



ENC COVERAGE FOR THE MACHC REGION

MACHC ELECTRONIC CHART COMMITTEE
WORKING GROUP 2



DECEMBER
2010

REPORT OF THE MACHC ELECTRONIC CHART COMMITTEE
WORKING GROUP 2

ENC Coverage for the MACHC Region

SUBMITTED TO THE XITH MACHC MEETING
NOVEMBER 2010, SURINAME

UPDATED DECEMBER, 2010

The purpose of the Meso American and Caribbean Sea Hydrographic Commission's (MACHC) Electronic Chart Committee Working Group 2 (ECC/WG2) is to facilitate the production and promote the availability of official electronic chart data for safe, efficient, and environmentally sensitive maritime navigation within the MACHC Region.

In order to ensure that adequate regional ENC coverage will be available to meet IMO ECDIS carriage requirements in a timely manner, the MACHC ECC was tasked at the 10th MACHC conference (November 2009, Barbados) to assess ENC coverage and develop an ENC scheme (see Resolutions and Actions MACHC 10-30 to 10-35). The MACHC endorsed the goal of the ECC/WG2 to:

"Achieve adequate regional ENC coverage by December 31, 2010 (using the medium scale INT Chart Scheme as the baseline for adequate medium scale ENC coverage--usage bands 2/3)."

For the purpose of assessing coverage in the region, adequate ENC coverage is considered attained when "those ENCs required to enable safe port-to-port navigation for international shipping that correspond to the paper chart coverage for these ports and the routes between are produced and available."¹

This report and its annexes summarize the status of ENC coverage for the MACHC region, depicts a regional ENC scheme (Annex A) agreed to by the MACHC Member States in a format similar to that of the paper INT Chart Scheme found in Ed. 2.003 of S-11, and contains recommendations for future action.

BACKGROUND

Several drivers, explained below, have heightened the need for the successful completion of the ECC/WG2 work program.

INTERNATIONAL MARITIME ORGANIZATION CARRIAGE REQUIREMENTS

In 2009, the International Maritime Organization (IMO) announced the six-year timeframe for implementing ECDIS as a carriage requirement for large passenger, tanker, and cargo ships from the year 2012, according to the following timeline:

¹ This definition was adopted in October 2007 at an extraordinary meeting of the IHO WEND Committee to specifically consider matters arising from IMO/NAV53. It was subsequently communicated at NAV54 in April 2008.

- new passenger ships above 500GT, from July 1, 2012
- new tankers above 3,000GT, from July 1, 2012
- new cargo ships above 10,000GT, from July 1, 2013
- new cargo ships above 3,000GT, from July 1, 2014

IHO CONFERENCE DECISIONS

At its 17th International Hydrographic Conference in May 2007, the IHO adopted two resolutions:

IHO Member States should adhere and comply with the IHO's Worldwide Electronic Navigational Database (WEND) principles, which provide technical details and procedures, in order to achieve adequate coverage, availability, consistency and quality of ENC's by 2010.

The IHO strongly supports the efforts by IMO to introduce mandatory carriage requirements for ECDIS, emphasizing that a significant coverage of ENC's is already in place and will be further improved by 2010, as indicated in the Det Norske Veritas report (NAV 53/INF.3) and supported by IHO assessments.

IHO WEND PRINCIPLES

The purpose of WEND is to ensure that high-quality, updated, official ENC's are provided through integrated services that support chart carriage requirements of SOLAS Chapter V². According to the IMO performance standards for ECDIS:

- Member States will strive to ensure that mariners, anywhere in the world, can obtain fully updated ENC's for all shipping routes and ports across the world.
- Member States will strive to ensure that their ENC data are available to users through integrated services, each accessible to any ECDIS user (i.e., providing data in S-57 form), in addition to any national distribution or system-specific SENC delivery.
- Member States are encouraged to distribute their ENC's through an RENC in order to share in common experience and reduce expenditure, and to ensure the greatest possible standardization, consistency, reliability, and availability of ENC's.

In response to these drivers, the ECC recognized the need to improve regional ENC coverage in the short- to medium-term, and encouraged national hydrographic offices to produce and distribute ENC's that will improve maritime and environmental safety. This year, the ECC focused its efforts on medium-scale (Usage Bands 2 and 3) ENC's, based on the equivalent medium scale (1:300,000, 1:400,000, 1:500,000-scale) INT Chart Schemes in the Caribbean Sea and Atlantic side of the region.³

² SOLAS Chapter V, Regulation 9, requires Contracting Governments to ensure that hydrographic data are available in a suitable manner in order to satisfy the needs of safe navigation. Once the carriage of ECDIS becomes mandatory, there will be a consequential requirement to ensure that such data, as agreed by IMO, are available in a form suitable for use in ECDIS.

³ Information on Usage Band 1 is included in Annex A for reference purposes.

WORK PLAN AND PROCESS

At the 2009 MACHC meeting, the ECC/WG2 agreed to:

- utilize the INT Chart Scheme as the “footprint” to guide ENC construction/coverage of the MACHC Region;
- assess present MACHC Region ENC coverage in comparison with the “footprint;”
- coordinate action plans for addressing gaps and overlaps in ENC coverage between countries; and
- establish a communication strategy to track progress and resolve issues.

The ECC/WG2 participants developed a work plan (see Annex C). The Group held three conference calls (February 24, May 26, and September 14) and one face-to-face meeting on June 16 in New Orleans, USA. Between calls and meetings, participants used e-mail and a Google group, where all WG documents were posted for review and discussion. The meeting results are also archived on the MACHC website at: http://www.iho-machc.org/documents/ecctg2_doc.html#A.

DATA ANALYSIS METHODOLOGY

To successfully and accurately report on regional ENC coverage, and to appropriately plan to address regional ENC deficiencies, the UKHO and the ECC/WG2’s technical coordinator produced a baseline assessment of regional ENC coverage by breaking this assessment into two components: officially distributed data; and data not yet distributed. The UKHO first assessed regional Usage Bands 1, 2, and 3 ENC coverage for ENCs currently distributed through the Regional Electronic Navigational Chart Coordinating Center (RENC) and compared it to the data footprint of the small to medium scale INT Charts for the MACHC Region. Then the UKHO analyzed Usage Bands 1, 2, and 3 ENC coverage for ENCs produced, but *not* currently distributed through the RENC, and compared that to the data footprint of the small to medium scale INT Charts for the MACHC Region.

In the baseline assessment, the UKHO adhered to a pre-defined set of guidelines (Annex D) for ENC analysis. The guidelines required the identification and documentation of ENC deficiencies, such as:

- gaps in planned ENC coverage;
- overlapping ENCs within the same Usage Band between MACHC Member States;
- overlapping same Usage Band ENCs within national suites; and
- other data anomalies that could affect the use of ENCs in ECDIS.

The UKHO documented this information and, in conjunction with the ECC’s technical coordinator, delivered this report to representatives of ECC Member States before its June 16 meeting in New Orleans, USA.

PROGRESS ON MS REGIONAL ENC ACTIONS

At the June 16 meeting, Member State representatives developed detailed action plans (see Annex B), which were subsequently implemented, to address these deficiencies. Due to time constraints at that meeting, the Group focused on the overlaps and gaps between nations. However, the national deficiencies identified in the analysis, such as internal gaps, overlaps, and ENC scales that appear inconsistent with IHO recommended navigational purpose designations⁴, are receiving ongoing attention by the respective Member Countries.

CONCLUSION

The ECC/WG2 has made significant progress towards its goal to “ensure adequate regional ENC coverage (Usage Bands 2 and 3) by December 31, 2010, using the medium scale INT Chart Scheme as the baseline for adequate medium scale ENC coverage.” The Group established a regional scheme (see Annex A) that shows ENC coverage along with a tabulation of ENC cells and status, based on the format of the paper INT Chart Scheme found in Ed. 2.003 of S-11. The tables in Annex A identify ENCs that are currently distributed, as well as the anticipated distribution dates of those not yet available for use by the mariner.

The table below shows ENC Coverage for the region by Usage Bands:

| Usage Band | TOTAL CELLS | Cells currently available | Cells available by December 2010 | Cells available by December 2011 |
|----------------------------------|-------------|---------------------------|----------------------------------|----------------------------------|
| Usage Band 1 | 10 | 10 | 10 | 10 |
| | | 100% | 100% | 100% |
| Usage Band 2 | 29 | 21 | 22 | 29 |
| | | 72% | 76% | 100% |
| Usage Band 3 | 104 | 55 | 60 | 104 |
| | | 53% | 58% | 100% |
| All Usage Bands (Bands 1, 2 & 3) | 143 | 86 | 92 | 143 |
| | | 60% | 64% | 100% |

When all of the ENCs identified in the scheme are officially distributed, the region will technically meet the definition of “adequate” coverage, i.e., where there is a paper chart, (as identified in the INT Chart footprint) there is a corresponding ENC. However, the Group acknowledges that adequate coverage is not necessarily optimal. For example, there is a significant gap in Usage Band 3 coverage for Haiti, both

⁴ As per IHO Circular Letter 31-2007 and Standard Publication S-66, page 33.

for paper and electronic charts. This gap should receive particular focus for MACHC capacity building efforts.⁵

The Group further acknowledges that some Member States may encounter circumstances, despite their best intentions, which may preclude them from completing their planned ENC coverage. These circumstances may include technical issues, resource constraints, or capacity-building setbacks.

RECOMMENDATIONS

The Working Group makes the following recommendations for 2011:

1. MACHC ECC finalizes/completes the Region B, Atlantic Ocean side, ENC scheme for small to medium scales (UB2 to UB3), per the timetables indicated in Annex A.
2. MACHC ECC develops the Region B, Pacific side, ENC scheme for small to medium scales (UB1 to UB3).
3. MACHC ECC explores options for providing a means to depict ENC schemes on a webpage in an interoperable manner and appropriate format for GIS, as a pilot project. Additionally it should allow MACHC ENC schemes to be uploaded into a web service application for the MACHC Region and allow for easy updating by MACHC Members.
4. MACHC ECC corresponds with WEND-WG RHC representatives to ensure that ENC schemes fit seamlessly with adjacent areas, i.e. SEPHC, USCHC.
5. As a permanent task, MACHC Member States are invited to provide the ECC with their UB4 to UB6 production plans taking into account:
 - the need to cover the routes used by High Speed Crafts (ECDIS mandatory carriage July 1, 2010) and priority regional ports;
 - the availability of adequate survey data for ENC production (keeping in mind that, in some areas, hydrographic offices may not produce ENCs if data are out-of-date or not compliant with S-44 standards); and
 - the need to address national overlaps and consistency for all Usage Bands.
6. MACHC Chair is invited to provide this report to the International Hydrographic Bureau (IHB) as the region's contribution to global ENC coverage so that it may be conveyed accordingly to the IMO.
7. In order to create the IHO worldwide ENC database, all ENC producers are encouraged to make their ENCs available to the Regional Electronic Navigational Chart Coordinating Centers, even if they are distributed by different channels.

⁵ At the 11th MACHC Conference, the Capacity Building Committee developed and approved a targeted implementation plan to support Haiti's capacity building requirements.

8. If Member Countries are unable to complete their ENC coverage in 2011, the MACHC should consider options to address this situation, ranging from focused capacity building assistance to identification of interim producers (other nations) until the nation concerned is able to do it themselves.

9. If MACHC Member States are unwilling either to distribute ENCs or to have another country produce ENCs for them, this situation will be communicated via the MACHC Chair to the IRCC. The IRCC will take appropriate action with the WEND Working Group, the IHB, and IMO.

ACTIONS REQUIRED OF THE MACHC

MACHC Member States are invited to note and endorse this report and its recommendations.⁶ We request that the MACHC Chair then transmit the report to the IHB no later than December 31, 2010, for ultimate communication of the results to the IMO.

ANNEXES

A: MACHC ENC Scheme

B: Member States Actions Addressing Scheme Gaps/Overlaps

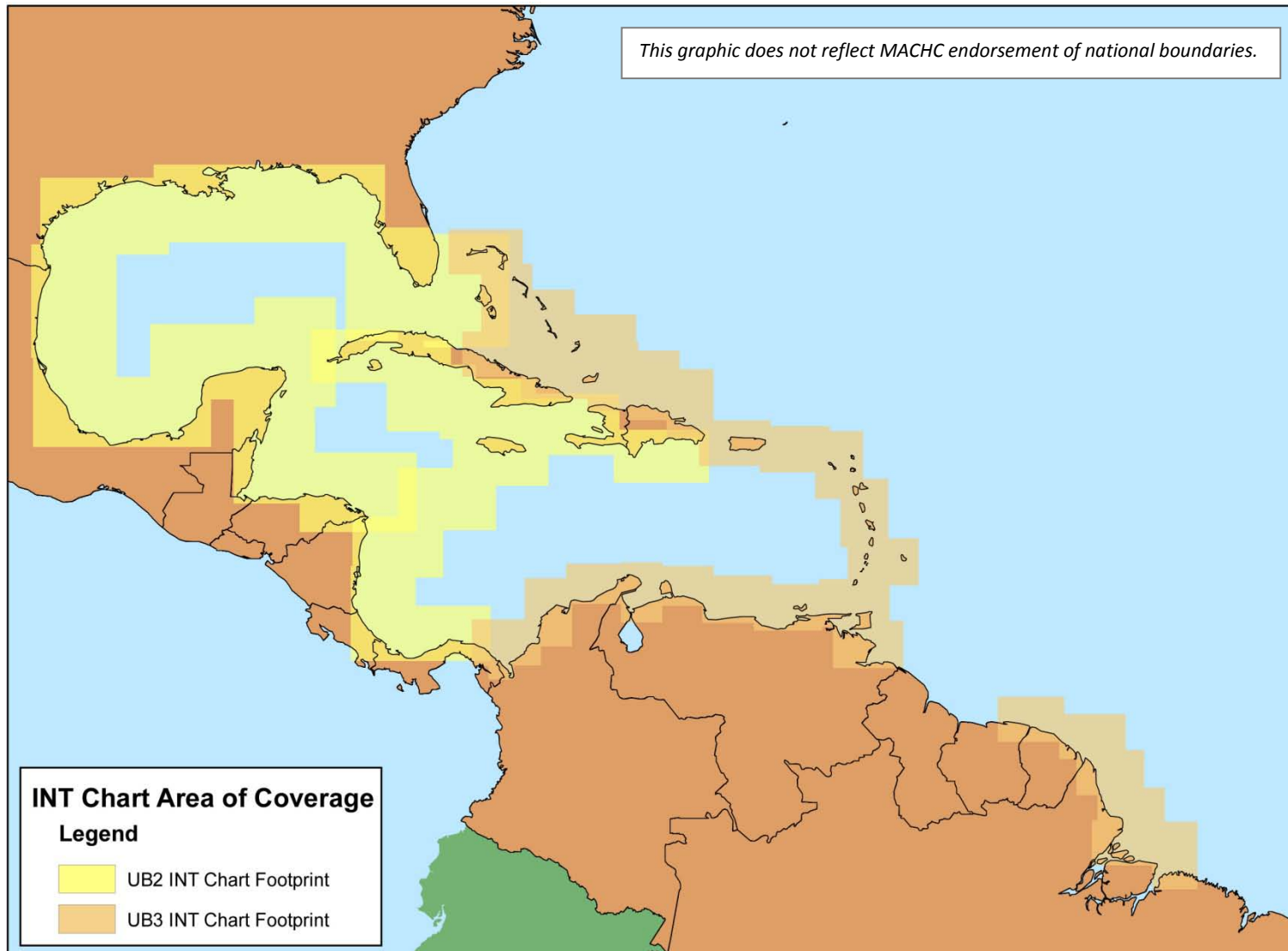
C: Work Plan Milestones

D: Guidelines for Analyzing M_Covr

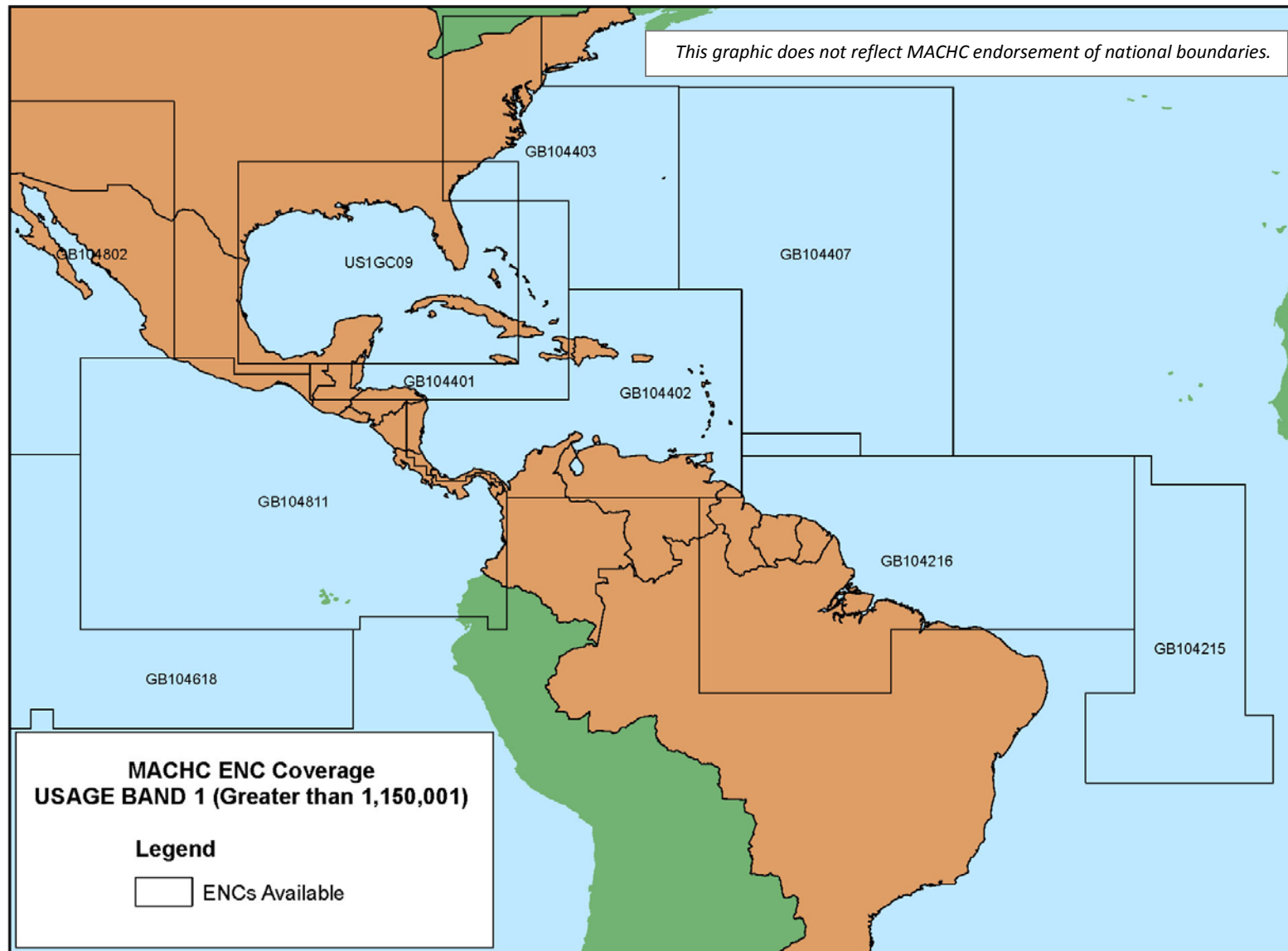
E: List of WG Participants

⁶ This report was endorsed by Member States at the 11th MACHC in Suriname, November 2010.

ANNEX A.1



ANNEX A.2

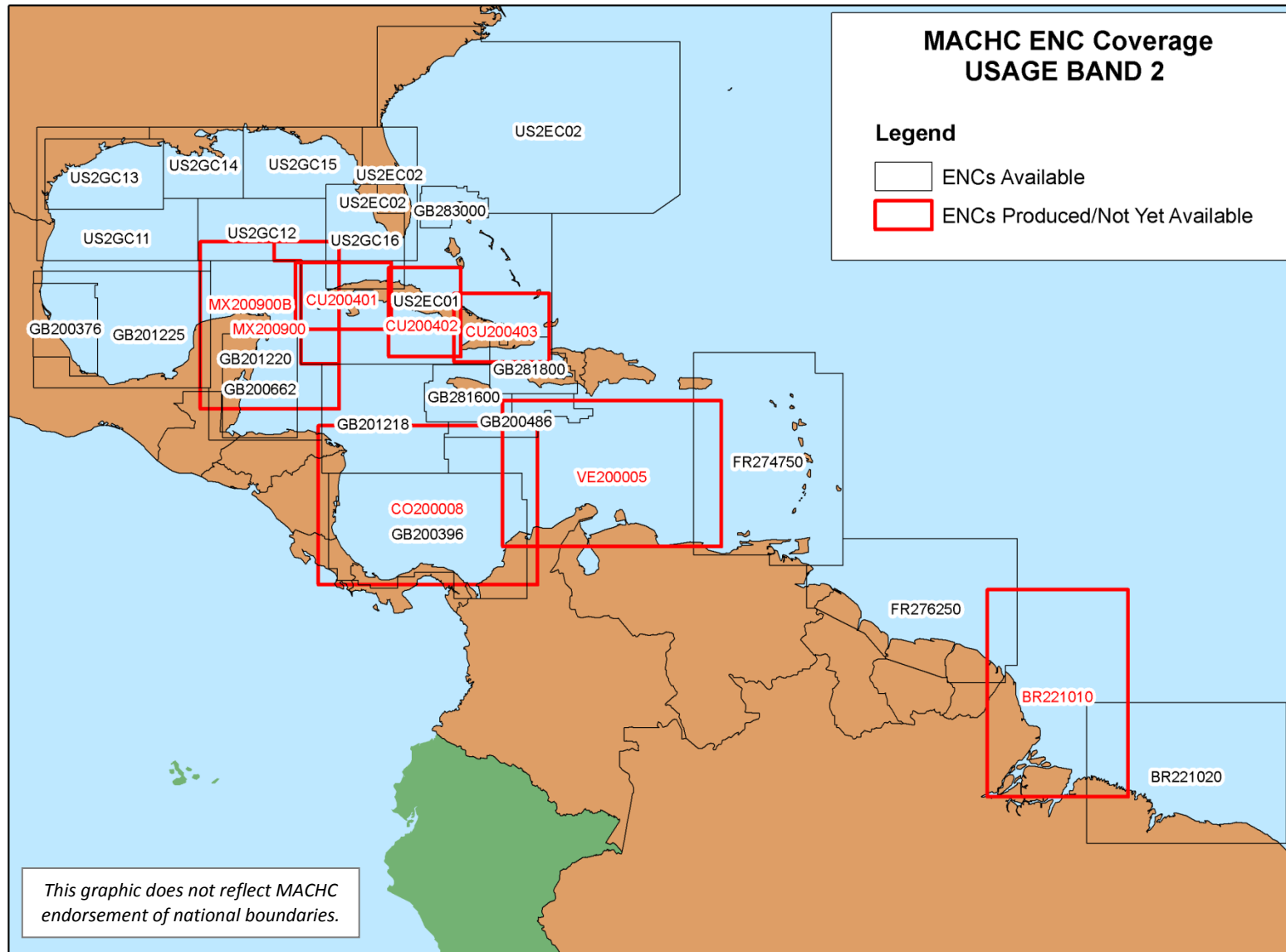


ANNEX A.3 – CATALOGUE OF ENC CELLS USAGE BAND 1 – MACHC REGION

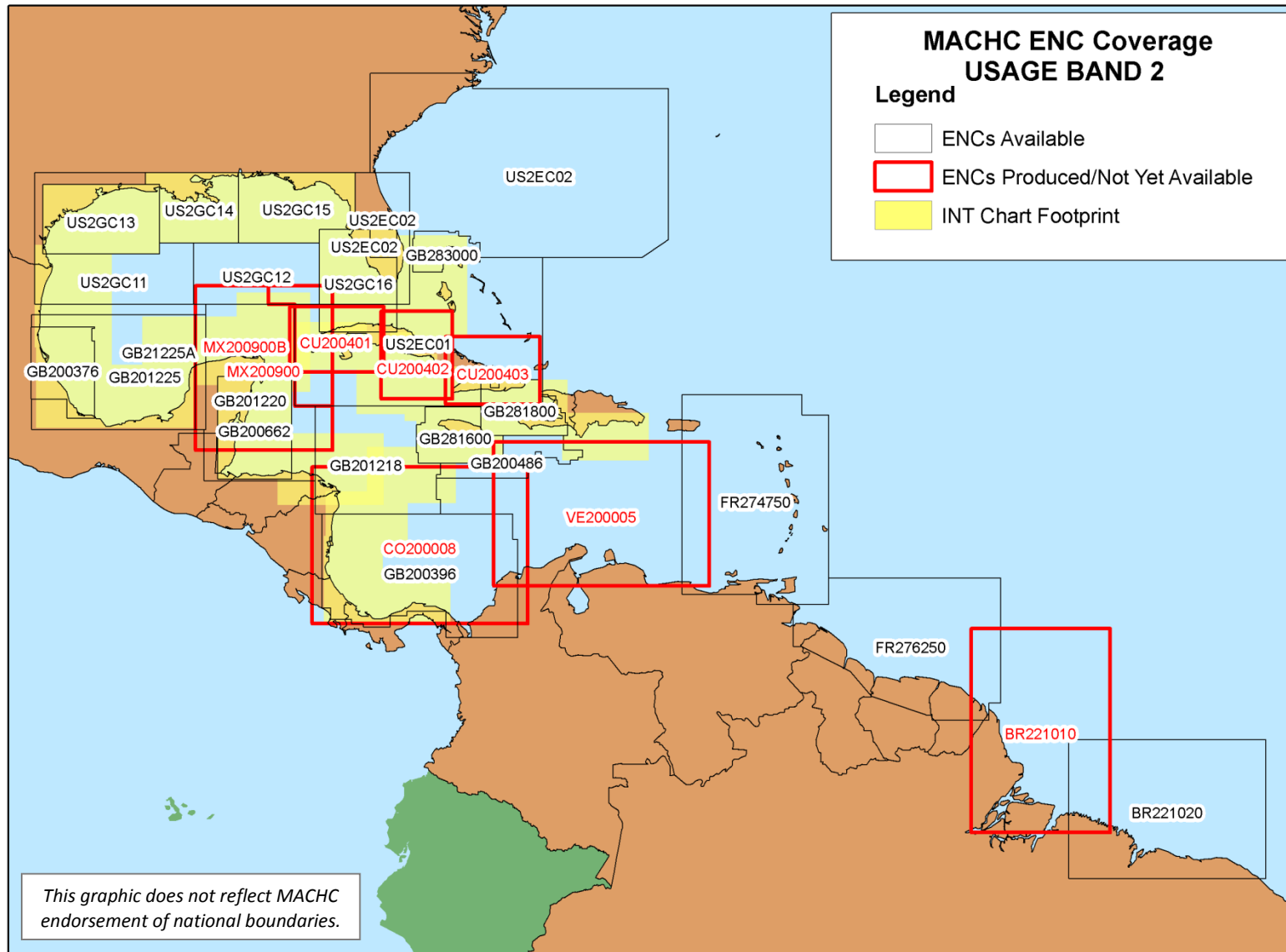
| Cell Name | Producing Auth | Title | Scale | Status | Distributed by |
|-----------|----------------|--|---------|-----------|-------------------|
| | | | 1: | | |
| GB104215 | UKHO | Atlantic Ocean - Gambia Basin to Brazil Basin | 3500000 | Available | EUSP [‡] |
| GB104216 | UKHO | Atlantic Ocean - North East Coast of South America | 3500000 | Available | IC-ENC |
| GB104401 | UKHO | North Atlantic Ocean - Gulf of Honduras to Haiti | 2750000 | Available | IC-ENC |
| GB104402 | UKHO | North Atlantic Ocean - Caribbean Sea | 1500000 | Available | IC-ENC |
| GB104403 | UKHO | North Atlantic Ocean - South East Coast of North America - Brunswick to Philadelphia including Bermuda | 3500000 | Available | IC-ENC |
| GB104407 | UKHO | North Atlantic Ocean - New England Seamounts to the Mid-Atlantic Ridge | 3500000 | Available | IC-ENC |
| GB104618 | UKHO | Clipperton Fracture Zone to Bauer Basin | 3500000 | Available | IC-ENC |
| GB104802 | UKHO | North Pacific Ocean - West Coast Of Mexico - Cabo San Quintin To Punta San Telmo | 3500000 | Available | IC-ENC |
| GB104811 | UKHO | Pacific Ocean - Central America - Mexico To Ecuador | 3500000 | Available | IC-ENC |
| US1GC09 | NOAA | Gulf Of Mexico | 2160000 | Available | NOAA |

[‡] End User Service Provider

ANNEX A.4



ANNEX A.5



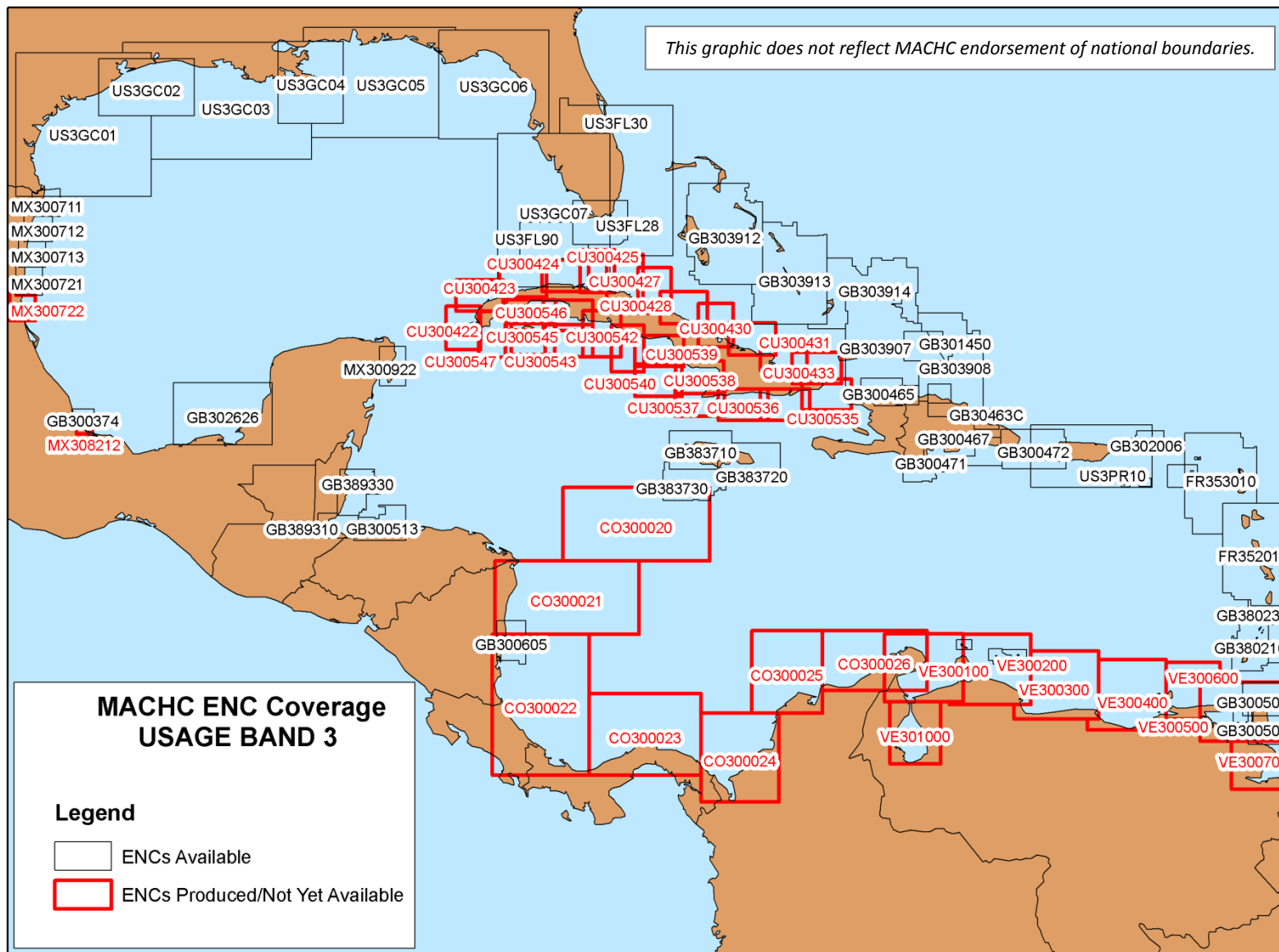
ANNEX A.6 – CATALOGUE OF ENC CELLS USAGE BAND 2 – MACHC REGION

| Cell Name | Producing Authority | Title | Scale | Status | Distributed by |
|-----------|---------------------|---|--------|------------|-------------------|
| | | | 1: | | |
| BR221010 | DHN | De Belém ao Cabo Guarirí | 700000 | Nov. 2011 | IC-ENC/ PRIMAR |
| BR221020 | DHN | De Salinópolis a Fortaleza | 700000 | Sept. 2011 | IC-ENC/ PRIMAR |
| CO200008 | CIOH | Carta General del Caribe Colombiano | 700000 | Dec. 2010 | IC-ENC |
| CU200401 | ONHG | Parte Occidental de Cuba | 350000 | Nov. 2011 | IC-ENC |
| CU200402 | ONHG | Parte Central de Cuba | 350000 | Nov. 2011 | IC-ENC |
| CU200403 | ONHG | Parte Oriental de Cuba | 350000 | Nov. 2011 | IC-ENC |
| FR274750 | SHOM | Puerto Rico to Trinidad | 700000 | Available | PRIMAR |
| FR276250 | SHOM | Delta Del Orinoco to Cayenne | 700000 | Available | PRIMAR |
| GB200376 | UKHO | Mexico – East Coast - Veracruz to Altamira | 350000 | Available | IC-ENC |
| GB200396 | UKHO | Caribbean Sea - Barranquilla to Miskito Bank | 700000 | Available | IC-ENC |
| GB200486 | UKHO | Bajo Nuevo to South of Haiti | 700000 | Available | IC-ENC |
| GB200662 | UKHO | Central America - East Coast - Isla de Guanaja to Isla Cozumel including the Gulf of Honduras | 350000 | Available | EUSP [‡] |
| GB201218 | UKHO | Caribbean Sea - Cuba to Miskito Bank | 700000 | Available | IC-ENC |
| GB201220 | UKHO | Gulf of Honduras | 700000 | Available | IC-ENC |
| GB201225 | UKHO | Gulf of Campeche | 700000 | Available | EUSP |
| GB21225A | UKHO | Gulf of Mexico Campeche | 700000 | Available | EUSP |
| GB281600 | UKHO | Approaches to Jamaica | 350000 | Available | IC-ENC |

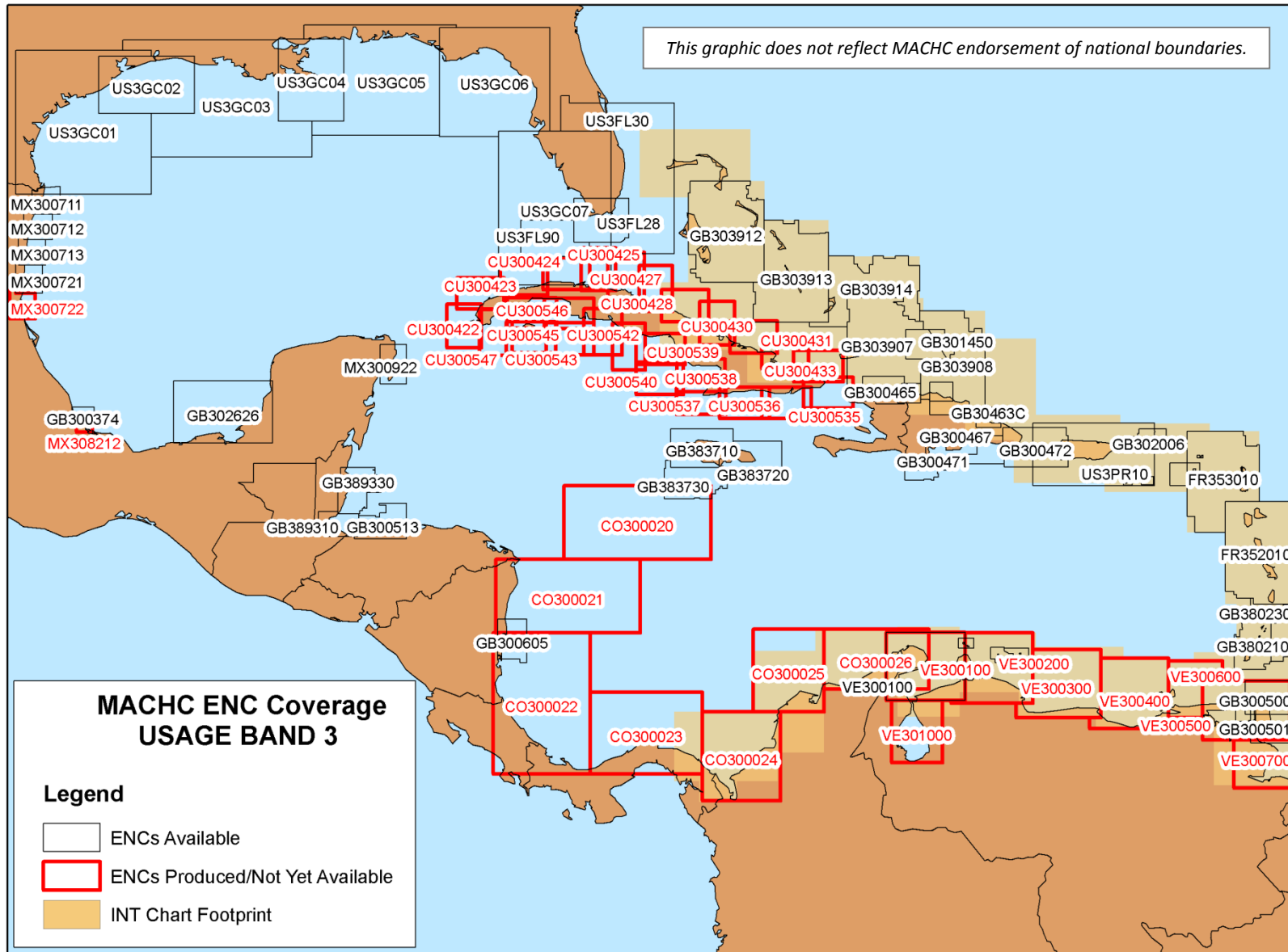
[‡] End User Service Provider

| Cell Name | Producing Authority | Title | Scale | Status | Distributed by |
|-----------|---------------------|--|---------|--|----------------|
| | | | 1: | | |
| GB281800 | UKHO | Windward Passage and Southern Approaches. | 350000 | Available | EUSP |
| GB283000 | UKHO | Bahamas - Little Bahama Bank including North West Providence Channel | 180000 | Available | IC-ENC |
| MX200900 | SEMAR | Canal de Yucatan y Proximidades | TBD | Produced/not yet available; expected by 12/10 | SEMAR |
| US2EC01 | NOAA | Straits of Florida and Approaches | 1200000 | Available | NOAA |
| US2EC02 | NOAA | Cape Hatteras to Straits of Florida | 1200000 | Available | NOAA |
| US2GC11 | NOAA | Mobile Bay to Mexico | 1000000 | Available | NOAA |
| US2GC12 | NOAA | New Orleans to Jacksonville | 1000000 | Available | NOAA |
| US2GC13 | NOAA | Vermilion Bay to Corpus Christi | 500000 | Available | NOAA |
| US2GC14 | NOAA | Louisiana | 500000 | Available | NOAA |
| US2GC15 | NOAA | Tampa Bay to Mobile | 500000 | Available | NOAA |
| US2GC16 | NOAA | Tampa Bay to Cuba | 500000 | Available | NOAA |
| VE200005 | DHN | Cabo Codera a Punta Canoas e Islas Adyacentes | 700000 | Produced in Mar. 2011; distributed Apr. 2011 | IC-ENC |

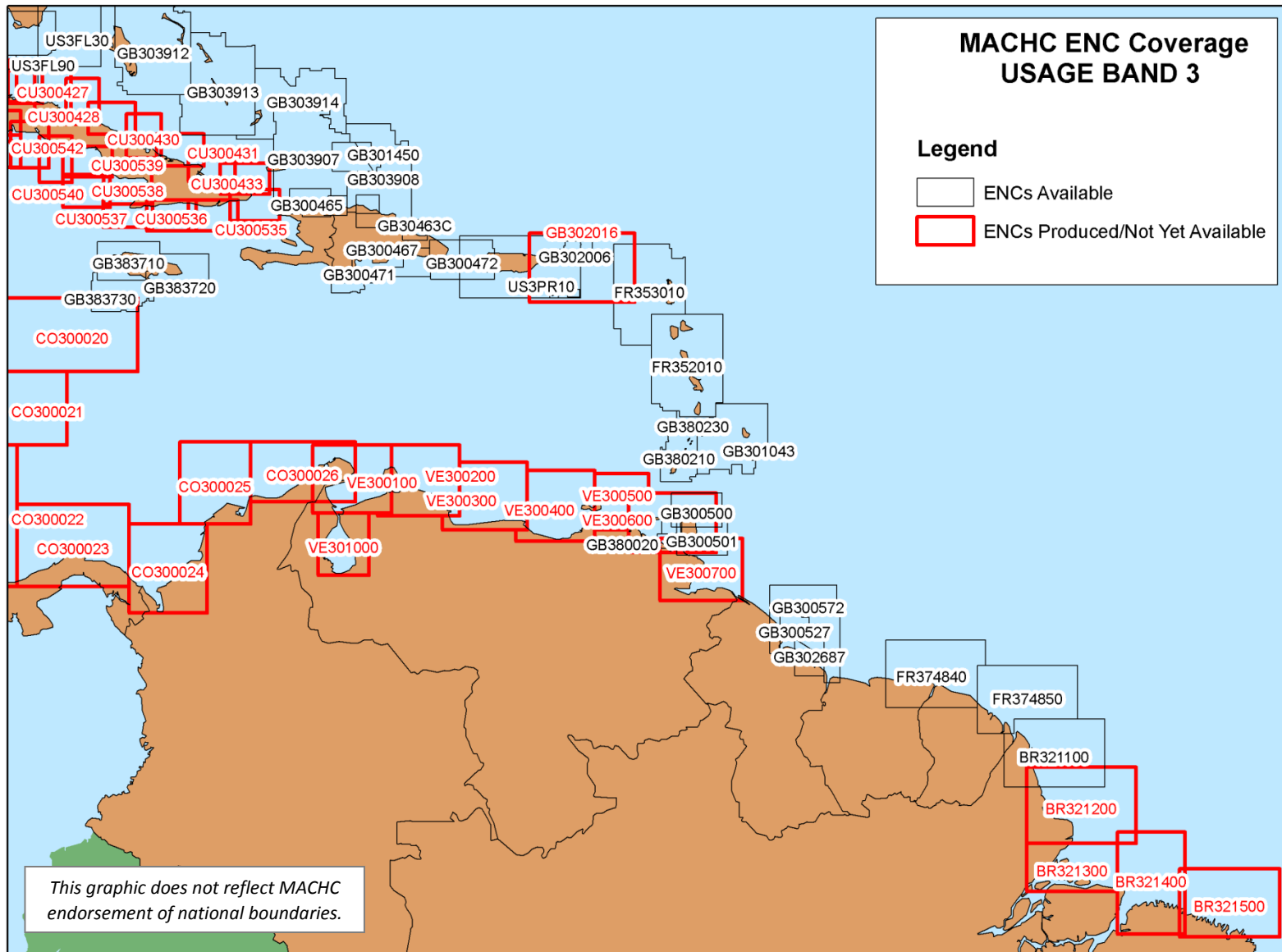
ANNEX A.7



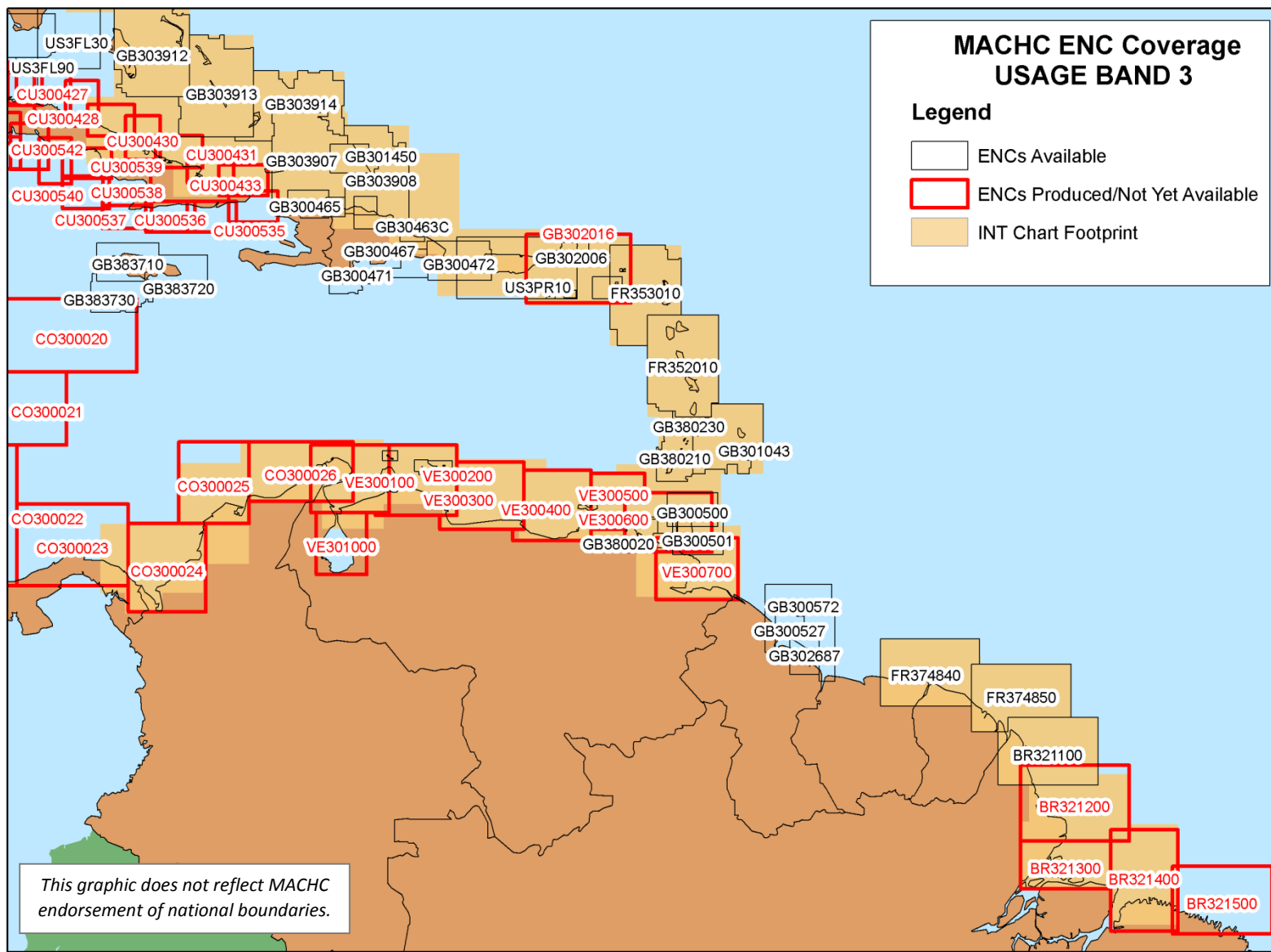
ANNEX A.8



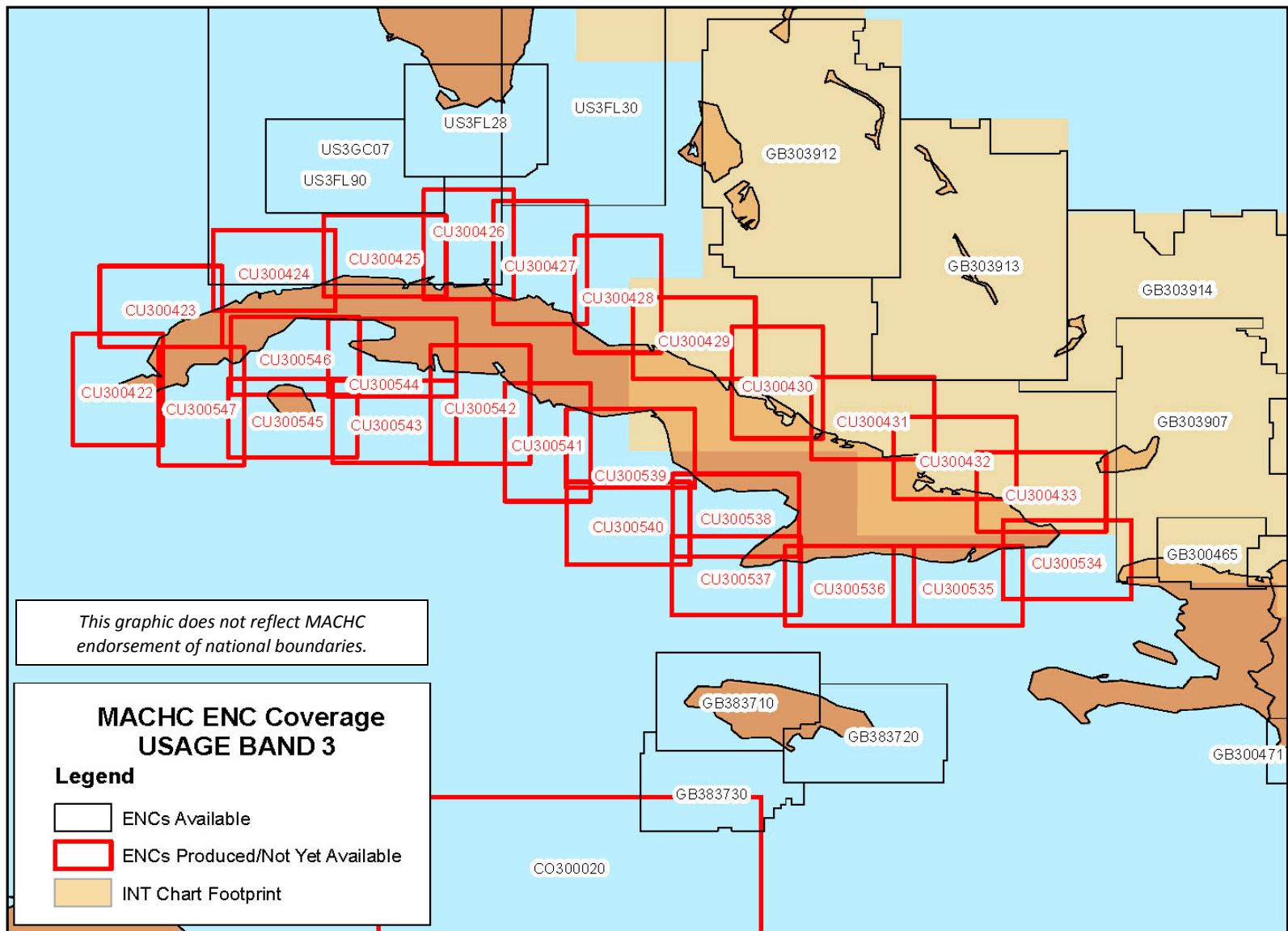
ANNEX A.9



ANNEX A.10



ANNEX A.11



ANNEX A.12 – CATALOGUE OF ENC CELLS USAGE BAND 3 – MACHC REGION

| Cell Name | Producing Authority | Title | Scale | Status | Distributed by |
|-----------|---------------------|---|--------|------------|-------------------|
| | | | 1: | | |
| BR321100 | DHN | Do Cabo Orange a Ponta Cambu | 180000 | March 2010 | IC-ENC/ PRIMAR |
| BR321200 | DHN | Do Rio Calçoene a Ilha Sipioca | 180000 | Nov. 2011 | IC-ENC/ PRIMAR |
| BR321300 | DHN | Do Rio Araguari a Ilha das Flechas | 180000 | Nov. 2011 | IC-ENC/ PRIMAR |
| BR321400 | DHN | Do Machadinho a Ponta Quatipuru | 180000 | Nov. 2011 | IC-ENC/ PRIMAR |
| BR321500 | DHN | Da Ponta Boiuçucanga a Ponta do Zumbi | 180000 | Nov. 2011 | IC-ENC/ PRIMAR |
| CO300020 | CIOH | Pedro Bank a Quitasueño | 180000 | Dec. 2010 | IC-ENC |
| CO300021 | CIOH | Cabo Gracias a Dios a Isla de Providencia | 180000 | Dec. 2010 | IC-ENC |
| CO300022 | CIOH | Isla de San Andrés a Golfo de Morrosquillo | 180000 | Dec. 2010 | IC-ENC |
| CO300023 | CIOH | Golfo de los Mosquito a Punta Mosquito | 180000 | Dec. 2010 | IC-ENC |
| CO300024 | CIOH | Archipiélago de San Blas a Bahía de Cartagena | 180000 | Dec. 2010 | IC-ENC |
| CO300025 | CIOH | Isla Fuerte a Santa Marta | 180000 | Dec. 2010 | IC-ENC |
| CO300026 | CIOH | Santa Marta a Punta Gallinas | 180000 | Dec. 2010 | IC-ENC |
| CU300422 | ONHG | De Cabo Corrientes a Cayo Buenavista | 90000 | Nov. 2011 | IC-ENC |
| CU300423 | ONHG | De Cayo Buenavista a Cayo Arenas | 90000 | Nov. 2011 | IC-ENC |
| CU300424 | ONHG | De Cayo Arenas a la Bahía de La Habana | 90000 | Nov. 2011 | IC-ENC |
| CU300425 | ONHG | Bahía de La Habana a la Bahía de Cárdenas | 90000 | Nov. 2011 | IC-ENC |
| CU300426 | ONHG | De la Bahía de Cárdenas a Cayo Bahía de Cádiz | 90000 | Nov. 2011 | IC-ENC |

| Cell Name | Producing Authority | Title | Scale | Status | Distributed by |
|-----------|---------------------|---|-------|-----------|----------------|
| | | | 1: | | |
| CU300427 | ONHG | De Cayo Bahía de Cádiz a Cayo Fragoso | 90000 | Nov. 2011 | IC-ENC |
| CU300428 | ONHG | De Cayo Fragoso a Cayo Guillermo | 90000 | Nov. 2011 | IC-ENC |
| CU300429 | ONHG | De Cayería Los Caimanes a Cayo Verde | 90000 | Nov. 2011 | IC-ENC |
| CU300430 | ONHG | De Cayo Confities a la Bahía de Manatí | 90000 | Nov. 2011 | IC-ENC |
| CU300431 | ONHG | De la Bahía de Manatí a Punta Lucrecia | 90000 | Nov. 2011 | IC-ENC |
| CU300432 | ONHG | De la Bahía de Vita a Bahía de Cayo Moa | 90000 | Nov. 2011 | IC-ENC |
| CU300433 | ONHG | De Bahía de Cayo Moa a Maisí | 90000 | Nov. 2011 | IC-ENC |
| CU300534 | ONHG | De Maisí a Punta Imías. Paso de los Vientos | 90000 | Nov. 2011 | IC-ENC |
| CU300535 | ONHG | De Punta Imías a la Bahía de Santiago de Cuba | 90000 | Nov. 2011 | IC-ENC |
| CU300536 | ONHG | De la Bahía de Santiago de Cuba a Marea del Portillo | 90000 | Nov. 2011 | IC-ENC |
| CU300537 | ONHG | De Marea del Portillo al Canal de Madrona | 90000 | Nov. 2011 | IC-ENC |
| CU300538 | ONHG | Golfo de Guacanayabo | 90000 | Nov. 2011 | IC-ENC |
| CU300539 | ONHG | De Canal del Pingüe a Tunas de Zaza | 90000 | Nov. 2011 | IC-ENC |
| CU300540 | ONHG | De Punta Cabeza del Este a Cayo Anclitas | 90000 | Nov. 2011 | IC-ENC |
| CU300541 | ONHG | De Cayo Bretón a Punta San Juan | 90000 | Nov. 2011 | IC-ENC |
| CU300542 | ONHG | De Yaguanabo a Bahía de Cochinos | 90000 | Nov. 2011 | IC-ENC |
| CU300543 | ONHG | De Cayo Guano del Este a Cayo Ávalos | 90000 | Nov. 2011 | IC-ENC |
| CU300544 | ONHG | De la Bahía de Cochinos al Surgidero de Batabanó | 90000 | Nov. 2011 | IC-ENC |
| CU300545 | ONHG | De Cayo Avalos a los Cayos de San Felipe (Incluyendo Isla de la Juventud) | 90000 | Nov. 2011 | IC-ENC |
| CU300546 | ONHG | Golfo de Batabanó | 90000 | Nov. 2011 | IC-ENC |

| Cell Name | Producing Authority | Title | Scale | Status | Distributed by |
|-----------|---------------------|--|--------|------------|-------------------|
| | | | 1: | | |
| CU300547 | ONHG | De Cayos de San Felipe a Cabo Frances | 90000 | Nov. 2011 | IC-ENC |
| FR352010 | SHOM | Monserrat to Saint Lucia | 304405 | Available | PRIMAR |
| FR353010 | SHOM | Anguilla to Monserrat | 301202 | Available | PRIMAR |
| FR374840 | SHOM | Iles du Salut to Baie de l'Oyapok | 299000 | Oct. 2010 | PRIMAR |
| FR374850 | SHOM | Paramaribo to Iles du Salut | 299000 | Sept. 2010 | PRIMAR |
| GB300374 | UKHO | Mexico - East Coast - Punta El Coyol to Punta Zempoala | 90000 | Available | EUSP [‡] |
| GB300465 | UKHO | West Indies - Haiti - Baie Caracol to Ile de la Tortue | 180000 | Available | IC-ENC |
| GB300467 | UKHO | West Indies - Dominican Republic - Isla Catalina to Boca Chica | 180000 | Available | EUSP |
| GB300471 | UKHO | Dominican Republic - South Coast - Cabo Caucedo to Isla Alto Velo | 180000 | Available | EUSP |
| GB300472 | UKHO | Dominican Republic and Puerto Rico - Mona Passage | 180000 | Available | EUSP |
| GB300500 | UKHO | West Indies - North East Approaches to Trinidad | 90000 | Available | EUSP |
| GB300501 | UKHO | West Indies - South East Approaches to Trinidad | 90000 | Available | EUSP |
| GB300513 | UKHO | Central America - East Coast - Honduras - Isla de Roatan to Punta Ulua | 180000 | Available | EUSP |
| GB300527 | UKHO | Approaches to Demerara and Essequibo Rivers | 90000 | Available | IC-ENC |
| GB300572 | UKHO | South America - North-East Coast - Essequibo River to Corentyn River | 350000 | Available | IC-ENC |
| GB300605 | UKHO | False Bluefields to Man of War Cays | 90000 | Available | EUSP |
| GB301043 | UKHO | Barbados | 180000 | Available | IC-ENC |
| GB301450 | UKHO | Turks And Caicos Islands - Turks Island Passage And Mouchoir Passage | 90000 | Available | IC-ENC |
| GB302006 | UKHO | West Indies - Virgin Islands - Anegada to Saint Thomas | 90000 | Available | EUSP |

[‡] End User Service Provider

| Cell Name | Producing Authority | Title | Scale | Status | Distributed by |
|-----------|---------------------|--|--------|--------------------------------|----------------|
| | | | 1: | | |
| GB302016 | UKHO | West Indies - Puerto Rico to Leeward Islands | 180000 | In production February 2011 | IC-ENC |
| GB302626 | UKHO | Mexico – East Coast - Bay of Campeche | 180000 | Available | IC-ENC |
| GB302687 | UKHO | South America – Guyana – Approach to the Berbice River | 90000 | Available | IC-ENC |
| GB303907 | UKHO | Bahama Islands And Hispaniola - Passages between Mayaguana Island & Turks & Caicos Islands | 180000 | Available | IC-ENC |
| GB303908 | UKHO | West Indies - Passages between Turks & Caicos Islands & Dominican Republic | 180000 | Available | IC-ENC |
| GB303912 | UKHO | Bahamas - North East Providence Channel & Tongue of the Ocean | 180000 | Available | IC-ENC |
| GB303913 | UKHO | Bahamas - Crooked Island Passage & Exuma Sound | 180000 | Available | IC-ENC |
| GB303914 | UKHO | Bahamas - North East Approaches to Acklins Island & Samana Cay | 180000 | Available | IC-ENC |
| GB30463A | UKHO | West Indies - Dominican Republic - North Coast - Punta Cabarete to Punta Brimball | 180000 | Available | IC-ENC |
| GB30463B | UKHO | West Indies - Dominican Republic - North Coast - Punta Mangle to Pointe Yaguezi | 350100 | Available | IC-ENC |
| GB30463C | UKHO | Plans on the North Coast of the Dominican Republic - Bahia de Samana and Approaches | 180000 | Available | EUSP |
| GB380020 | UKHO | Trinidad and Venezuela - Serpent's Mouth | 90000 | Available | EUSP |
| GB380040 | UKHO | Trinidad and Venezuela - Gulf of Paria | 90000 | Available | EUSP |
| GB380210 | UKHO | West Indies - Saint Vincent to Grenada | 90000 | Available | IC-ENC |
| GB380230 | UKHO | West Indies - Southern St Lucia to Northern St Vincent | 90000 | Available | IC-ENC |
| GB383710 | UKHO | West Indies - Western Approaches to Jamaica | 180000 | Available | IC-ENC |
| GB383720 | UKHO | West Indies - Eastern Approaches to Jamaica | 180000 | Available | IC-ENC |
| GB383730 | UKHO | West Indies - Pedro Bank to the South Coast of Jamaica | 180000 | Available | IC-ENC |
| GB389100 | UKHO | Panama - Gulf of Panama | 180000 | Available | IC-ENC |

| Cell Name | Producing Authority | Title | Scale | Status | Distributed by |
|-----------|---------------------|---|---------|--------------------------------|----------------|
| | | | 1: | | |
| GB389310 | UKHO | Central America - East Coast - Gulf of Honduras | 180000 | Available | IC-ENC |
| GB389320 | UKHO | Belize - Monkey River to Colson Point | 90000 | Available | IC-ENC |
| GB389330 | UKHO | Belize - Colson Point to Belize City | 90000 | Available | IC-ENC |
| MX300711 | SEMAR | Brazos Santiago a El Mezquital | 100000 | Available | IC-ENC |
| MX300712 | SEMAR | El Mezquital a Boca Jesus Maria | 100000 | Available | IC-ENC |
| MX300713 | SEMAR | Boca Jesus Maria a La Pesca | 100000 | Available | IC-ENC |
| MX300721 | SEMAR | La Pesca a Punta Jerez | 100000 | Available | IC-ENC |
| MX300722 | SEMAR | Punta Jerez a Tampico | 100000 | Produced/ not yet available | IC-ENC |
| MX308212 | SEMAR | Veracruz a Puerto de Alvarado | 60000 | Produced/ not yet available | IC-ENC |
| MX300922 | SEMAR | Isla Mujeres a Isla Cozumel | 1000000 | Available | IC-ENC |
| US3FL28 | NOAA | Fowey Rocks to American Shoal | 180000 | Available | NOAA |
| US3FL30 | NOAA | Cape Canaveral to Key West | 466940 | Available | NOAA |
| US3FL90 | NOAA | Florida Keys Sombrero Key to Dry Tortugas | 180000 | Available | NOAA |
| US3GC01 | NOAA | Galveston to Rio Grande | 460732 | Available | NOAA |
| US3GC02 | NOAA | Mermentau River to Freeport | 250000 | Available | NOAA |
| US3GC03 | NOAA | Mississippi River to Galveston | 458596 | Available | NOAA |
| US3GC04 | NOAA | Approaches to Mississippi River | 250000 | Available | NOAA |
| US3GC05 | NOAA | Cape St. George to Mississippi Passes | 456394 | Available | NOAA |
| US3GC06 | NOAA | Tampa Bay to Cape San Blas | 456394 | Available | NOAA |

| Cell Name | Producing Authority | Title | Scale | Status | Distributed by |
|-----------|---------------------|--------------------------------|--------|---|----------------|
| | | | 1: | | |
| US3GC07 | NOAA | Havana to Tampa Bay | 470940 | Available | NOAA |
| US3PR10 | NOAA | Puerto Rico And Virgin Islands | 326856 | Available | NOAA |
| VE300100 | DHN | Golfo de Venezuela | 80000 | Produced in Dec. 2010; distributed in Jan. 2011 | IC-ENC |
| VE300200 | DHN | Punta Cardon a Tucacas | 80000 | Produced in Dec. 2010; distributed in Jan. 2011 | IC-ENC |
| VE300300 | DHN | Punta San Juan a Cabo Codera | 80000 | Produced in Dec. 2010; distributed in Jan. 2011 | IC-ENC |
| VE300400 | DHN | Cabo Codera a Cumana | 80000 | Produced in Dec. 2010; distributed in Jan. 2011 | IC-ENC |
| VE300500 | DHN | Cumaná a Cabo Tres Puntas | 80000 | Produced in Dec. 2010; distributed in Jan. 2011 | IC-ENC |
| VE300600 | DHN | Golfo de Paria | 180000 | Produced in Dec. 2010; distributed in Jan. 2011 | IC-ENC |
| VE300700 | DHN | Delta del Orinoco | 180000 | Produced in Dec. 2010; distributed in Jan. 2011 | IC-ENC |
| VE301000 | DHN | Lago de Maracaibo | 180000 | Produced in Dec. 2010; distributed in Jan. 2011 | IC-ENC |

ANNEX B.1 - MEMBER STATES ACTIONS ADDRESSING GAPS

| Responsible Member States | Data Discrepancy/ Usage Band/ Datum Issues | Affected Cells | Status | Status Statement | Completion Date |
|---------------------------|--|--|--|---|--|
| UB2 Gaps | | | | | |
| Brazil (UB2) | Gap (Area between FR 250010 and BR 221020) | BR221010 | Resolved | Already covered by Brazilian Cell BR221010. | Completed. Chart anticipated available Dec 2010 |
| | | FR 250010, FR276250 | Resolved | The new French cell is available. FR 250010 has been withdrawn and replaced by FR276250 and clipped at BR boundaries. | Completed |
| UB3 Gaps | | | | | |
| Venezuela | Guyana | Charts INT 4102 and INT 4100 | Resolved | <p>INT Charts INT 4102 and 4100 to be produced by VE. This means that equivalent cells should logically be produced by VE. ECC/MACHC Chair to propose to VE to produce equivalent ENC's clipped at the FR374840.</p> <p><i>Status update 8/23/10: After conferring with both France and Venezuela, there is no need to determine where to clip the cells, as they do not touch.</i></p> <p><i>VE to provide ENC cell limits (equivalents of INT Charts INT 4102 and 4100) to Chair ECC.</i></p> | Completed |
| Suriname Fr Guyana | Brazil | Gap (southward from Guyana, including Suriname, Fr Guyana to Brazil) | FR374840 and FR374850. BR321200; BR321300; BR321400 and BR321500 | Pending | <p>Covered by FR 374840 and FR374850. Cells will be clipped at the southern boundary of Brazil Cell BR 321100 , which is available.</p> <p>FR cells released in Oct 2010. BR321300, 321400 and 321500 cells to be released in 2010 and 2011.</p> |

| Responsible Member States | | Data Discrepancy/ Usage Band/ Datum Issues | Affected Cells | Status | Status Statement | Completion Date |
|---------------------------|--------|--|----------------|----------|---|-----------------|
| Colombia | | GAP (UB3) | CO200008 | Resolved | This cell will cover the gap; no need for a UB 3 cell in that area. | December 2010 |
| US | Mexico | Gap | US1GC09 | Resolved | Covered at scale band 1. | June 2010 |
| | | | MX300711 | Resolved | Coastal area covered at band 3 by Mexico. | June 2010 |
| | | | MX300712 | Resolved | Coastal area covered at band 3 by Mexico. | June 2010 |
| | | | MX300713 | Resolved | Coastal area covered at band 3 by Mexico. | June 2010 |
| | | | MX300721 | Resolved | Coastal area covered at band 3 by Mexico. | June 2010 |
| | | | | Resolved | MX will asses if UB1 (US1GC09) would be enough for this gap. | November 2010 |
| Cuba | | | | Pending | ECC Chair and UKHO representative continue efforts to engage Cuba, including requesting support from MACHC Chair, if necessary. | February 2011 |
| UK | | Gap Honduran coast | | Resolved | Covered by GB201220; GB300513 will cover North West side of Honduran coast for adequate usage band 3 coverage. | November 2010 |
| | | Gap for Haiti | | Resolved | Covered by GB281800. | November 2010 |

ANNEX B.2 - MEMBER STATES ACTIONS ADDRESSING OVERLAPS

| Affected Member States | | Data Discrepancy/ Usage Band/ Datum Issues | Affected Cells | | Status | Status Statement | Completion Date |
|------------------------|-----------|--|---|---------------------|----------|--|-----------------|
| Brazil | France | Overlap | BR221020 | FR276250 | Pending | Solved when BR221020 is made available. (FR 250010 has been withdrawn and replaced by FR276250 and clipped at BR boundaries.) | December 2010 |
| Colombia | Venezuela | Overlap | CO300026 | VE300100 | Proposal | CO and VE have exchanged proposals on suggested ENC boundary limits. At the MACHC XI meeting, a bi-national technical working group was established to address unresolved technical issues and to develop a recommendation for resolution that can be submitted for consideration to the higher authorities in each country. | Spring 2011 |
| Mexico | USA | Overlap | MX300711 | US3GC01M | Pending | Mexico will send M_Covr limits to U.S. (NOAA); U.S. will cut US3GC11 with MX300711. | December 2010 |
| UK USA Mexico | Cuba | Overlap | Various U.S.,UK, Mexico, Cuba Cells | (see Annex A.11) | Pending | U.S., UK, Mexico will develop proposed solution that ECC Chair can send to Cuba for consideration. Once approved and cells are available, solution will be implemented. | March 2011 |
| Mexico | USA | Overlap | MX200900 | US2GC12 | Pending | Mexico has sent their proposal to the U.S. The U.S. has responded with an amended proposal. | February 2011 |
| UK | USA | Overlap | GB281800 | US2EC01M | Pending | U.S. provided geographic positions to UKHO who is developing a response for resolution. | February 2011 |
| UK | USA | Overlap | GB283000 | US2EC02M | Pending | GB283000 will be cancelled and UK will rebrand as Usage Band 3. | December 2010 |
| UK | France | Overlap | GB283800 | FR250020 | Resolved | GB283800 has been cancelled. FR250020 has been replaced by FR274750. | May 2010 |
| USA | UK | Overlap | US2EC01M | GB283000 | Pending | GB283000 will be cancelled. UK will rebrand as Usage Band 3. | December 2010 |

| Affected Member States | | Data Discrepancy/ Usage Band/ Datum Issues | Affected Cells | | Status | Status Statement | Completion Date |
|------------------------|--------|--|----------------|----------|----------|--|-----------------|
| UK | USA | Overlap | GB302006 | US3PR10M | Pending | GB302006 will be cancelled. UK will rebrand GB302006 as usage band 4. | December 2010 |
| UK | France | Overlap | GB380230 | FR352010 | Resolved | Overlap is <5m on the ground and so is within tolerance. No further action is required. | June 2010 |
| USA | UK | Overlap | US3PR10M | GB300472 | Pending | U.S. provided UKHO with geographic positions. | December 2010 |
| Colombia | UK | Overlap | CO200008 | GB200486 | Resolved | Colombia will produce CO200008, UK will cut GB200486 at the Northern border of CO200008. CO200008 is being reviewed by IC-ENC. | Spring 2011 |
| Colombia | UK | Overlap | CO200008 | GB200396 | Resolved | Colombia will produce CO200008 which will replace GB200396. CO200008 is being reviewed by IC-ENC. | Spring 2011 |

ANNEX C - WORKPLAN MILESTONES

| Delivery Date (2010) | Actions |
|----------------------|---|
| January 31 | Develop base polygons representing adequate ENC coverage derived from medium scale INT scheme |
| January 31 | Acquire MCOVR for MACHC Member States (MS) from the RENC. |
| January 31 | MS points of contact (POC) provide MCOVR data when not available from the RENC. |
| February 24 | Hold quarterly conference call, tentative time 10AM EST, to discuss current coverage, gaps, next steps. |
| March 12 | Forward omitted MCOVR information so that the graphic properly reflects existing and planned ENC coverage. |
| April 9 | Complete the follow-up data analysis to include the new information. |
| April 16 | Countries receive data analysis results, including targeted guidance on areas of primary focus and action. |
| May 21 | Produce draft of final report. (Start now and supplement with new data analysis as appropriate.) |
| May 26 | Hold quarterly conference call to review WG2 MACHC ENC coverage report outline, tentative time 10 AM EST. |
| May 28 | All countries look at data analysis (provided by UK) and forward any omissions and/or updates to Paul Bradley. |
| June 1 | U.S. populates template, based on UK data analysis, and distributes to countries for consideration. |
| June 9 | Countries respond to data analysis via "reporting template." |
| June 16 | Face-to-face meeting for MS POCs to review, discuss and finalize draft WG2 report on the status of adequate ENC coverage. Address any outstanding issues. |
| July 2 | Draft sections of report sent to Chair. |
| August 25 | Expanded draft report sent to WG members for comment. |

| | |
|---------------|---|
| September 8 | Comments on report, and specific comments on the annexes, back to technical coordinator and communications coordinator. |
| September 14 | Hold quarterly follow-up conference call to review and discuss MS response to the WG2 Report. |
| September 20 | Distribute WG2 Report to MACHC Chair; copy to MACHC National Hydrographers for review and endorsement. |
| October 8 | Comments back to ECC Chair; copy to MACHC Chair. |
| October 18 | Submit final report to MACHC. |
| November 8-12 | Seek approval of final report at MACHC meeting in Suriname. |
| December 15 | MACHC Chair to distribute final <i>ENC Coverage for the MACHC Region</i> to the IHB. |

ANNEX D - GUIDELINES FOR ANALYZING M_COVR IN THE MACHC REGION

1. Assess deficiencies in ENC Coverage for Navigation Purpose 1, 2, and 3 Electronic Navigational Charts (ENC).
 - a. Collect polygon/polygons representing areas lacking Navigation Purpose 1 coverage as defined by the small scale INT Scheme.
 - b. Note any other ENC coverage by other navigation purposes of any Navigation Purpose 1 deficient areas.
 - c. Collect polygon/polygons representing areas lacking Navigation Purpose 2 coverage as defined by the medium scale INT Scheme.
 - d. Note any other ENC coverage by other navigation purposes of any Navigation Purpose 2 deficient areas.
 - e. Collect polygon/polygons representing areas lacking Navigation Purpose 3 coverage as defined by the medium scale INT Scheme.
 - f. Note any other ENC coverage by other navigation purposes of any Navigation Purpose 3 deficient areas.
2. Assess deficiencies in coverage within National ENC suites.
 - a. Identify small gaps or slivers existing between same navigation purpose ENC cells within the same national suite.
 - b. Identify small gaps or slivers existing between same navigation purpose ENC cells that junction with ENCs of other national suites.
3. Identify 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. Prepare a report of all identified data deficiencies for the MACHC region.
 - a. Report all data gaps
 - b. Report all data overlaps
 - c. Report all data anomalies
 - d. Propose recommendations to fix data deficiencies

ANNEX E - LIST OF WG 2 PARTICIPANTS

MACHC ELECTRONIC CHART COMMITTEE

| Country | Contact | Email |
|------------------------|--|--|
| Chair | Katie Ries | kathryn.ries@noaa.gov |
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TECHNICAL AND COMMUNICATIONS SUPPORT

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|-------------------------------|--------------|--|
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