their ENCs through a RENC in order to share a common experience and reduce expenditure, and to ensure the greatest possible standardization, consistency, reliability, and availability of ENCs.
- ENC duplication should be avoided; only a single country should produce an ENC for any given area. Normally, a Member State produces ENCs

within their national waters; however, they can delegate responsibility for the production of ENCs, completely or in part, to another country. The designated country then becomes the producing country in the considered area.

WORK PLANS AND PROCESS

The process so far takes the existing ENC coverage within the NIOHC region as a starting point and compares it to INT Chart coverage.

This coverage should be assessed against:

- traffic routes
- port coverage
- action plans for addressing gaps and overlaps in ENC coverage between countries;

We recommend setting up a regular biannual teleconference to discuss progress on the scheme.

DATA ANALYSIS METHODOLOGIES

To successfully and accurately report on regional ENC coverage, and to appropriately plan to address regional ENC deficiencies, the UKHO has produced a baseline assessment of regional ENC coverage, from the ADMIRALTY Vector Chart Service (AVCS).

The UKHO adhered to the following for ENC analysis:

1. Assess deficiencies in ENC Coverage for Navigation Purpose (Usage bands) 1, 2, and 3 Electronic Navigational Charts (ENC).
 - a. Overview (Band 1) cells within region coverage;
 - b. General (Band 2) cells against INT chart scheme from S-11 Part B Region J;
 - c. Coastal (Band 3) cells for the region against INT chart scheme from S-11 Part B Region J.

Further analysis by the NICCWG on the following:

2. Assessment to be undertaken on deficiencies in coverage within National ENC schemes.

- a. Identify small gaps or slivers existing between same navigation purpose ENC cells within the same national schemes;
 - b. Identify small gaps or slivers existing between same navigation purpose ENC cells that junction with ENCs of other national schemes.
3. Identification of overlapping areas of same navigation purpose ENC Cells.
 - a. Collect polygons representing areas of overlap;
 - b. List affected overlapping cells.
4. Identify any other data anomalies, such as navigation purposes that are inconsistent with the scale of the ENC cell.
5. Identify and consider proposed updates to the ENC scheme over the next year from new cells or revised limits.
6. Prepare a report of all identified data deficiencies for the NIOHC region.
 - a. Report all data gaps;

The UKHO are aware of three gaps in Band 1 and 2 coverage in areas that adjoin the following GB cells: GB104704, GB20829A and GB20830A.

 - i. GB104704. On the northern edge there is a gap of 120 metres between the adjoining cell IN17705B. The gap between the cells on the eastern edge varies between 128 metres and 144 metres. At the chart scale the maximum size of the gap is 0.065 mm.
 - ii. GB20829A. In the southeast corner of this cell, the gap in the coverage between it and the adjoining cell IN2473NI varies between nothing and 182 metres. At the chart scale the gap equates to a maximum of 0.364 mm.
 - iii. GB20830A. In the southwest corner of this cell, the gap in the coverage between it and the adjoining cell IN2472NI varies between 30 and 466 metres. At the chart scale the largest gap equates to 0.932 mm.
 - b. Report all data overlaps;

The overlaps within region will be highlighted in the WENDWG presentation to be delivered during plenary.
 - c. Propose recommendations to fix data deficiencies.

The gaps relating to the two GB ENC cells GB20829A and GB20830A highlighted above, can be resolved by the UKHO. They need to amend the limits in the affected areas to agree with the adjoining band 2 IN cells. The correction will be completed as soon as possible using the M_COVR of the two adjoining IN cells IN2472NI and IN2473NI.

The GB overlaps are currently being worked on and will be resolved within the next two weeks.

CONCLUSIONS

1. Overview coverage (Band 1) ENC's are complete for the region. Member States intending to produce further cells within this scheme will need to consult NICCWG prior to completion of their cells to ensure no overlap of data.
2. General coverage (Band 2) ENC's are complete for the region. Member States intending to produce further cells within this scheme will need to consult NICCWG prior to completion of their cells to ensure no overlap of data.
3. Coastal coverage (Band 3) ENC's have some gaps mainly in the Red Sea and along the coasts of Yemen, Saudi Arabia, Egypt, Sudan and Somalia. Member States are encouraged to provide details of ENC production within these areas to NICCWG for inclusion in the scheme.
4. Analysis of gaps and overlaps as defined in Methodologies 2-5 above should be carried out by NICCWG on receipt of WEND-WG data.

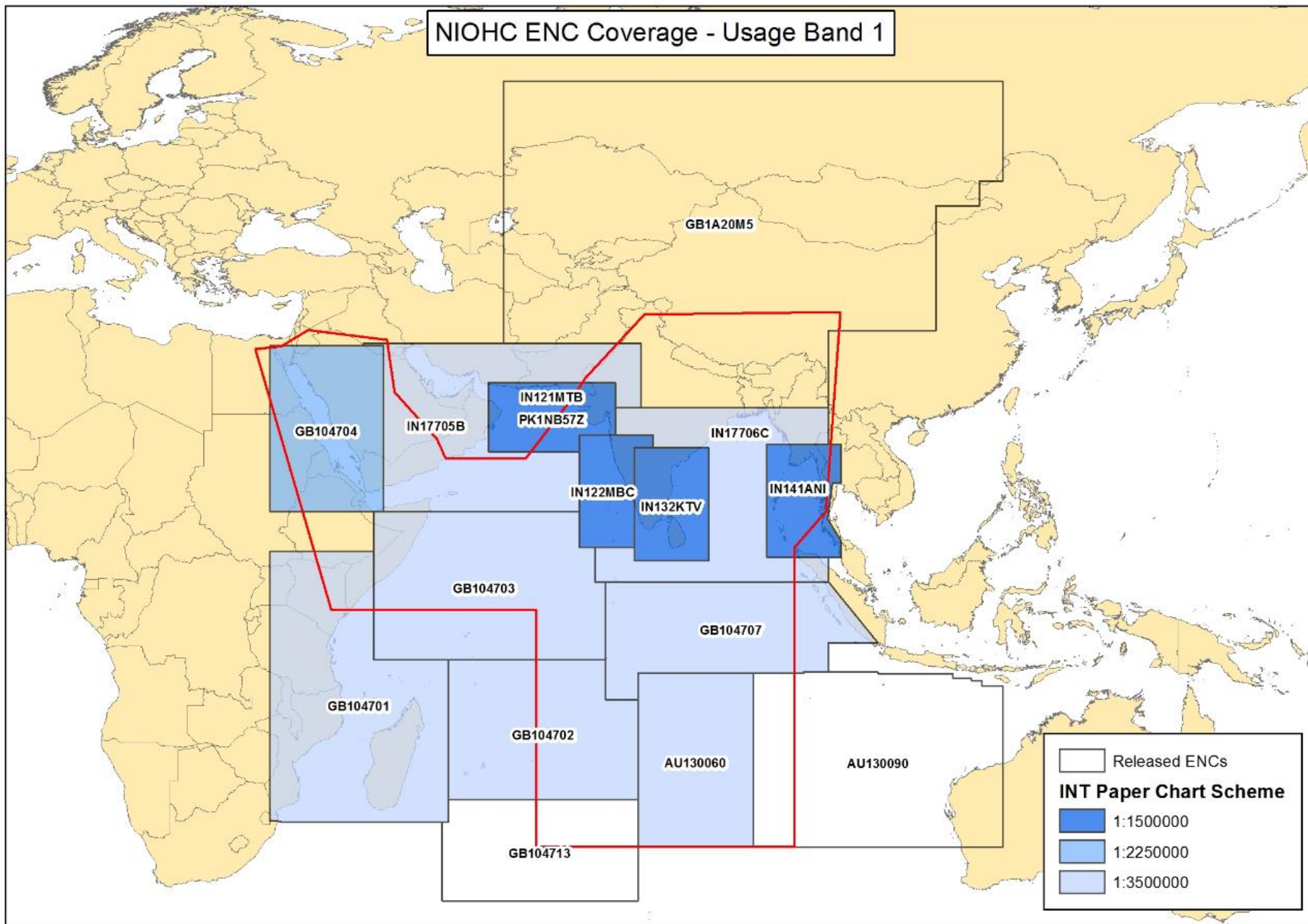
RECOMMENDATIONS FOR DISCUSSION AT 19TH NIOHC

1. Members of the NICCWG and NIOHC note the report and discuss the findings in order to progress the ENC scheme for the region.
2. Members of the NIOHC with national ENC schemes in the planning stage are encouraged to provide details of the scheme to the NICCWG chair and vice-chair to ensure integration into the NIOHC ENC scheme.
3. NICCWG work towards completing analysis for Approach and Port (Bands 4 & 5) coverage. The final graphic shows the extent of the Band 4 to 6 cells.

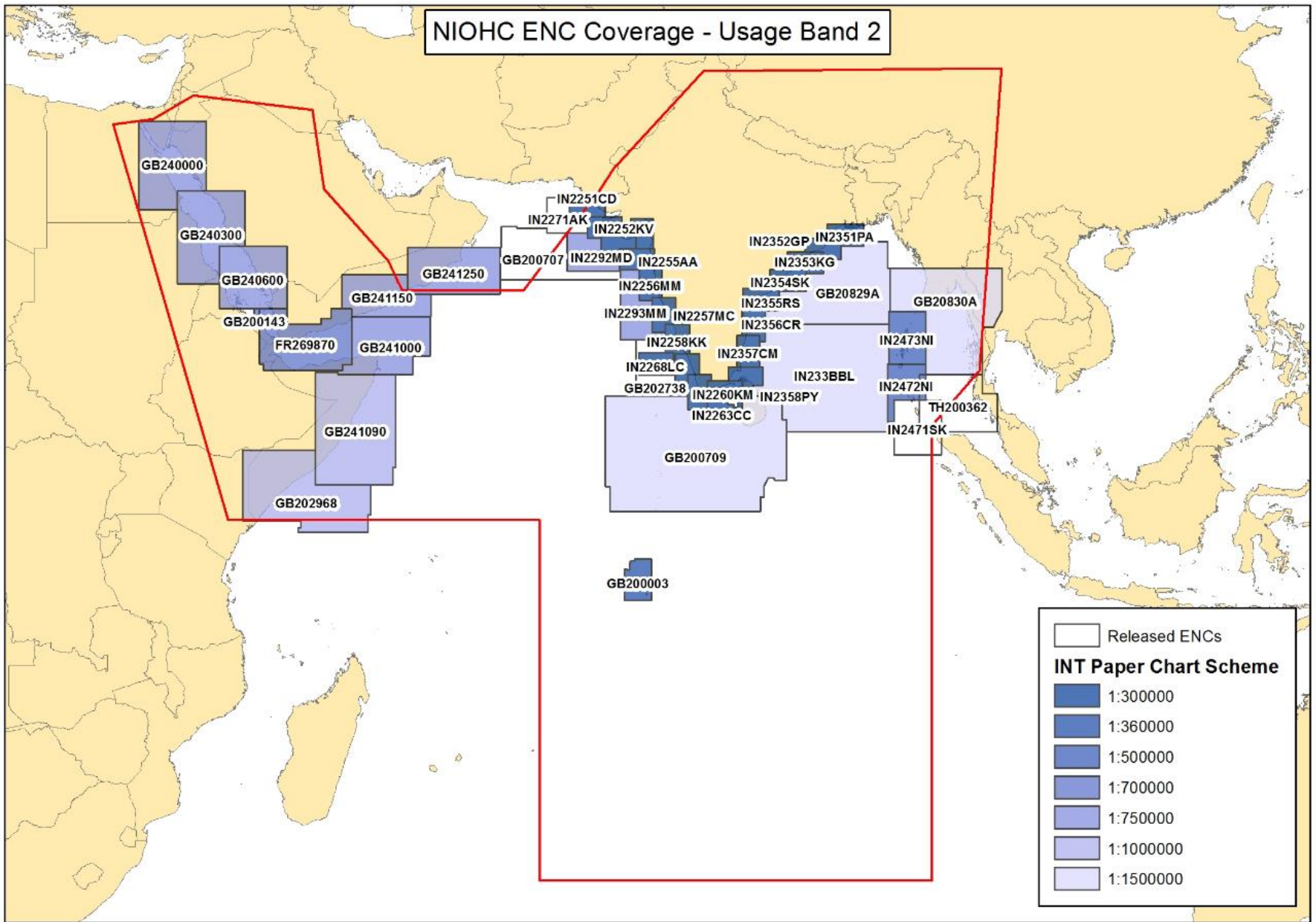
Prepared at Taunton by UKHO on behalf of the NICCWG

19th March 2019

NIOHC ENC Coverage - Usage Band 1



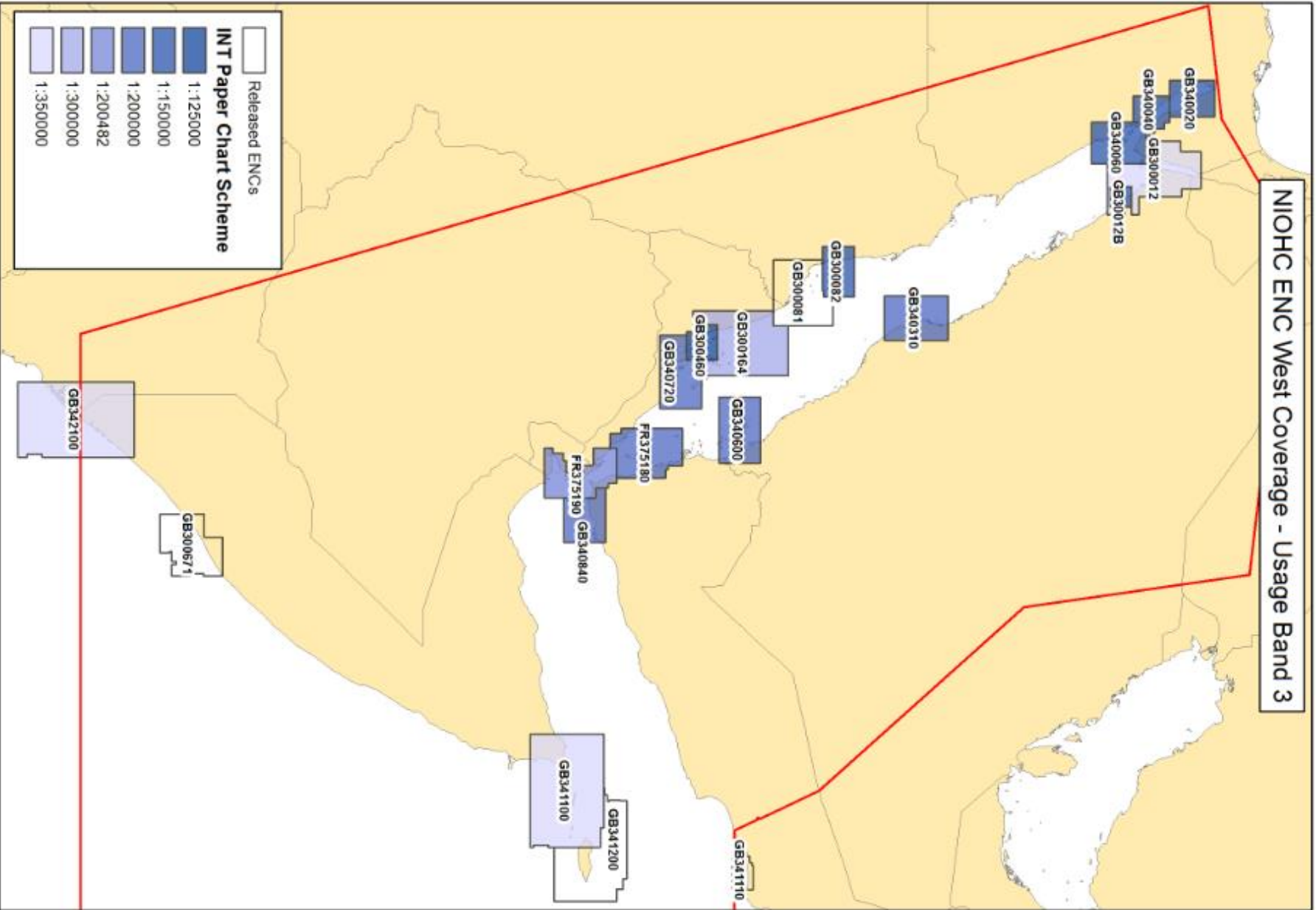
Usage Band 1 ENC's - NIOHC							
Cell Number	Usage Band	Scale	Title	Producing Authority	INT Chart Source	INT Chart Producer	INT Chart Scale 1
AU130060	1	3500000	Australia - Mid Indian Ocean Basin	AHS	714	AU	3500000
AU130090	1	3500000	Australia - North West Approaches	AHS			
GB104701	1	3500000	Indian Ocean - Maputo to South West of Muqdisho	UKHO	701	GB	3500000
GB104702	1	3500000	Indian Ocean - Part Chagos Archipelago to Ile De La Reunion	UKHO	702	GB	3500000
GB104703	1	3500000	Indian Ocean - Somalia to the Chagos Archipelago and the Seychelles Group	UKHO	703	GB	3500000
GB104704	1	1500000	Red Sea	UKHO	704	GB	2250000
GB104707	1	3500000	Indian Ocean - Part Chagos Archipelago to Sumatera	UKHO	707	GB	3500000
GB104713	1	3500000	Indian Ocean - Southwest Indian Ridge	UKHO			
IN121MTB	1	700000	Title Not Specified	INHO			
IN122MBC	1	700000	Bombay to Cape Comorin	INHO	752	IN	1500000
IN132KTV	1	700000	Kochi to Visakhapatnam	INHO	754	IN	1500000
IN141ANI	1	700000	Title Not Specified	INHO	757	IN	1500000
IN17705B	1	3000000	Arabian Sea	INHO	705	IN	3500000
IN17706C	1	3000000	Bay of Bengal	INHO	705	IN	3500000
PK1NB57Z	1	1500000	Bombay to Muscat	PKHO	751	PK	1500000
GB1A20M5	1	20000000	Northern Hemisphere - 60E to 120E	UKHO			

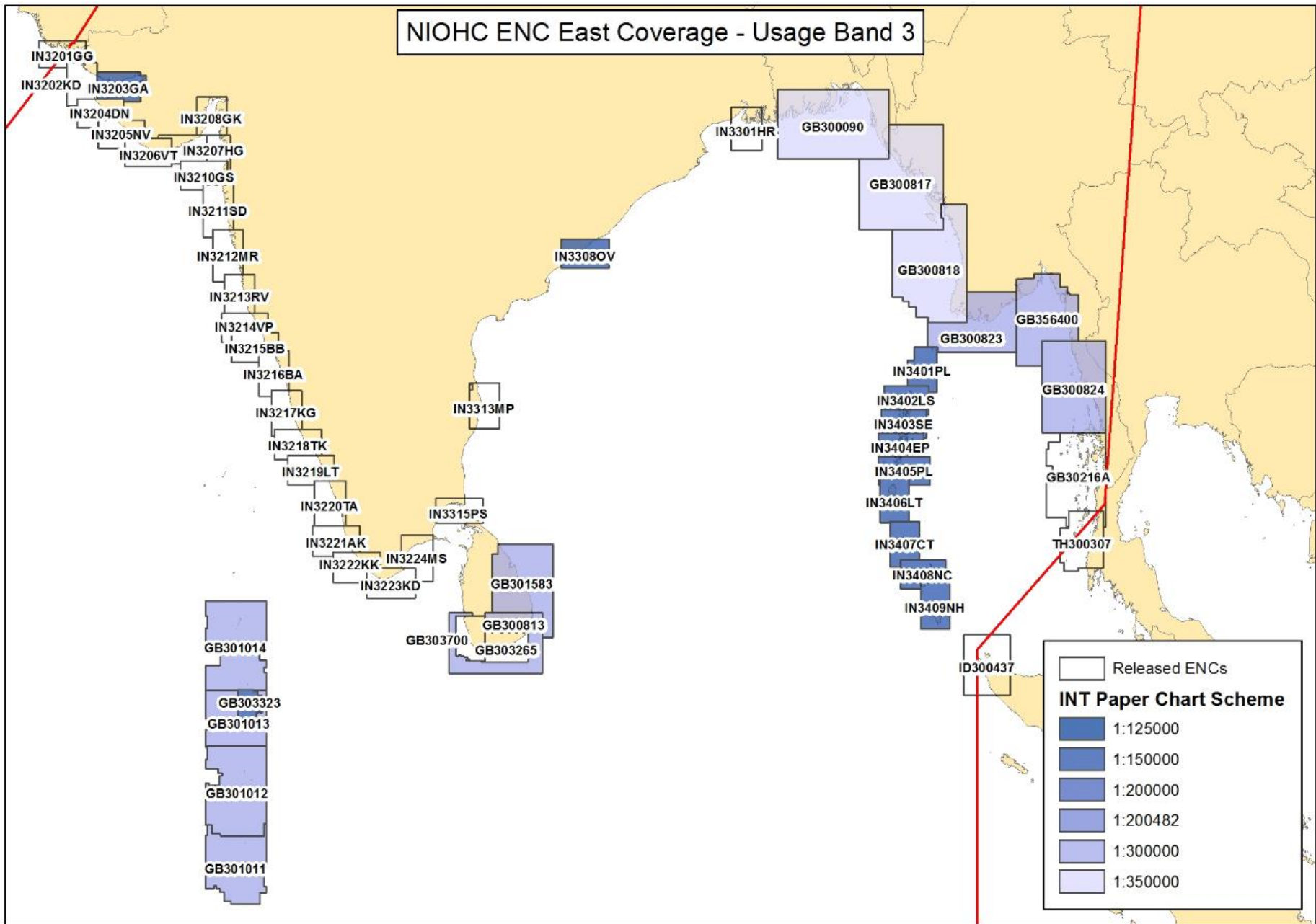


Usage Band 2 ENC's - NIOHC							
Cell Number	Usage Band	Scale	Title	Producing Authority	INT Chart Source	INT Chart Producer	INT Chart Scale 1
FR269870	2	700000	Gulf of Aden - Bab El Mandeb	SHOM	7004	FR	700000
GB200003	2	350000	British Indian Ocean Territory - Chagos Archipelago	UKHO	7380	GB	360000
GB200143	2	350000	Ras Cosar to Ras Alob	UKHO	7005	GB	700000
GB200707	2	700000	Arabian Sea	UKHO			
GB200709	2	1500000	Indian Ocean - Maldives to Sri Lanka	UKHO	753	GB	1500000
GB202738	2	700000	Lakshadweep Sea - Northern Part	UKHO			
GB202968	2	700000	Africa - East Coast - Lamu to Cadale (Itala)	UKHO	7000	GB	1000000
GB20829A	2	1500000	Indian Ocean - Bay of Bengal - Northern Part	UKHO	756	IN	1500000
GB20830A	2	1500000	Bay of Bengal - Andaman Sea	UKHO	757	IN	1500000
GB240000	2	700000	Red Sea - Suez (El Suweis) to Gezirat Wadi Gimal	UKHO	7010	GB	750000
GB240300	2	700000	Berenice to Masamirit	UKHO	7008	GB	750000
GB240600	2	700000	Masamirit to Jazirat at Ta'ir	UKHO	7006	GB	750000
GB241000	2	700000	Somalia and Yemen - Eastern Approaches to the Gulf of Aden	UKHO	7002	GB	750000
GB241090	2	700000	Africa - East Coast. Cadale (Itala) to Raas Macbar	UKHO	7001	GB	1000000
GB241150	2	700000	Arabia - South East Coast - Ash Shihr to Ra's Marbat	UKHO	7014	GB	750000
GB241250	2	700000	Arabia - South East Coast - Kuria Muria Islands to Khalij al Masirah	UKHO	7015	OM	750000
IN2251CD	2	180000	Sir Creek to Dwarka	INHO	7318	IN	300000
IN2252KV	2	180000	Okha to Veraval	INHO	7325	IN	300000
IN2253RP	2	180000	Veraval to Pipavav	INHO	7328	IN	300000
IN2254AK	2	180000	Approaches to Gulf of Khambhat (Cambay)	INHO	7331	IN	300000
IN2255AA	2	180000	Approaches to Mumbai	INHO	7334	IN	300000
IN2256MM	2	300000	Murud Janjira Hr. to Malvan	INHO	7340	IN	300000
IN2257MC	2	300000	Malvan to Coondapoor	INHO	7343	IN	300000
IN2258KK	2	180000	Coondapoor to Badagara	INHO	7348	IN	300000
IN2259BK	2	300000	Badagara to Cochin(Kochi)	INHO	7356	IN	300000
IN2260KM	2	300000	Cochin to Cape Comorin	INHO	7362	IN	300000

Cell Number	Usage Band	Scale	Title	Producing Authority	INT Chart Source	INT Chart Producer	INT Chart Scale 1
IN2261EI	2		Eight Degree Channel to Cape Comorin	INHO			
IN2262CP	2	180000	Cape Comorin to Pamban	INHO	7365	IN	300000
IN2263CC	2	300000	Cape Comorin to Colombo	INHO	7383	IN	300000
IN2268LC	2	180000	Central Lakshadweep	INHO	7353	IN	300000
IN2271AK	2	350000	Approaches to Gulf of Kachchh	INHO			
IN2292MD	2	700000	Dwarka to Mumbai	INHO	7021	IN	750000
IN2293MM	2	700000	Mumbai to New Mangalore	INHO	7022	IN	750000
IN233BBL	2	700000	Bay of Bengal - Southern Portion	INHO	755	IN	1500000
IN2351PA	2	300000	Paradip to Pussur River	INHO	7419	IN	300000
IN2352GP	2	300000	Gopalpur to Paradip	INHO	7416	IN	300000
IN2353KG	2	300000	Kalingapatnam to Gopalpur	INHO	7413	IN	300000
IN2354SK	2	300000	Sacramento Shoal to Kalingapatnam	INHO	7408	IN	300000
IN2355RS	2	300000	Ramayapatnam to Sacramento Shoal	INHO	7405	IN	300000
IN2356CR	2	300000	Chennai (Madras) to Ramaypatnam	INHO	7400	IN	300000
IN2357CM	2	300000	Point Calimere to Chennai	INHO	7397	IN	300000
IN2358PY	2	180000	Approaches to Palk Bay	INHO	7394	IN	300000
IN2471SK	2	700000	Katchal and Sumatra	INHO			
IN2472NI	2	350000	Nicobar Island	INHO	7032	IN	500000
IN2473NI	2	350000	Andaman Island	INHO	7031	IN	500000
TH200362	2	700000	Satun to Ranong	RTNHD			

NIOHC ENC West Coverage - Usage Band 3





Usage Band 3 ENC's - NIOHC							
Cell Number	Usage Band	Scale	Title	Producing Authority	INT Chart Source	INT Chart Producer	INT Chart Scale 1
FR375180	3	180000	Al Hudaydah to Al Mukha	SHOM	7118	FR	200000
FR375190	3	180000	Bab El Mandeb and Golfe de Tadjoura	SHOM	7114	FR	200482
GB300012	3	350000	Red Sea - Al 'Aqaba to Duba	UKHO	7142	GB	350000
GB300081	3	180000	Red Sea - Ras Lakham to Ras Qassar	UKHO			
GB300082	3	90000	Red Sea - Sudan - Outer Approaches to Port Sudan	UKHO	7128	GB	150000
GB300090	3	350000	Bay of Bengal - Bangladesh - Malancha River to Saint Martin's Island	UKHO	7425	BD	350000
GB30012B	3	90000	Red Sea - Saudi Arabia - Approaches to Duba	UKHO	7142	GB	150000
GB300164	3	180000	Red Sea - Eritrea - North and North-East Approaches to Massawa (Mits'iwa)	UKHO	7124	GB	300000
GB300460	3	90000	Approaches to Massawa (Mits'iwa)	UKHO	7125	GB	125000
GB300671	3	180000	Outer Approaches to Muqdisho and Marka Anchorage	UKHO		GB	300000
GB300813	3	180000	Sri Lanka - South Coast - Dondra Head to Sangama Kanda Point	UKHO	7386	GB	300000
GB300817	3	350000	Bay of Bengal - Bangladesh and Burma (Myanmar) - Shahpuri Point to Mun Aung Island	UKHO	7430	GB	350000
GB300818	3	350000	Bay of Bengal - Burma - Manaung (Cheduba) Island to Pathein River	UKHO	7433	GB	350000
GB300823	3	180000	Pyamalaw River to Rangoon River	UKHO	7438	GB	300000
GB300824	3	180000	Andaman Sea - Burma (Myanmar) - Heinze Islands to Mergui	UKHO	7444	GB	300000
GB301011	3	180000	Indian Ocean - Maldives - Addu Atholhu to Huvadhuatholhu Uthuruburi	UKHO	7377	GB	300000
GB301012	3	180000	Indian Ocean - Maldives - North Huvadho Atoll to Mulaku Atoll	UKHO	7374	GB	300000
GB301013	3	180000	Indian Ocean - Maldives - Mulaku Atholhu to Maalhosmadulu Atholhu Dhekunuburi	UKHO	7371	GB	300000
GB301014	3	180000	Indian Ocean - Maldives - Maalhosmadulu Atholhu Dhekunuburi to Ihavandhippolhu	UKHO	7368	GB	300000
GB301583	3	180000	Sri Lanka - East Coast - Akkeraipattu to Pulmoddai Roads	UKHO	7389	GB	300000
GB30216A	3	180000	Mergui Archipelago	UKHO		GB	300000
GB303265	3	90000	Sri Lanka - South Coast - Weligama to Little Basses Reef	UKHO			
GB303323	3	90000	Indian Ocean - Maldives - Male' Atoll	UKHO	7372	GB	150000
GB303700	3	90000	Sri Lanka - Weligama to Colombo	UKHO			
GB340020	3	90000	Suez Bay to Ras Sheratib	UKHO	7136	GB	150000

Cell Number	Usage Band	Scale	Title	Producing Authority	INT Chart Source	INT Chart Producer	INT Chart Scale 1
GB340040	3	90000	Ras Sheratib to Ashrafi Islands	UKHO	7134	GB	150000
GB340060	3	90000	Ashrafi Islands to Safaga	UKHO	7132	GB	150000
GB340310	3	180000	Shi'b Nazar to Qita'kidan	UKHO	7148	GB	200000
GB340600	3	180000	Approaches to Jizan	UKHO	7154	GB	200000
GB340720	3	180000	Southern Approaches to Massawa (Mits'iwa)	UKHO	7122	GB	200000
GB340840	3	180000	Ghubbat Al Haykah to Aden Harbour	UKHO	7162	GB	200000
GB341100	3	350000	Gees Gwardafuy (Raas Caseyr) to Suqutra (Socotra)	UKHO	7110	GB	350000
GB341110	3	90000	Outer Approaches to Port Salalah (Mina Raysut)	UKHO			
GB341200	3	350000	Suqutra (Socotra)	UKHO			
GB342100	3	350000	Lamu to Kismaayo	UKHO	7705	GB	350000
GB356400	3	180000	Rangoon River to Heinze Island	UKHO	7441	GB	300000
ID300437	3	180000	Sumatera Pantai Barat Laut Sigli ke Pulau Rondo hingga Pulau Raya	DISHIDROS			
IN3201GG	3	150000	Gorachan Creek to Godia Creek	INHO			
IN3202KD	3	90000	Jakhau to Dwarka	INHO			
IN3203GA	3	150000	Gulf of Kachchh	INHO	7319	IN	150000
IN3204DN	3	150000	Dwarka to Navibandar	INHO			
IN3205NV	3	150000	Navibandar to Veraval	INHO			
IN3206VT	3	150000	Veraval to Diu Head	INHO			
IN3207HG	3	90000	Diu Head to Gopinath Point	INHO			
IN3208GK	3	150000	Gulf of Khambhat (Cambay)	INHO			
IN3209AU	3	90000	Hazira to Umargam	INHO			
IN3210GS	3	150000	Umargam to Satpati	INHO			
IN3211SM	3	150000	Cancelled Cell (Satpati to Murud Janjira)	INHO			
IN3212MR	3	150000	Murud - Janjira Hr. to Ratnagiri	INHO			
IN3213RV	3	150000	Ratnagiri to Vengurla	INHO			
IN3214VP	3	150000	Vengurla to Betul	INHO			
IN3215BB	3	150000	Betul to Belekeri	INHO			
IN3216BA	3	150000	Belekeri to Kundapura	INHO			

Cell Number	Usage Band	Scale	Title	Producing Authority	INT Chart Source	INT Chart Producer	INT Chart Scale 1
IN3217KG	3	150000	Coondapoor to Kasaragod	INHO			
IN3218TK	3	150000	Kasaragod to Tellicherry	INHO			
IN3219LT	3	150000	Tellicherry to Tanur Nagaram	INHO			
IN3220TA	3	150000	Tanur Nagaram to Manakkudam	INHO			
IN3221AK	3	150000	Alleppey to Quilon	INHO			
IN3222KK	3	150000	Kollam (Quilon) to Kolachel	INHO			
IN3223KD	3	150000	Kolachel to Manappad	INHO			
IN3224MS	3	150000	Manappad to Setukkarai	INHO			
IN3301HR	3	90000	Approaches to Hugli River	INHO			
IN3308OV	3	150000	Title Not Specified	INHO	7409	IN	150000
IN3313MP	3	150000	Mamallapuram (Mahabalipuram) to Pt. Pudi	INHO			
IN3315PS	3	125000	Palk Strait	INHO			
IN3401PL	3	150000	Preparis Island to Landfall Island	INHO	7435	IN	150000
IN3402LS	3	150000	Landfall Island to Stewart Sound	INHO	7436	IN	150000
IN3403SE	3	150000	Stewart Sound to Elphinstone Harbour	INHO	7437	IN	150000
IN3404EP	3	150000	Elphinstone Harbour to Port Blair	INHO	7439	IN	150000
IN3405PL	3	150000	Port Blair to Little Andaman Island	INHO	7440	IN	150000
IN3406LT	3	150000	Little Andaman to Ten Degree Channel	INHO	7443	IN	150000
IN3407CT	3	90000	Ten Degree Channel to Chowra Island	INHO	7445	IN	150000
IN3408NC	3	90000	Chowra Island to Nancowry Harbour	INHO	7446	IN	150000
IN3409NH	3	150000	Nancowry Harbour to Great Nicobar Island	INHO	7448	IN	150000
TH300307	3	180000	Phangnga to Ranong	RTNHD			
IN3211SD	3	90000	Satpati to Dighi Harbour	INHO			
GB300726	3	90000	Egmont Islands to Three Brothers	UKHO			
GB300727	3	90000	Peros Banhos to Blenheim Reef including Nelsons Island	UKHO			

