

**- Biograd Boat Show -
19. listopada 2017.**

ELEKTRONIČKE NAVIGACIJSKE KARTE U SVJETLU NOVIH PROPISA I ISKUŠTAVA KORISNIKA

**Mr.sc. Željko Bradarić, kap.
Hrvatski hidrografski institut - Split**



Uvod



Posljednjih desetak godina uočava se stalno povećanje upotrebe elektroničkih kartografskih sustava i dodatnih kartografskih podataka u pomorskoj navigaciji.

Nažalost ovo povećanje upotrebe prati i povećanje konfuzije u vezi termina «elektronskih karata» i onog što se smije i može koristiti sukladno zahtjevima važećih propisa.

Svrha ovog predavanja je pojasniti pojmovno i tehnički elektroničke karte, te njihovo korištenje u odnosu na SOLAS zahtjeve, kao i moguće non-SOLAS opcije u svijetu i Hrvatskoj.

Sadržaj



- ❑ Uvod
- ❑ Definicija i elementi sigurnosti plovidbe
- ❑ Navigacijska pomagala
- ❑ Propisi
- ❑ Službena elektronička navigacijska karta (ENC)
- ❑ Hrvatski ENC-ovi
- ❑ Dostupnost karta
- ❑ Mogući nedostaci i načini rješavanja
- ❑ Edukacija
- ❑ Ostali elektronički kartografski sustavi (ESC)
- ❑ Non – SOLAS opcija



SIGURNOST PLOVIDBE

Definicija:

Skup plovidbenih uvjeta normiranih nacionalnim i međunarodnim propisima koji se odnose na sigurnost brodova u plovidbi morem i unutrašnjim plovidbenim putovima.

SIGURNOST PLOVIDBE

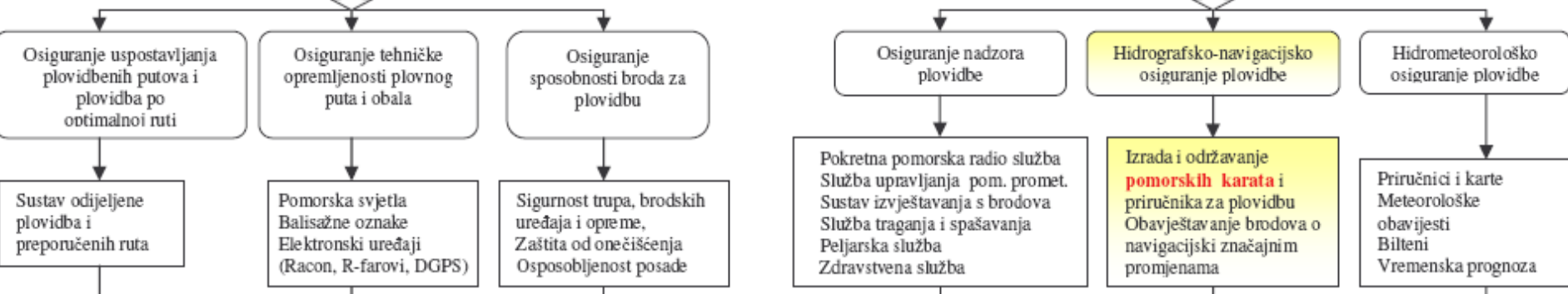
Skup plovidbenih uvjeta normiranih nacionalnim i međunarodnim propisima koji se odnose na sigurnost brodova u plovidbi morem i unutrašnjim plovidbenim putovima



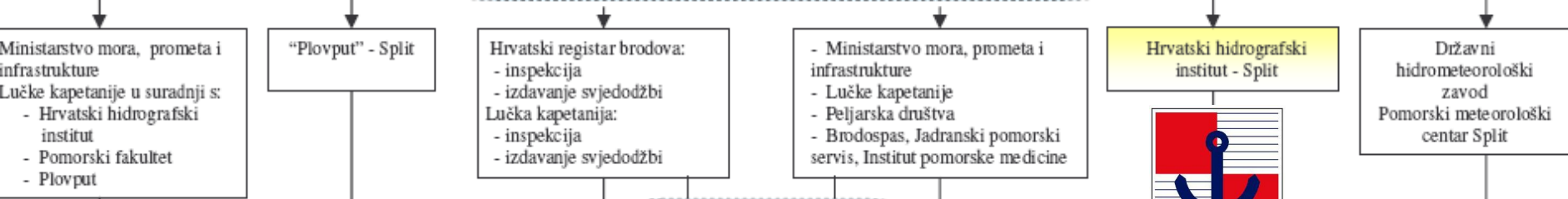
Elementi sigurnosti plovidbe

Tehnički element sigurnosti plovidbe

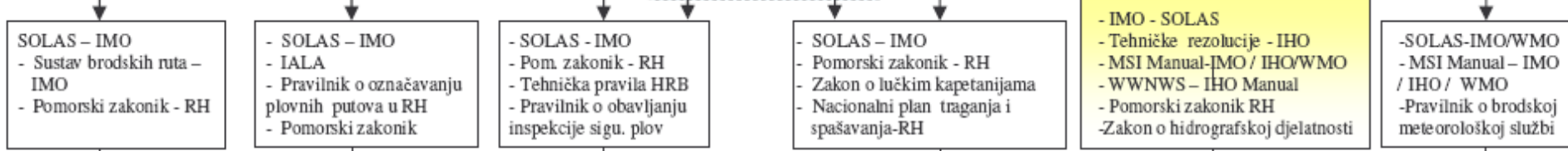
Informativni segment sigurnosti plovidbe



Ustanove i organizacije odgovorne za provedbu glavnih elemenata



Propisi koji reguliraju

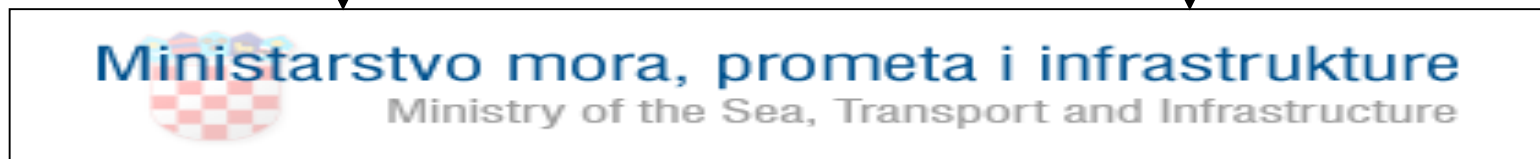


Nadzor nad implementacijom i provedbom propisa – Ministarstvo mora, prometa i

INT



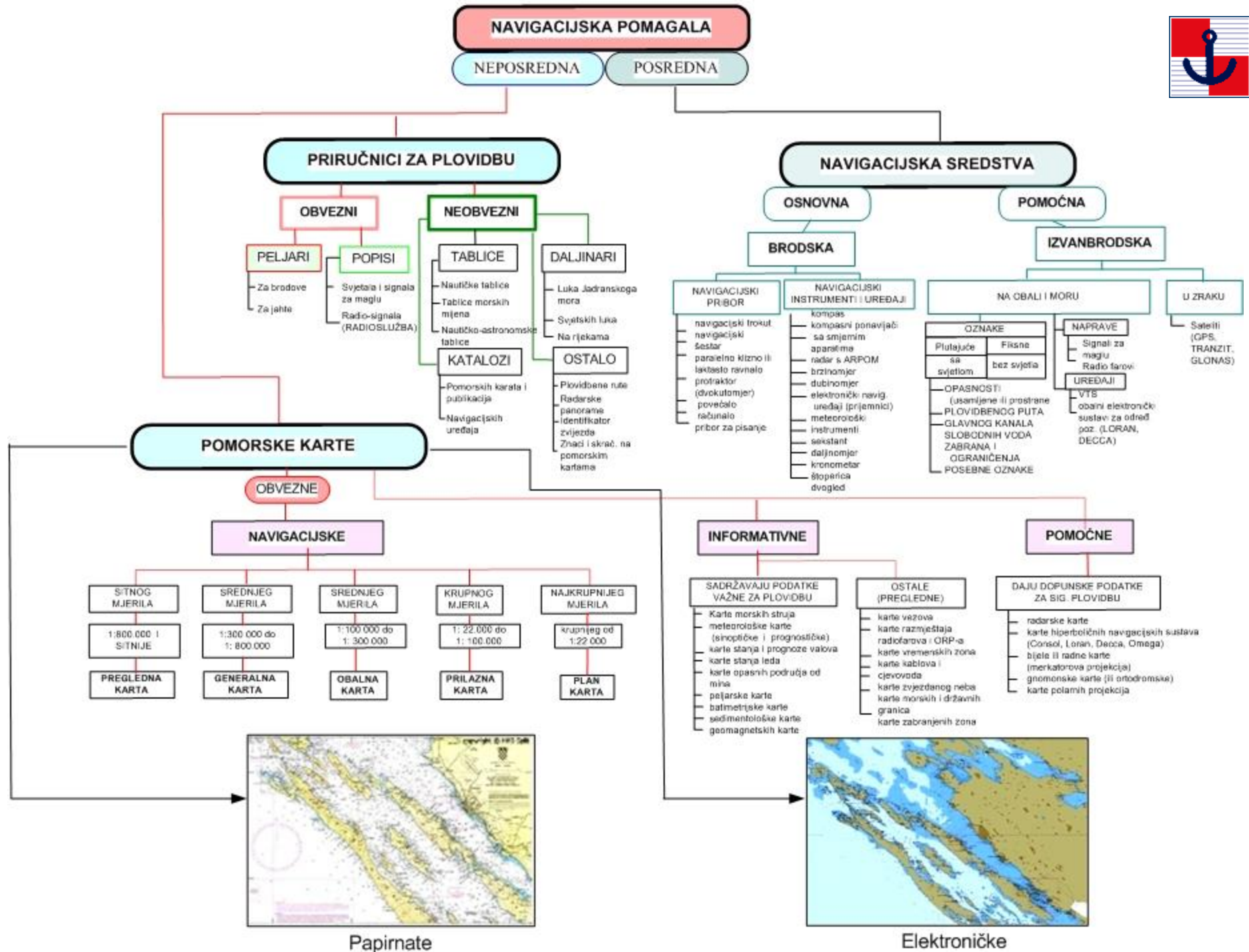
NAC



**PROPISI ZA IMPLEMENTACIJU I
NADZOR**



**SLUŽBENE NEVIGACIJSKE KARTE I
PRIRUČNICI**



SOLAS V zahtjevi za pomorskim kartama



SOLAS - Međunarodna konvencija o zaštiti ljudskih života na moru

- ❑ Pravilo 2 daje definiciju karte i određuje da karte, bilo papirnatu ili elektroničku, **mora izdati ili autorizirati država, ovlaštena hidrografska organizacija** ili neka slična odgovarajuća državna institucija (official charts).
- ❑ Pravilo 19 određuje da brod (neovisno o veličini) **mora imati službene pomorske karte i publikacije za planirano putovanje**. Također određuje ~~moгуćnost~~ **obaveznim** opremanje određenih klasa brodova informacijskim sustavom za prikaz elektroničkih karata (**ECDIS**) podržanih pomoćnim sustavima.
- ❑ Pravilo 27 određuje da karte koje koriste pomorci **moraju biti održavane**, tj. korigirane prema Oglasu za pomorce.

Hrvatski zahtjevi za pomorskim kartama

TEHNIČKA PRAVILA

ZA STATUTARNU CERTIFIKACIJU POMORSKIH OBJEKATA,



▣ Pravila za statutarnu certifikaciju pomorskih brodova,

1.2.1 Nautičke karte ili nautička publikacija je mapa ili knjiga posebne namjene ili posebno sakupljena baza podataka iz kojih proizlaze takva mapa ili knjiga i koje službeno izdaje sama vlada ili u njeno ime, ovlašteni Hidrografski zavod ili druga odgovarajuća vladina institucija, i koje su izvedene tako da udovoljavaju zahtjevima pomorske navigacije.

Dio 16. Pomagala za navigaciju, Odjeljak 2. Toč. 2.2 Zahtjevi za navigacijskim sustavima i op., Tab. 2.2.1.,

(papirnat karti i mogućnost obveznu upotrebu ECDIS-a, obvezan ECDIS za High Speed Crafts od 01.07.2008 / 2010. i ostale brodove u razdoblju 01.07.2012.-2018).

Pravila za statutarnu certifikaciju brodica i jahti

- za jahte (Odsjek 5. Točka 5.3.3.2 Zahtjevi za navigacijskim pomagalima, Tab. 5.3.3-2
- za brodice (Odsjek 6. Točka 6.3.2 Zahtjevi za opremanje brodica, tab. 6.3.2-1 i 2.

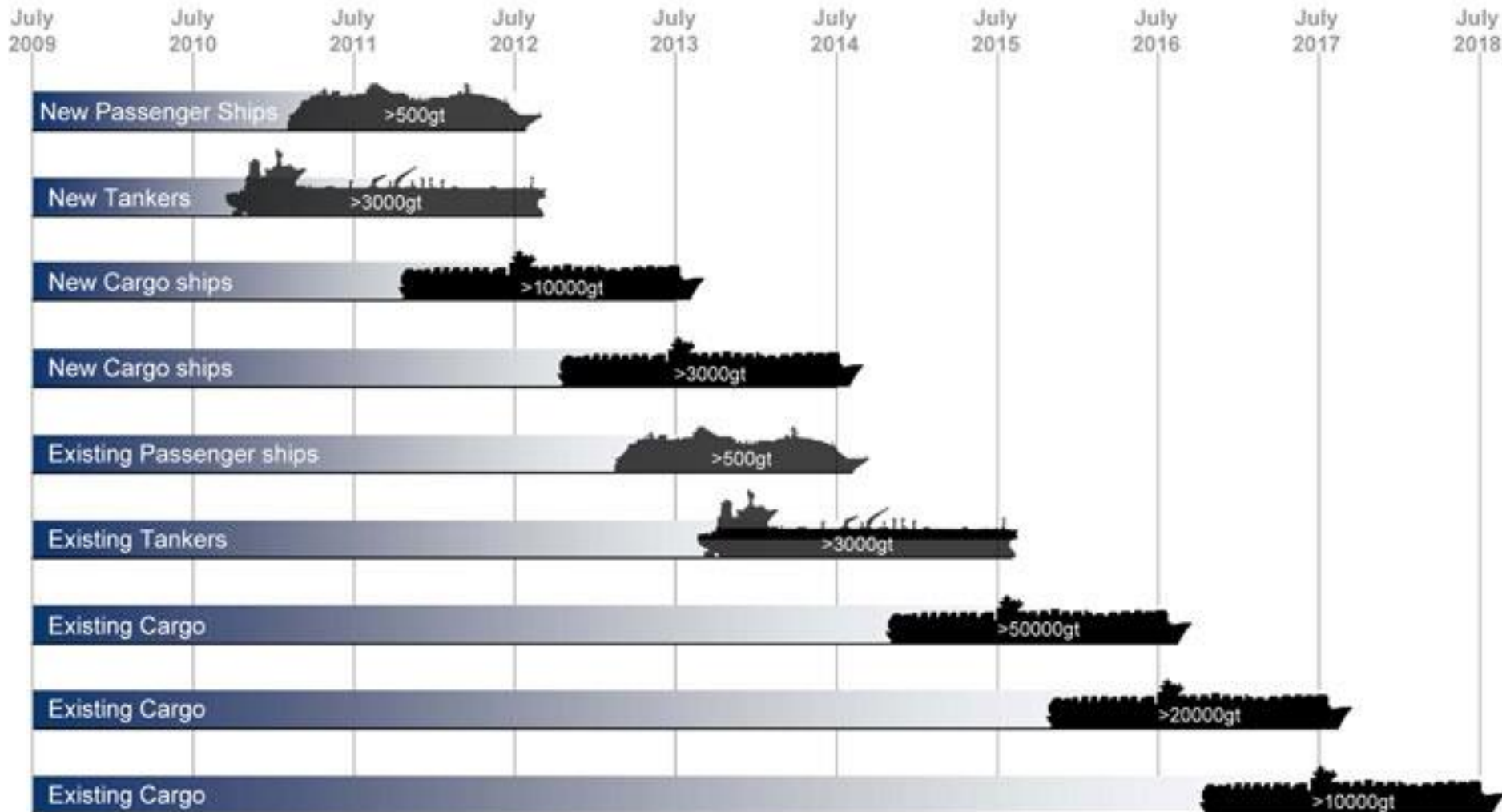
(samo navigacijske karte i nautičke publikacije prema području plovidbe)



IMO novosti - obavezan ECDIS

- IMO odobrio izmjene SOLAS konvencije prema rezoluciji MSC (VI/2009), na snazi od 01.01.2011. – obavezno opremanje brodova ECDIS-om od 01.07.2012. do 01.07.2018. ovisno o vrsti i veličini broda
- IMO već ranije prihvatio izmjene SOLAS konvencije - ECDIS obavezan za High Speed Crafts(HSC) 01.07.2008. (2010.)

Implementacija ECDIS-a





SOLAS V zahtjevi za jahte

▣ SOLAS V za jahte

- ❖ Veći dio SOLAS konvencije odnosi se samo na velike trgovačke brodove, ali dijelovi Poglavlju V. od 1. srpnja 2002. primjenjuju se na mala, u privatnom vlasništvu, plovila za rekreaciju.
- ❖ Zahtjev za planiranjem plovidbe primjenjuju na sva plovila, bez obzira na veličinu.
- ❖ Ako je plovilo uključeno u pomorsku nesreću i ako se provedenom istragom dokaže da nisu primijeni osnovni principi navedeni u pravilu 34, moguće je kazneno gonjenje.

▣ Planiranje plovidbe

- ❖ Pravilo V/34 "Sigurna plovidba i izbjegavanje opasnih situacija", je novo pravilo. Odnosi se na obvezu prethodnog planiranje plovidbe. Uobičajeno poznat kao Voyage Plan
- ❖ Za mala plovila i jahte stupanj planiranje će ovisiti o veličini plovila, broju posade i trajanju plovidbe

Koje su karte dostupne?



■ Papirne karte

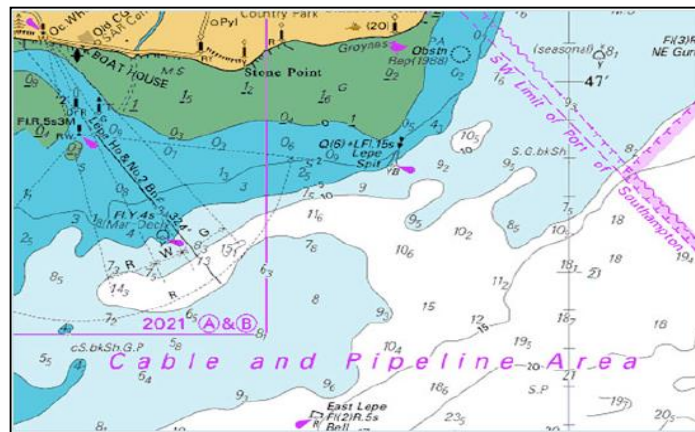


■ Digitalne karte

■ Raster



- skenirani pasivni prikaz papirne karte

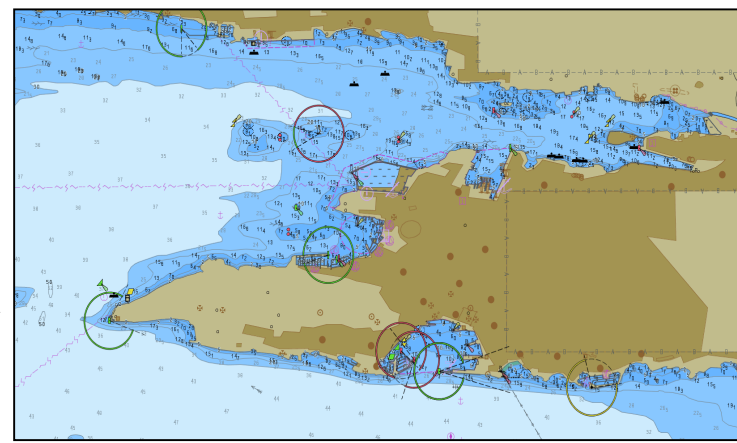
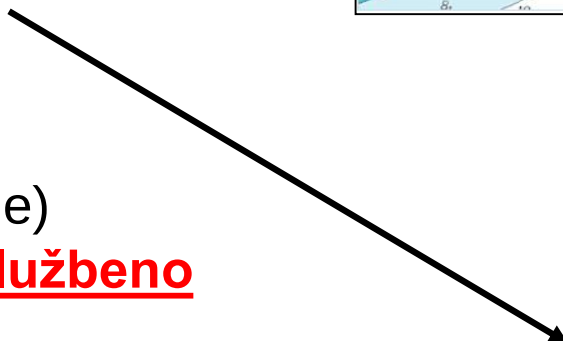


■ Vektor

- digitalna baza svih objekata karte

■ Službene (vladine)

■ Privatne (nisu službeno prihvaćene za navigaciju)

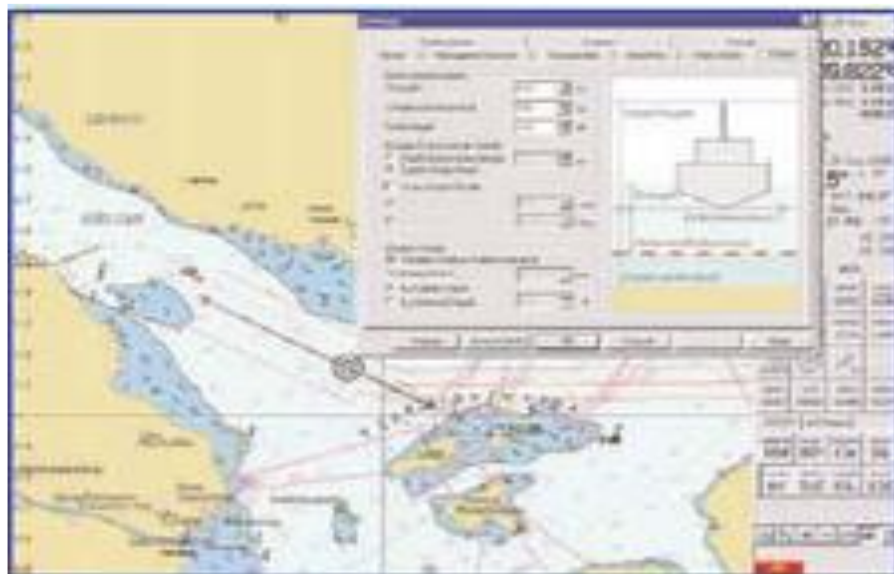
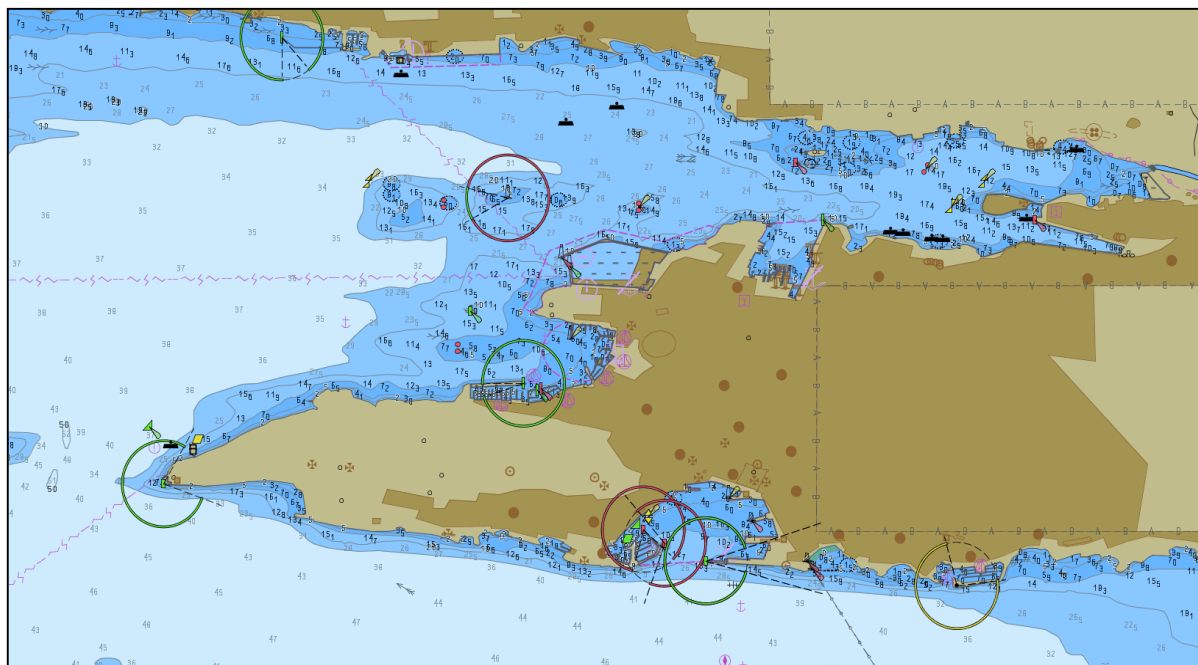


Što je službeni ENC

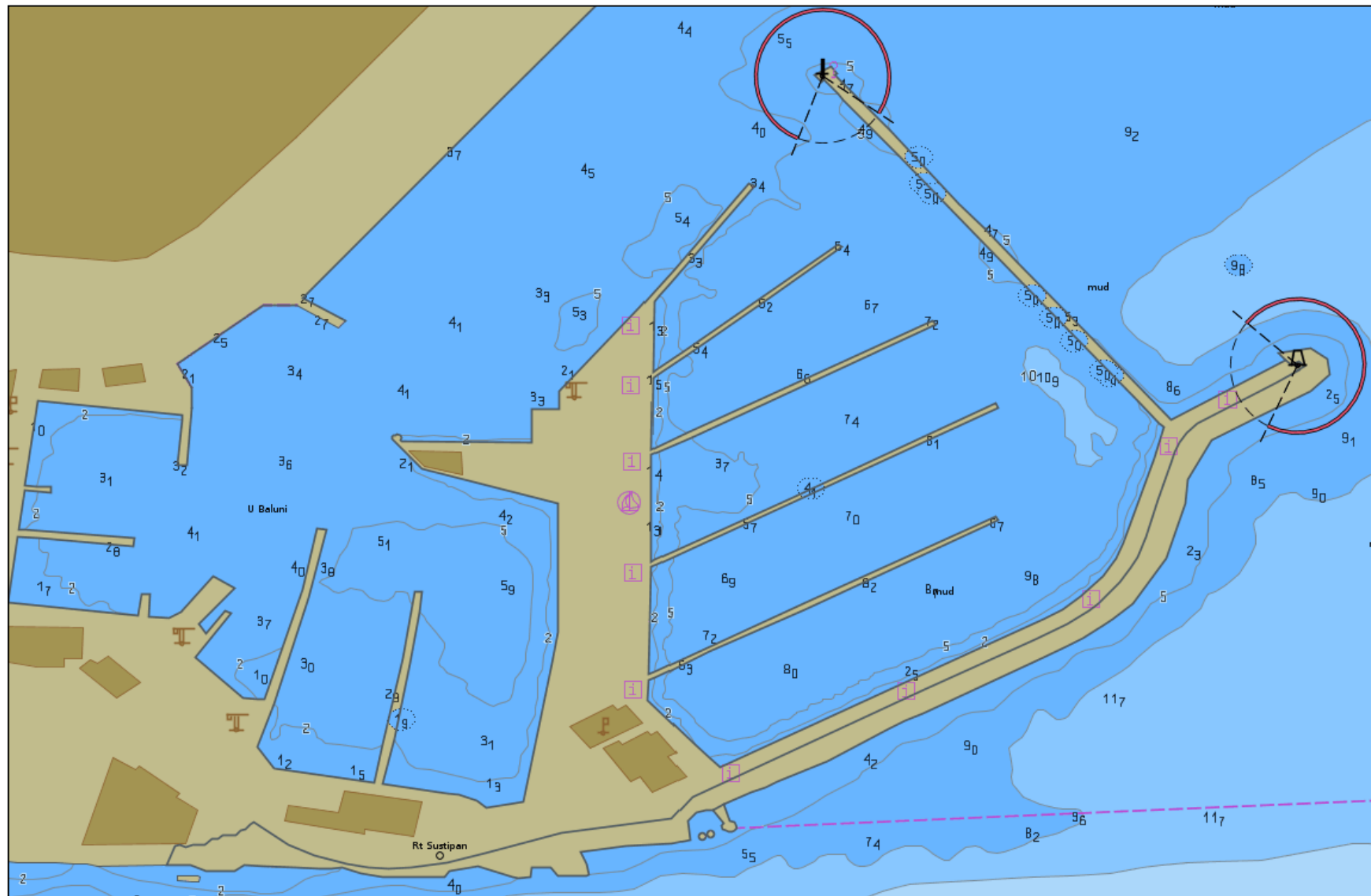


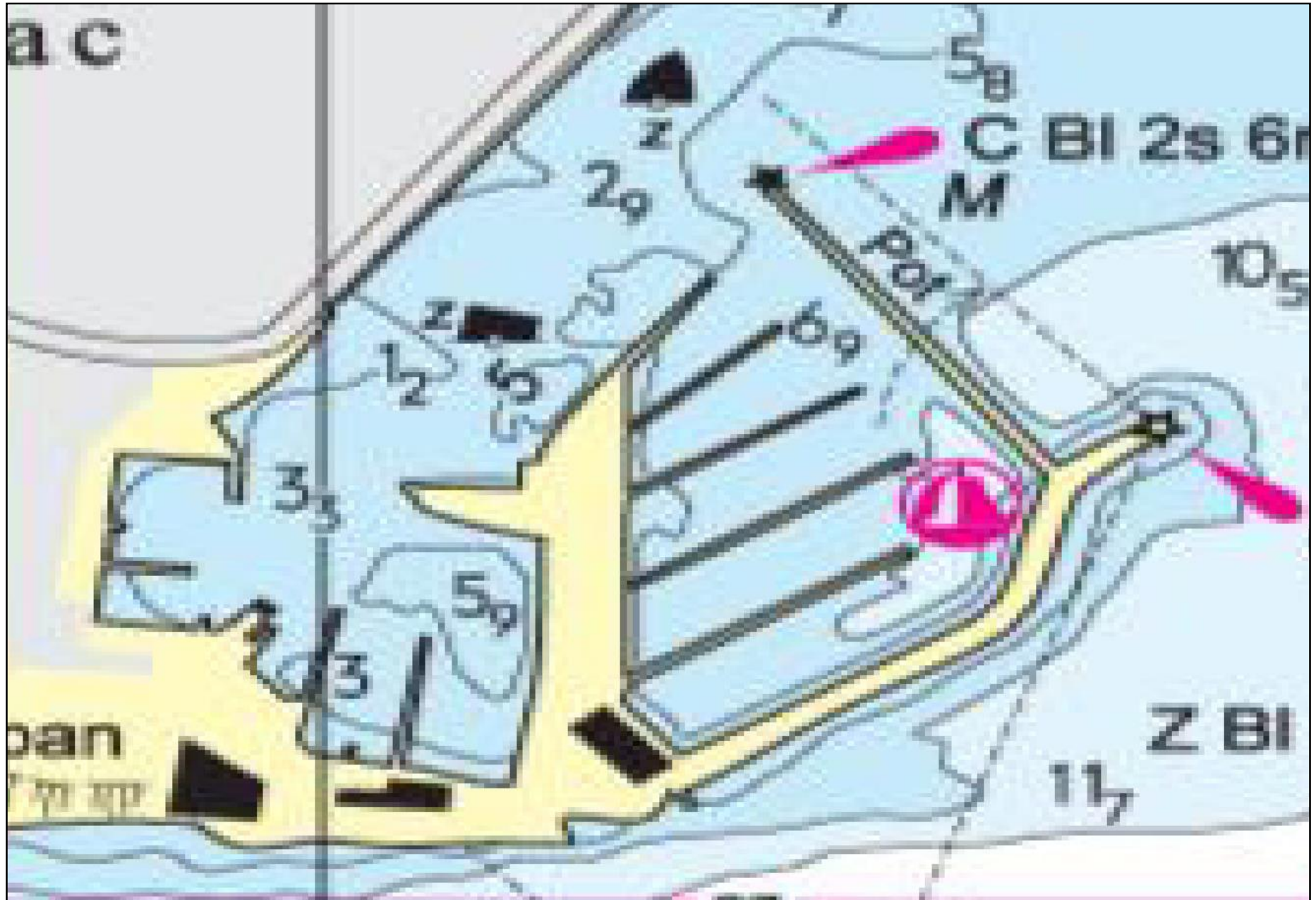
❑ Electronic Navigational Chart (ENC)

- Digitalna baza podataka
- Vektorski format
- Pozicije u WGS 84
- Međunarodni standard (IHO S-57, S-52, S-63 SENC,...)
- Odgovornost hidrografskog ureda
- Redovito održavanje (Notices for mariners)

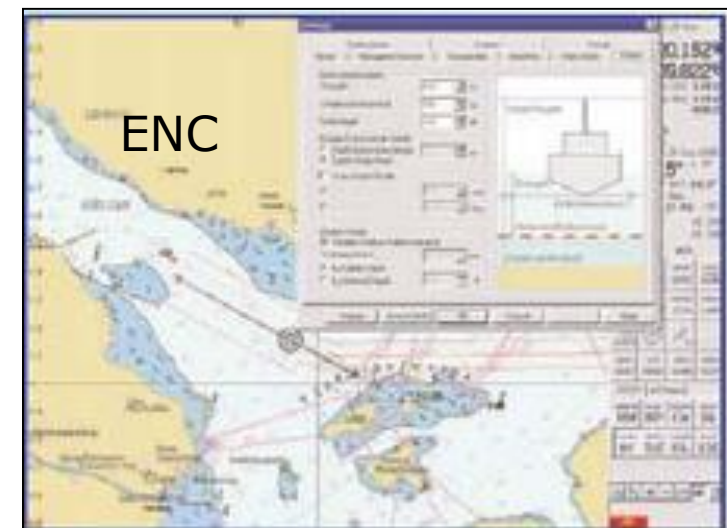
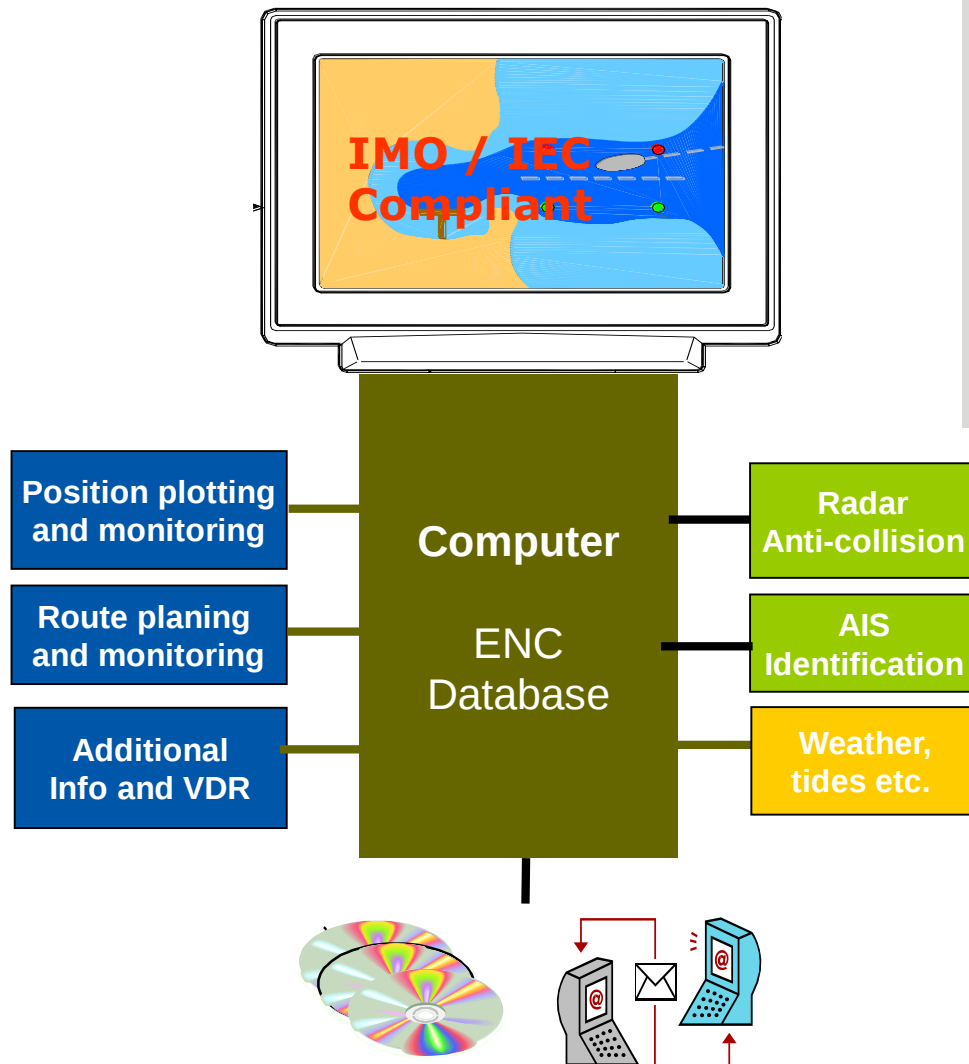


ACI marina Split, vektor (ENC) mjerilo 1 :2000





Electronic Chart Display and Information System ECDIS



SOLAS ECDIS / ENC zahtjevi



Tri su ključne komponente:

- ❑ **Postojanje ECDIS sustava** sukladno IMO ECDIS izvedbenom standardu odobrenog tipa.
- ❑ **Postojanje zamjenskog sustava** za ECDIS (drugi ECDIS uređaj ili odgovarajući komplet papirnatih karata).
- ❑ **Postojanje službenih ENC-a** koje će se koristiti u ECDIS sustavu. (ENC izrađene sukladno standardu IHO-a).

Ovisnost ECDIS i ENC-a

Jedino ako i ECDIS i ENC udovoljavaju svim IMO i IHO normama, uz uvjet pravilnog korištenja, predstavljat će **pouzdana** navigacijsko pomagalo.



U. S. Department of Homeland Security
United States Coast Guard
Certificate of Approval

Coast Guard Approval Number: 165.123/7/1

Expires: 08 March 2017

ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM

FURUNO USA
4400 NW Pacific Rim Blvd
Camas, WA 98607

Furuno, EC-1000 Electronic Chart Display and Information System (ECDIS).

Furuno, EC-1000 ECDIS meets the requirements set forth in:

IMO Resolution A.694(17), MSC.232(82), and MSC.191(79),
IEC 61174 (edition 3, 2008),
IEC 62288 (edition 1, 2008),
IEC 60945 (edition 4, 2002) incl. Corr. 1 (2008),
IEC 61162-1 (edition 4, 2010), and
IEC 61162-2 (edition 1, 1998).

The Furuno EC-1000 ECDIS consists of the components:

Main Processing Unit: EC 1000 C with software version 6.0;
Display Units: (see Annex 1 of this certificate);
Control Head: RCU-018;
TB Control Unit: RCU-015;
Remote Control Unit: RCU-016;
Sensor Interface Connection Box LAN-Adapter: EC-1010;
Sensor Interface connection Box B-Adapter: EC-1020; and
HUB: HUB-100.

BSH Test Reports Number BSH/4612/4301035/9 and 46162/0071829/2011.

*** END ***

THIS IS TO CERTIFY THAT the above named manufacturer has submitted to the undersigned satisfactory evidence that the item specified herein complies with the applicable laws and regulations as outlined on the reverse side of this Certificate, and approval is hereby given. This approval shall be in effect until the expiration date hereon unless sooner canceled or suspended by proper authority.

GIVEN UNDER MY HAND THIS 7th DAY OF
SEPTEMBER 2011, AT WASHINGTON D.C.

C. K. MARCY
COMMANDER, U.S. COAST GUARD
CHIEF, SYSTEMS ENGINEERING DIVISION
BY DIRECTION OF THE COMMANDANT



S-52 Display Standard



While S-57 defines **what** information can be encoded and how it is to be structured,

How that data can be displayed in an ECDIS is defined within S-52

S-52 specify also the full range of **conditional rules** that govern their use.



DET NORSKE VERITAS TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. A-7752
This Certificate consists of 4 pages

This is to certify that the
Electronic Chart Display and Information System (ECDIS)

with type designation
VISION 2100 ECDIS

Manufactured by
LITTON MARINE SYSTEMS INC.
1070 Seminole Trail
Charlottesville, VA 22901, U.S.A.

is found to comply with

- Performance standards for electronic chart display and information systems. (IMO Res. A.817(19))
- General requirements for shipborne radio equipment, (GMDSS) and for electronic navigational aids. (IMO Res. A.694(17))
- General requirements for electromagnetic compatibility for all electrical and electronic ship's equipment. (IMO Res. A.813(19))
- Code on Alarms and Indicators (IMO Res. A.686(17) and A.830(19)) as applicable
- IEC 61174 Ed. 1.0 (1998-08) Maritime navigation and radiocommunication equipment and systems - Electronic chart display and information system (ECDIS) - Operational and performance requirements, methods of testing and required test results
- IEC 60945 Ed. 3.0 (1996-11) Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results
- IEC 61162-1 Ed. 1.0 (1995-11) Maritime navigation and radiocommunication equipment and systems - Digital interfaces - Part 1: Single talker and multiple listeners

Place and date
Høvik, 2000-09-15
for DET NORSKE VERITAS AS

Per Martinsen
Head of Section



Local Office
DNV New Jersey

This Certificate is valid until
2002-12-31

Finn H. Spøene
Finn H. Spøene
Surveyor

Notice: This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



HRVATSKI REGISTAR BRODOVA

Croatian Register of Shipping



EC TYPE EXAMINATION (MODULE B) CERTIFICATE

No. 03-001579/031279

THIS IS TO CERTIFY:

That Croatian Register of Shipping did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with requirements of Marine Equipment Directive (MED) 2014/90/EU, subject to any conditions in the schedule attached hereto.

TYPE AND DESCRIPTION OF PRODUCT

Electronic chart display and information system - ECDIS
with type designation **Maris ECDIS900 MK15**

NUMBER AND ITEM DESIGNATION (in accordance with Annex of Regulation (EU) 2017/306)

MED/4.30 - Electronic chart display and information system (ECDIS) with backup, and raster chart display system (RCDS)

MANUFACTURER:

NAVICO HOLDING AS, Nyåskaiveien 2,
4374 Egersund - Norway

REGULATIONS AND STANDARDS (in accordance with Annex of Regulation (EU) 2017/306)

SOLAS 1974 as amended, Reg. V/19

IMO Res. A.694(17), IMO Res. MSC.191(79), IMO Res. MSC.232(82), IMO Res. MSC.302(87) and IMO SN.1/Circ.266.

NOTICE:

1. Further details of the product and conditions for certification are given overleaf.
2. This certificate will not be valid if the manufacturer makes any changes or modifications to the approved equipment, which have not been notified to, and agreed with the notified body named on this certificate.
3. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply.
4. The Mark of Conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-control phase module (D, E, or F) of Annex II of the Directive is fully complied with and controlled by a written inspection agreement with a notified body.
5. In case limitations of use apply, these should be indicated of in the Schedule of Approval.

Issued by Croatian Register of Shipping, notified body number 2489.

This certificate is valid until: 2021-04-09

Place and date: Split, 2017-04-10

Seal

Signature
Marinko Popović, dipl.ing.

Da li vaš ECDIS udovoljava IMO zahtjevima za kartama



Are ENC available for area of operation?	YES	NO	YES	NO
What Digital Charts are being used in the ECDIS by the mariner?	ENC (coverage at an appropriate scale for navigation)	RNC (coverage at an appropriate scale for navigation)	RNC	Private charts (6)
What back up system is required?	Independent ECDIS or other back up solution required	Independent ECDIS or other back up solution required	None required (3)	None required (3)
What are the requirements for the carriage of Official paper charts?	None needed (1) (except if back up is a folio of paper charts)	An “appropriate” folio of up to date paper charts to be used in conjunction with the ECDIS in RCDS mode	All up to date paper charts required for safe navigation in areas where ENC’s are available	All up to date paper charts required for safe navigation for the intended voyage
How is the ECDIS operating ?	As an ECDIS	As an ECDIS in RCDS mode	As an ECDIS in RCDS mode	As an ECS
Does the ECDIS fulfil Chart Carriage Requirements?	YES (1)	YES (2)	NO (4)	NO(5)

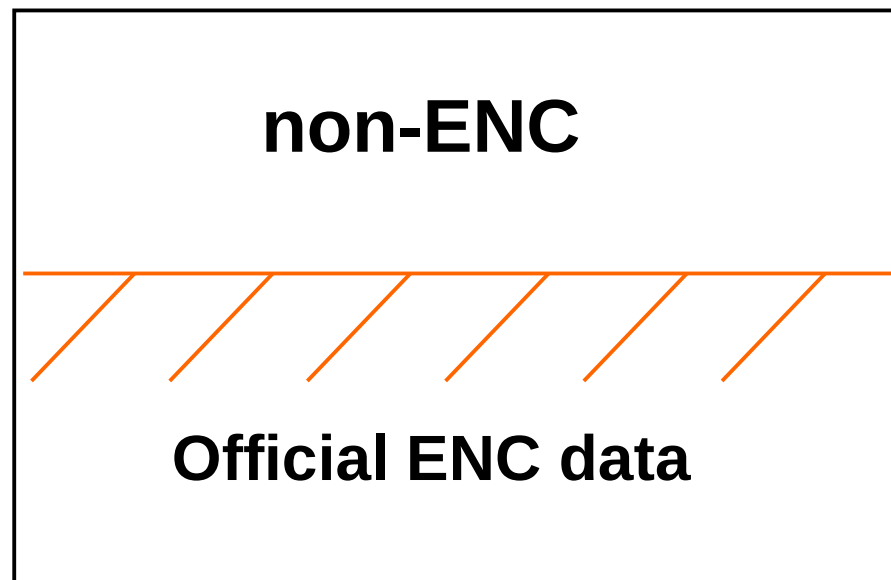
Notes:

- 1) Some Flag States may require specific documentation to allow this.
- 2) Requires approval of vessel’s Flag State – Flag State defines meaning of ‘appropriate’
- 3) Back up system is only required if ECDIS is intended to meet carriage requirements
- 4) For ECDIS to fulfil Carriage requirements vessels must use ENC’s where these are available
- 5) Paper charts (not the ECDIS) must remain the primary means of navigation
- 6) If private charts are used in an ECDIS the system is regarded as operating as an ECS. ECDIS operating as ECS, ECS systems meeting RTCM or IEC standards or Private charts meeting ISO standards being used in ECDIS do not meet IMO chart carriage requirements.



Kako prepoznati službeni ENC?

- I. *Kod kupovine*: Distributer ovlašten od HO ili od RENC
- II. *Kod upotrebe u ECDIS-u*: Sustav generira upozorenje kad se pojave neslužbeni podaci



SOLAS zahtjev za obavljanje hidrografske djelatnosti



- Pravilo 9 određuje da države potpisnice SOLAS Konvencije moraju osigurati:
 - obavljanje hidrografske izmjere,
 - publiciranje podataka na kartama i u priručnicima,
 - te izdavanje Oglasa za pomorce kako bi se karte održavale i pravilno korigirale

- Zakon o hidrografskoj djelatnosti (implementacija Pravila 9)

SIGURNOST PLOVIDBE

Skup plovidbenih uvjeta normiranih nacionalnim i međunarodnim propisima koji se odnose na sigurnost brodova u plovidbi morem i unutrašnjim plovidbenim putovima



Elementi sigurnosti plovidbe

Tehnički element sigurnosti plovidbe

Informativni segment sigurnosti plovidbe

Osiguranje uspostavljanja plovidbenih putova i plovidba po optimalnoj ruti

Osiguranje tehničke opremljenosti plovnog puta i obala

Osiguranje sposobnosti broda za plovidbu

Osiguranje nadzora plovidbe

Hidrografsko-navigacijsko osiguranje plovidbe

Hidrometeorološko osiguranje plovidbe

Sustav odijeljene plovidbe i preporučenih ruta

Pomorska svjetla
Balisažne oznake
Elektronski uređaji
(Racon, R-farovi, DGPS)

Sigurnost trupa, brodskih uređaja i opreme,
Zaštita od onečišćenja
Osposobljenost posade

Pokretna pomorska radio služba
Služba upravljanja pom. promet.
Sustav izvještavanja s brodova
Služba traganja i spašavanja
Peljarska služba
Zdravstvena služba

Izrada i održavanje
pomorskih karata i
priručnika za plovidbu
Obavješćavanje brodova o
navigacijski značajnim
promjenama

Priručnici i karte
Meteorološke
obavijesti
Bilteni
Vremenska prognoza

Ustanove i organizacije odgovorne za provedbu glavnih elemenata

Ministarstvo mora, prometa i
infrastrukture
Lučke kapetanije u suradnji s:
- Hrvatski hidrografski
institut
- Pomorski fakultet
- Plovput

"Plovput" - Split

Hrvatski registar brodova:
- inspekcija
- izdavanje svjedodžbi
Lučka kapetanija:
- inspekcija
- izdavanje svjedodžbi

- Ministarstvo mora, prometa i
infrastrukture
- Lučke kapetanije
- Peljarska društva
- Brodospas, Jadranski pomorski
servis, Institut pomorske medicine

Hrvatski hidrografski
institut - Split

Državni
hidrometeorološki
zavod
Pomorski meteorološki
centar Split

Propisi koji reguliraju

SOLAS – IMO
- Sustav brodskih ruta –
IMO
- Pomorski zakonik - RH

- SOLAS – IMO
- IALA
- Pravilnik o označavanju
plovnih putova u RH
- Pomorski zakonik

- SOLAS - IMO
- Pom. zakonik - RH
- Tehnička pravila HRB
- Pravilnik o obavljanju
inspekcije sigu. plov

- SOLAS – IMO
- Pomorski zakonik - RH
- Zakon o lučkim kapetanijama
- Nacionalni plan traganja i
spašavanja-RH

- IMO - SOLAS
- Tehničke rezolucije - IHO
- MSI Manual-IMO / IHO/WMO
- WWNWS – IHO Manual
- Pomorski zakonik RH
- Zakon o hidrografskoj djelatnosti

-SOLAS-IMO/WMO
- MSI Manual – IMO
- IHO / WMO
-Pravilnik o brodskoj
meteorološkoj službi

Nadzor nad implementacijom i provedbom propisa – Ministarstvo mora, prometa i

Poslovni procesi hidrografske službe



Elektroničke navigacijske karte (ENC)

ECDIS





ENC PORTFOLIO

ENC CELL No / NAME - Broj / IME Scale / Mjerilo

OVERVIEW CHARTS - PREGLEDNE KARTE

HR100101 101 (Jadransko more) 800 000

GENERAL CHARTS - GENERALNE KARTE

HR200031 300-31 (Venezija - Zadar) 300 000

HR200032 300-32 (Ancona - Šibenik) 300 000

HR200033 300-33 (Pescara - Split) 300 000

HR200034 300-34 (Barietta - Dubrovnik) 300 000

COASTAL CHARTS - OBALENE KARTE

HR300015 100-15 (Grado - Rovinj) 100 000

HR300016 100-16 (Pula - Kvarner) 100 000

HR300017 100-17 (Lošinj - Molat) 100 000

HR300018 100-18 (Rijeka - Kvarnerić) 100 000

HR300019 100-19 (Šibica - Pag) 100 000

HR300020 100-20 (Dugi otok - Zadar) 100 000

HR300021 100-21 (Šibenik - Split) 100 000

HR300022 100-22 (Jabuka - Vis) 100 000

HR300023 100-23 (Trenje - Palagruža) 100 000

HR300024 100-24 (Palagruža - Lastovo) 100 000

HR300025 100-25 (Hvar - Lastovo) 100 000

HR300026 100-26 (Brač - Hvar) 100 000

HR300027 100-27 (Palačac - Mljet) 100 000

HR300028 100-28 (Dubrovnik - Bučva) 100 000

HR300029 100-29 (Dubrovnik - Dubrovnik) 100 000

HR300030 100-30 (Dubrovnik - Dubrovnik) 100 000

HR300031 100-31 (Dubrovnik - Dubrovnik) 100 000

HR300032 100-32 (Dubrovnik - Dubrovnik) 100 000

HR300033 100-33 (Dubrovnik - Dubrovnik) 100 000

HR300034 100-34 (Dubrovnik - Dubrovnik) 100 000

HR300035 100-35 (Dubrovnik - Dubrovnik) 100 000

HR300036 100-36 (Dubrovnik - Dubrovnik) 100 000

HR300037 100-37 (Dubrovnik - Dubrovnik) 100 000

HR300038 100-38 (Dubrovnik - Dubrovnik) 100 000

HR300039 100-39 (Dubrovnik - Dubrovnik) 100 000

HR300040 100-40 (Dubrovnik - Dubrovnik) 100 000

HR300041 100-41 (Dubrovnik - Dubrovnik) 100 000

HR300042 100-42 (Dubrovnik - Dubrovnik) 100 000

HR300043 100-43 (Dubrovnik - Dubrovnik) 100 000

HR300044 100-44 (Dubrovnik - Dubrovnik) 100 000

HR300045 100-45 (Dubrovnik - Dubrovnik) 100 000

HR300046 100-46 (Dubrovnik - Dubrovnik) 100 000

HR300047 100-47 (Dubrovnik - Dubrovnik) 100 000

HR300048 100-48 (Dubrovnik - Dubrovnik) 100 000

HR300049 100-49 (Dubrovnik - Dubrovnik) 100 000

HR300050 100-50 (Dubrovnik - Dubrovnik) 100 000

HR300051 100-51 (Dubrovnik - Dubrovnik) 100 000

HR300052 100-52 (Dubrovnik - Dubrovnik) 100 000

HR300053 100-53 (Dubrovnik - Dubrovnik) 100 000

HR300054 100-54 (Dubrovnik - Dubrovnik) 100 000

HR300055 100-55 (Dubrovnik - Dubrovnik) 100 000

HR300056 100-56 (Dubrovnik - Dubrovnik) 100 000

HR300057 100-57 (Dubrovnik - Dubrovnik) 100 000

HR300058 100-58 (Dubrovnik - Dubrovnik) 100 000

HR300059 100-59 (Dubrovnik - Dubrovnik) 100 000

HR300060 100-60 (Dubrovnik - Dubrovnik) 100 000

HR300061 100-61 (Dubrovnik - Dubrovnik) 100 000

HR300062 100-62 (Dubrovnik - Dubrovnik) 100 000

HR300063 100-63 (Dubrovnik - Dubrovnik) 100 000

HR300064 100-64 (Dubrovnik - Dubrovnik) 100 000

HR300065 100-65 (Dubrovnik - Dubrovnik) 100 000

HR300066 100-66 (Dubrovnik - Dubrovnik) 100 000

HR300067 100-67 (Dubrovnik - Dubrovnik) 100 000

HR300068 100-68 (Dubrovnik - Dubrovnik) 100 000

HR300069 100-69 (Dubrovnik - Dubrovnik) 100 000

HR300070 100-70 (Dubrovnik - Dubrovnik) 100 000

HR300071 100-71 (Dubrovnik - Dubrovnik) 100 000

HR300072 100-72 (Dubrovnik - Dubrovnik) 100 000

HR300073 100-73 (Dubrovnik - Dubrovnik) 100 000

HR300074 100-74 (Dubrovnik - Dubrovnik) 100 000

HR300075 100-75 (Dubrovnik - Dubrovnik) 100 000

HR300076 100-76 (Dubrovnik - Dubrovnik) 100 000

HR300077 100-77 (Dubrovnik - Dubrovnik) 100 000

HR300078 100-78 (Dubrovnik - Dubrovnik) 100 000

HR300079 100-79 (Dubrovnik - Dubrovnik) 100 000

HR300080 100-80 (Dubrovnik - Dubrovnik) 100 000

ENC CELL No / NAME - Broj / IME Scale / Mjerilo

APPROACH CHARTS - PRILAZNE KARTE

HR400003 50-3 (Pula - Cres) 55 000

HR400004 50-4 (Riječki zaljev) 55 000

HR400020 50-20 (Dubrovnik) 50 000

HR40011A 11 (Vrsar) 25 000

HR40011E 11 (Luka Mima i Novigrad) 25 000

HR40011I 11 (Piranski zaljev) 25 000

HR40020G 20 (Tih kanal) 30 000

HR40022A 22 (Mali i Veliki Lošinj) 25 000

HR40037D 37 (Palanski tjesnac) 30 000

HR40037E 37 (Luka Telašćica) 25 000

HR400512 512 (Komar - Murter) 40 000

HR400032 32 (Sedmovalje-Pr. V. Ždrelac) 35 000

HR400533 533 (Šibenski kanal) 25 000

HR400535 535 (Starogrski zaljev) 28 800

HR400535C 535 (Vrbovica i Jelsa) 28 800

HR400535D 535 (Brna) 28 800

HR400535E 535 (Karbun) 28 800

HR400535F 535 (Zaljev Vela Luka) 28 800

HR400535G 535 (Medulin) 28 800

HR400535H 535 (Sidište Pribiza) 28 800

HR400535I 535 (Velji i Mali Lago) 28 800

LEGEND - TUMAČ ZNAKOVA

PRODUCED / PROIZVEDENO

- RELEASED / REALIZIRANO

- IN PROGRESS / U IZRADI

03/2017
124 cells
/čelija

HHI ENC izazovi

- 100% ENC's pokrivenost kao uvjet (IHO podrška NHO da do konca 2010. osiguraju pokrivenost međunarodnih plovidbenih područja ENC-ovima)
- HO's izazovi – tehnologija, znanje, troškovi
- WEND principi – smjernice za realizaciju nacionalnih ENC's.

U razdoblju (2006-09):

- izrađeno u suradnji s privatnom kompanijom (117 ENC's paper based);
- 90 ENC's svih 6 navigacijskih grupa trenutno u distribucija
- osigurana dostupnost širom svijeta (Primar; IC-ENC)
- osigurano održavanje (updating).

U narednom trogodišnjem razdoblju:

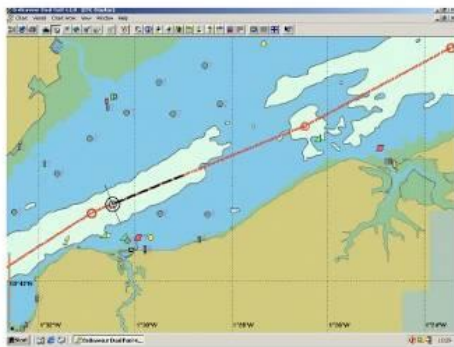
- Uspostavljena je vlastita produkcija ENC's realizacijom CRO – NO HiP projekta;
- Projekt unapređenja kvalitete ENC's
- Osigurano je korištenje ENC's za administrativne potrebe (VTS, SAR, HRM, PoRs,) kroz WMS za ENC's



INTERNATIONAL HYDROGRAPHIC ORGANIZATION



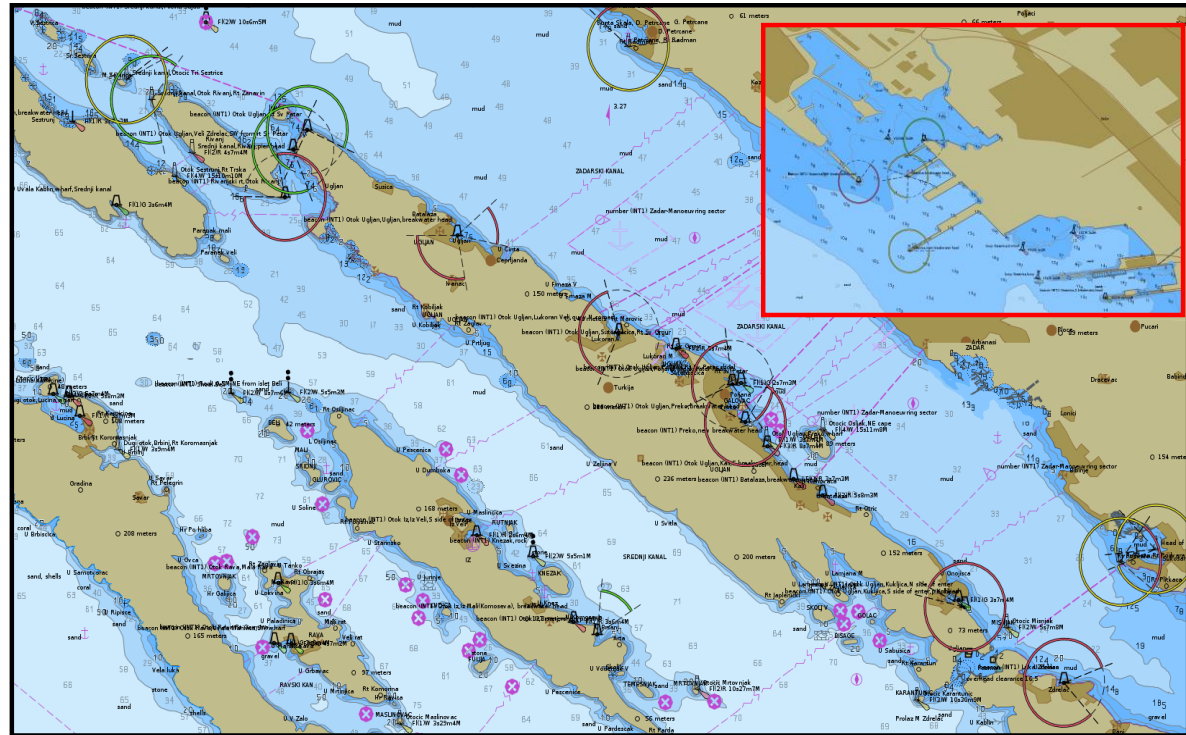
ELECTRONIC NAVIGATIONAL CHARTS (ENCs) “PRODUCTION, MAINTENANCE AND DISTRIBUTION GUIDANCE”



A guide to the requirements and processes necessary
to produce, maintain and distribute ENCs

Publication S-65

Edition 2.0.0, April 2012





Karte – Elektroničke navigacijske karte (ENC) i rasterske navigacijske karte (RNC)

HHI izdaje službene navigacijske karte za područje nadležnosti RH na moru. Osigurano je potpuno pokrivanje u tri navigacijske upotrebne skupine, a u ostale tri skupine parcijalno.

Hrvatske ENC izrađene su prema papirnatim kartama (Paper based ENC).

	Srpanj 2008		Lipanj 2011		Rujan 2014		Rujan 2017	
Namjena i oznaka	Broj ćelija	Pokrivenost područja	Broj ćelija	Pokrivenost područja	Broj ćelija	Pokrivenost područja	Broj ćelija	Pokrivenost područja
Pregledne	1	100%	1	100%	1	100%	1	100%
Generalne	4	100%	4	100%	4	100%	4	100%
Obalne	15	100%	15	100%	15	100%	15	100%
Prilazne	9	72%	12	81%	13	85%	18	88%
Luke	31	77%	37	84%	38	85%	40	88%
Vezovi	20	74%	22	80%	24	85%	55	95%
TOTAL	80	87%	91	91%	95	93%	133	96%

RNCs su dostupne kao Admiralty karte kroz UK HO ARCS prema zaključenom bilateralnom sporazumu.

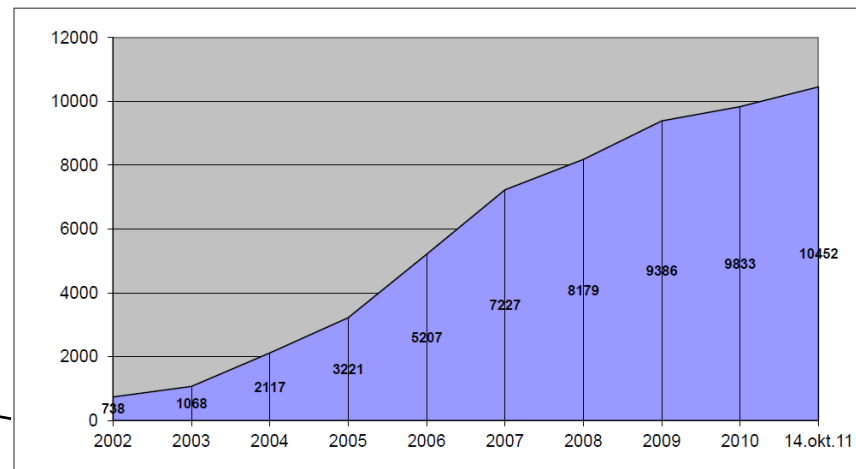
Gdje se mogu nabaviti službeni ENCs?



IHO WEND načela –
RENC distribucija



NORWEGIAN MAPPING
AUTHORITY
HYDROGRAPHIC SERVICE



ic-enc



PRIMAR
Regional ENC Coordinating
Centre
(bilaterals)

NHS VAR
Value Added Reseller
agreements
Distributor agreements



11070 ENC
8000 Updt.
Database

PRIMAR ONLINE™

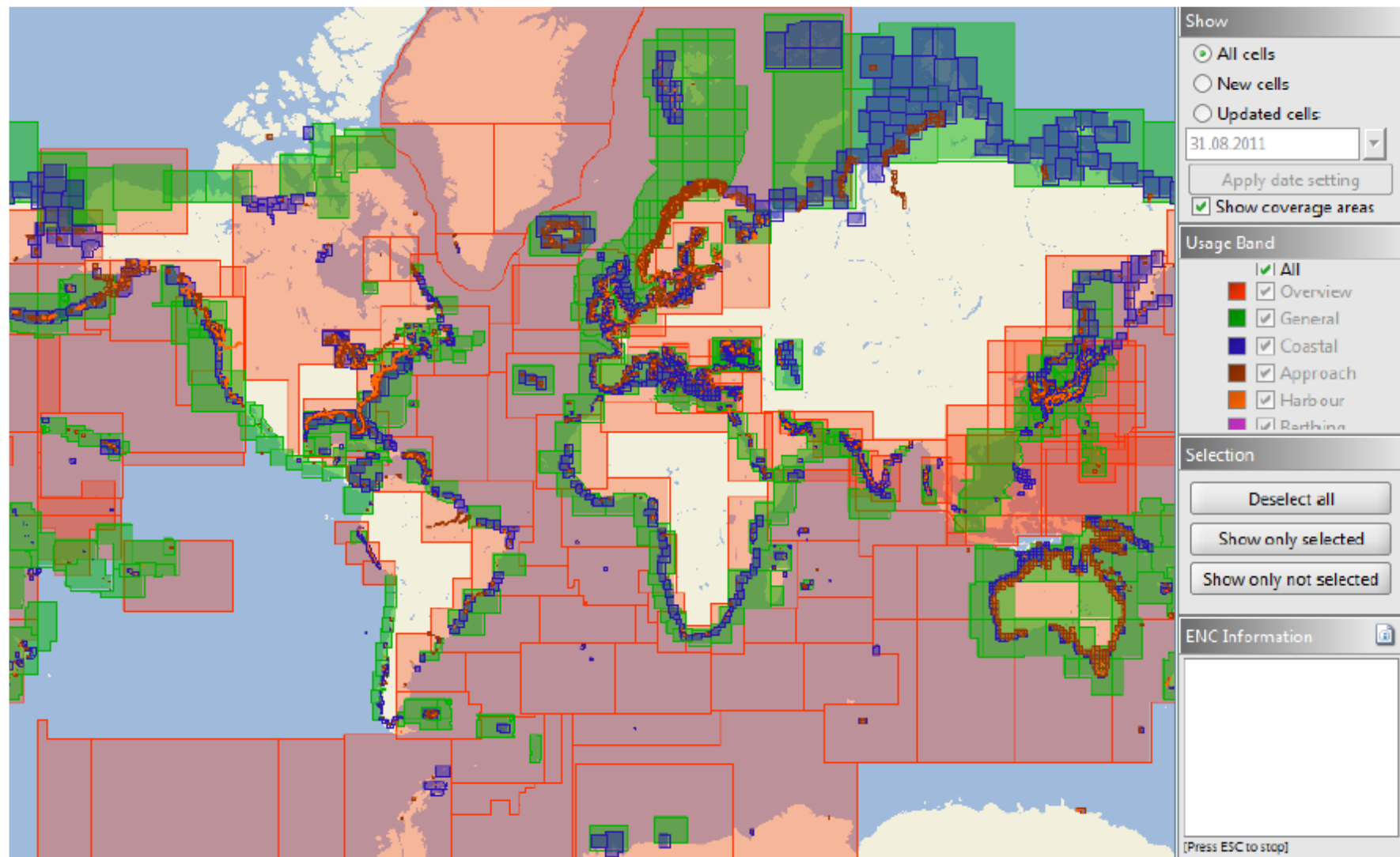
Primar Stavanger ENC Service
Only available via authorized distributors



Pokrivenost s ENC

Primar ENC Service

s oko 20000 ENC pokriva rute između 1700 luka



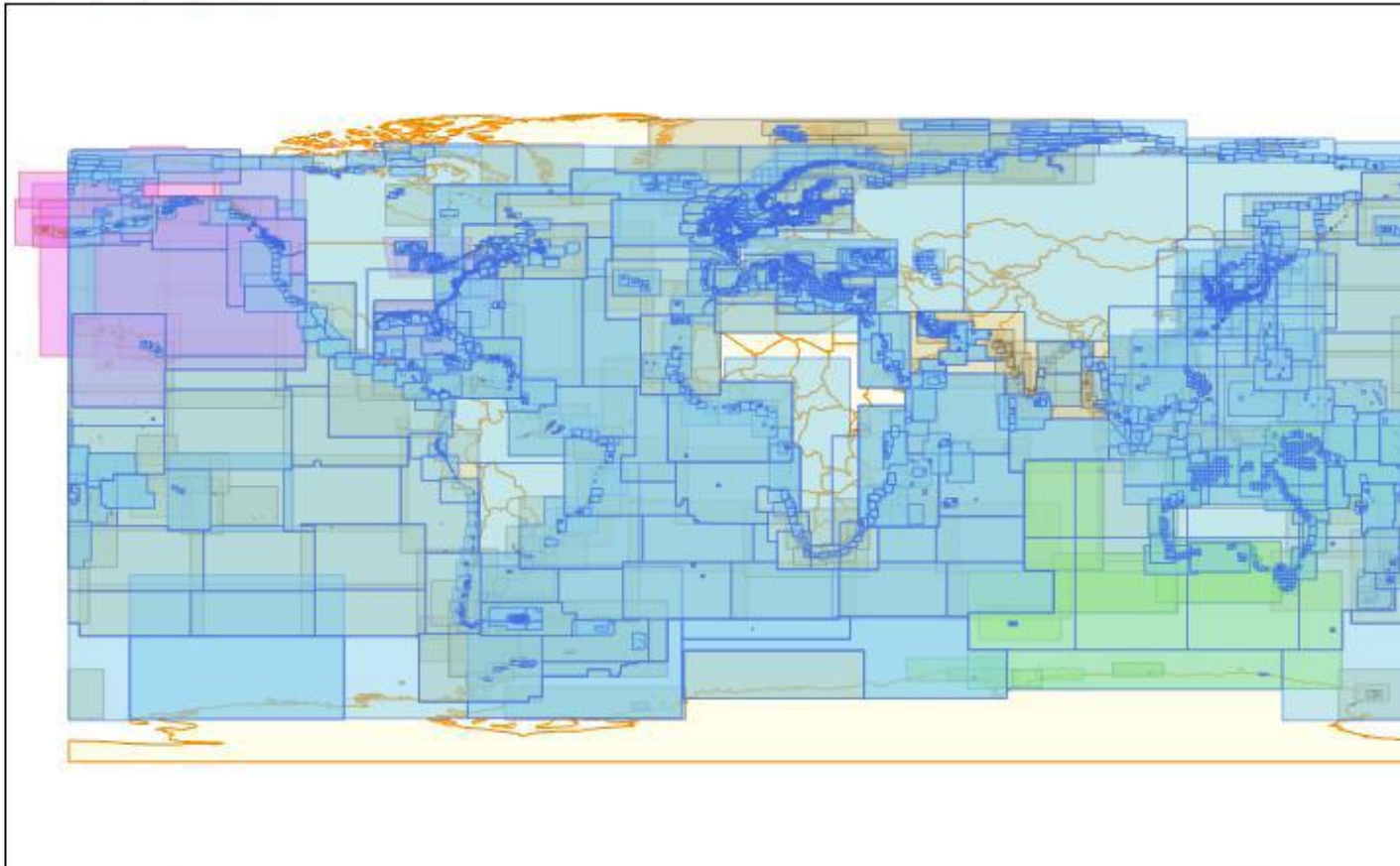
IHO online catalogue for coverage and availability of ENC and RNC



ENC and RNC Coverage Catalogue

(ENC - Electronic Nautical Chart | RNC - Raster Navigational Chart)

Data Layers



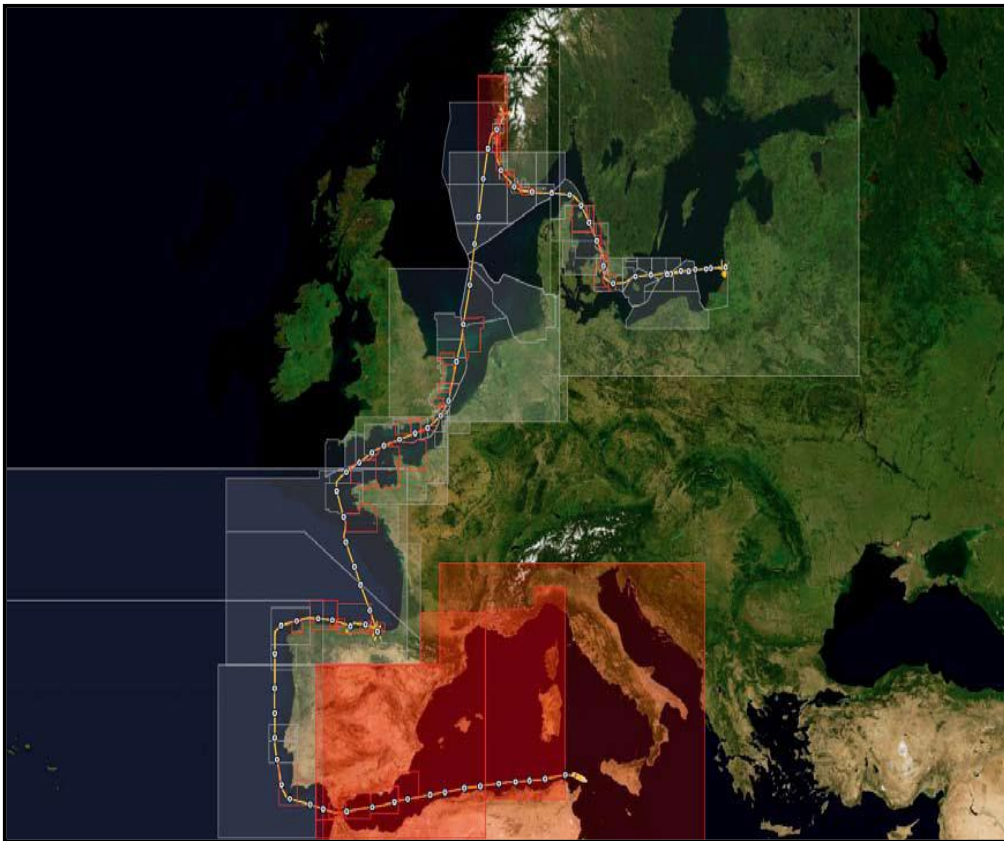
- ☒ ENC
 - ☒ ENCLargeScale
 - ☒ ENCMediumScale
 - ☒ ENCSmallScale
- ☒ RNC - Australia
 - ☒ AusLargeScale
 - ☒ AusMediumScale
 - ☒ AusSmallScale
- ☒ RNC - USA NOS
 - ☒ NOS LargeScale
 - ☒ NOS MediumScale
 - ☒ NOS SmallScale
- ☒ RNC - UKHO
 - ☒ UKHO LargeScale
 - ☒ UKHO MediumScale
 - ☒ UKHO SmallScale
- ☒ BASEMAP Drawing

Apply

Center 7°10.000' W:3°11.293' S

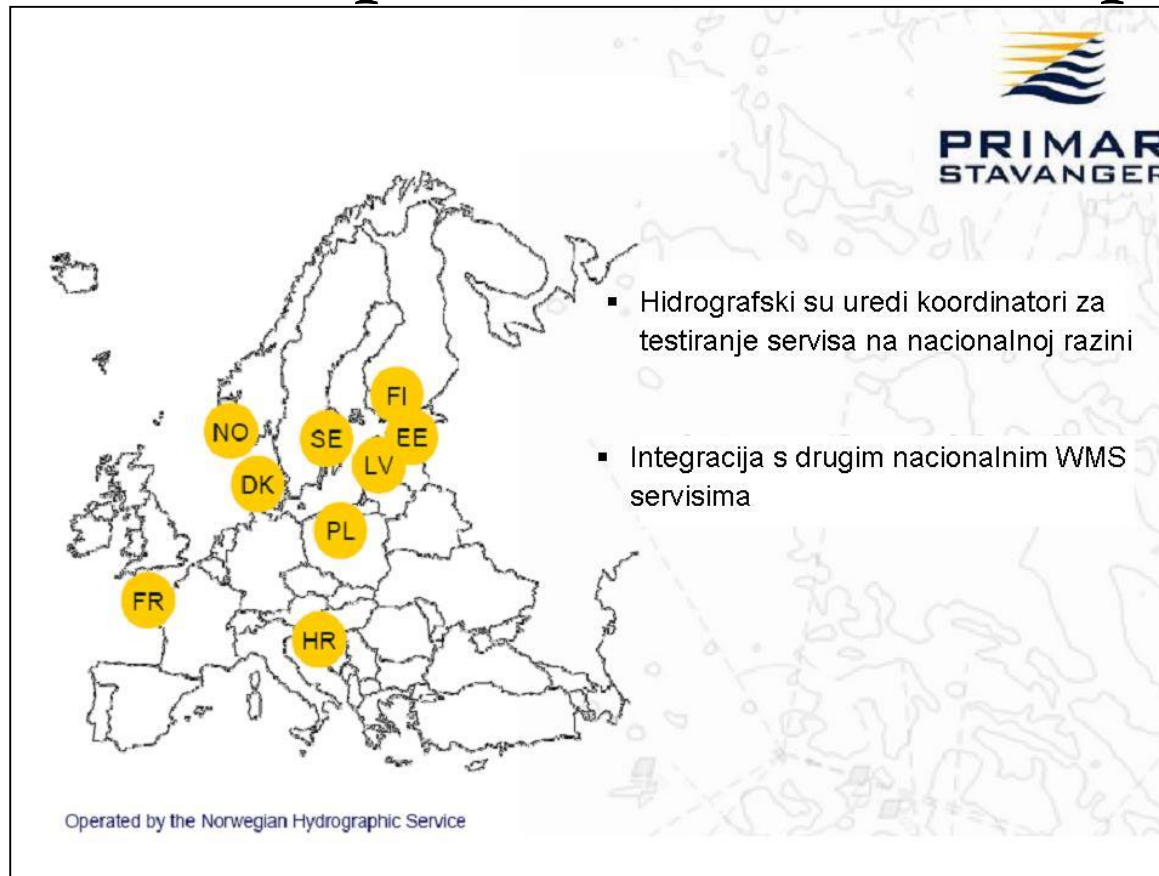
IHB May 2009

Datema ENCTrack - distribucija ENC u suradnji s PRIMAR-om (Pay per View)



- **ENCTrack** revolucionarni sustav distribucije kojim je omogućeno svakom ECDIS učitavanje ENC gdje god se brod nalazio. Nema potrebe planiranja i nabave ENC prije planiranog putovanja niti nove nabave u slučaju neplanirane promjene rute.
- **Sigurnost** – neograničen pristup svim dostupnim ENC
- **Troškovi** – plaća se samo što se koristi; prvi post-paid sistem. 20-50% uštede
- **Sigurnost** – kompatibilan s bilo kojim odobrenim postojećim ECDIS
- **Trošak** - Zero handling
- **Sigurnost** – jednostavno korištenje
- **Trošak** – uključeni troškovi web-based tracking service
- **Sigurnost** - jednostavna updating procedura
- U skladu je s ECDIS 2012 propisima.
- Vrlo pozitivne reakcije korisnika

WMS for ENC's – opcija korištenja ENC za administrativne potrebe -sudionici u projektu

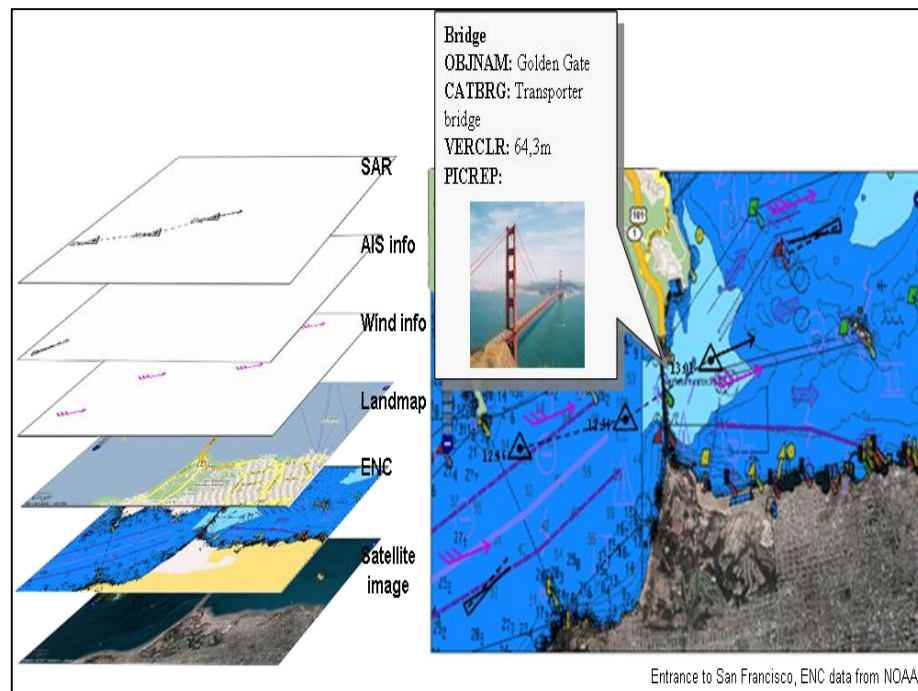
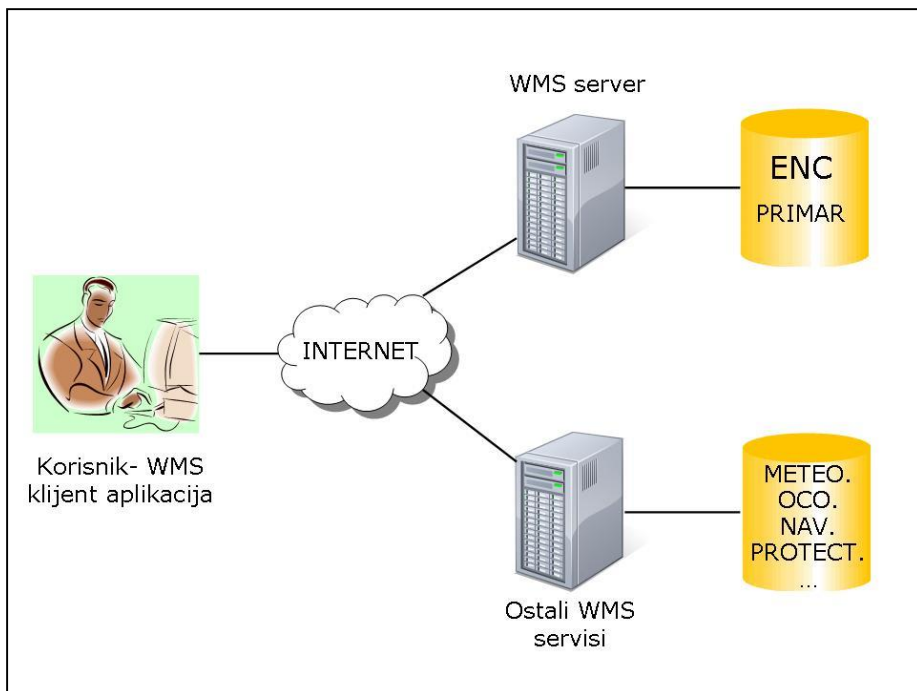


- Cilj je bio da se korisnicima u administraciji omogući brz i jednostavan pristup “slikama” službenim i ažuriranim ENC CHO bez potrebe korištenja ECDIS/ECS uređaja (PC/ WEB).
- HHI kao jedna od članica Primara aktivno je sudjelovala u projektu zajedno s još nekoliko članica PS,
- Hidrografske uredi su usuglasili da dopuste prezentaciju sadržaja svojih ENC prema WMS specifikaciji kroz PRIMAR WMS za ENC,

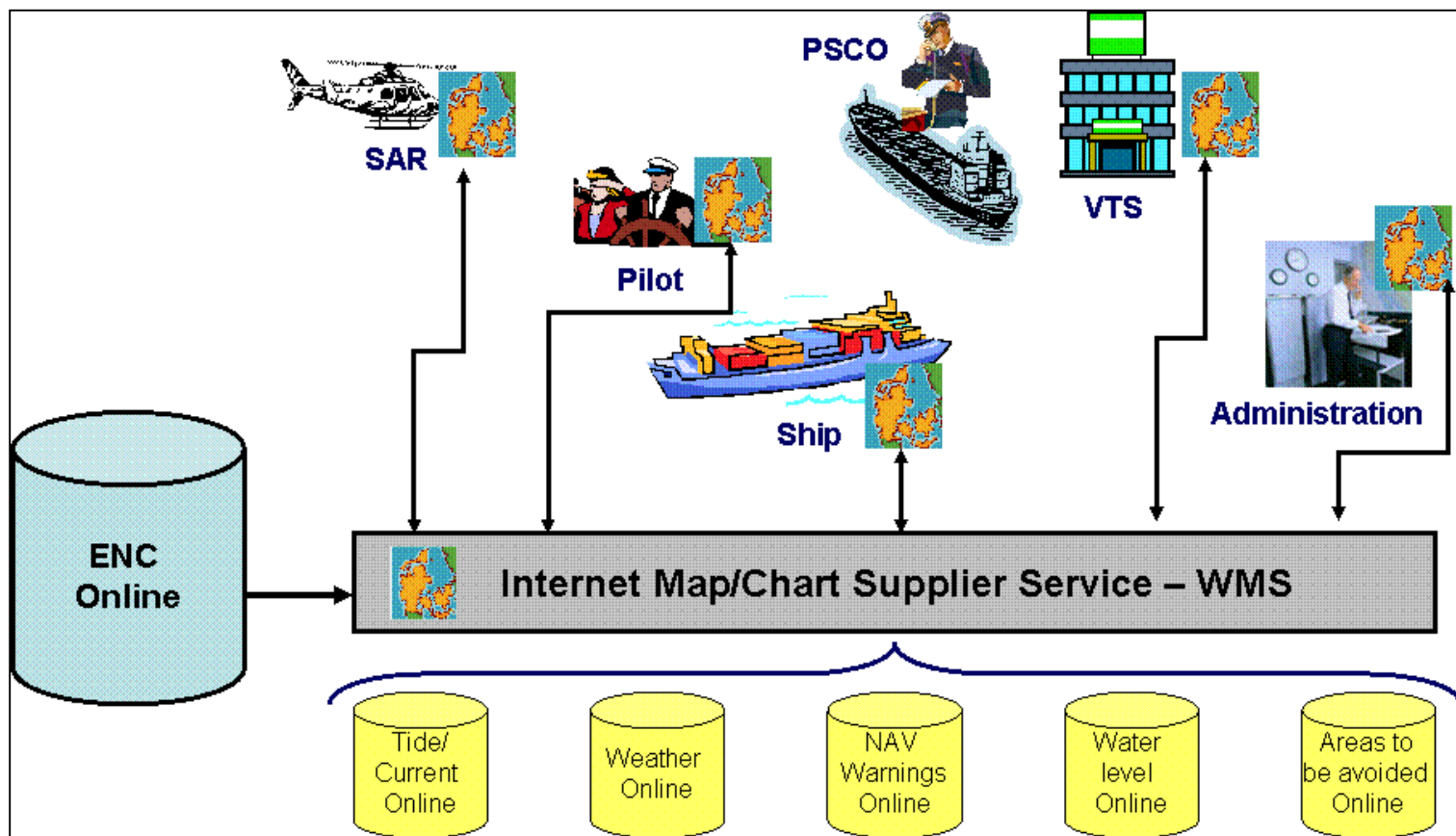


Što je WMS ?

Web Mapping Servis je Internet kartografski standard. WMS standard specificira kako klijent aplikacija potražuje kartografski prikaz s WMS servera. Potraživanje se ostvaruje spajanjem na WMS server i specifikacijom vrste karata koje se želi vidjeti za odgovarajuće geografsko područje.

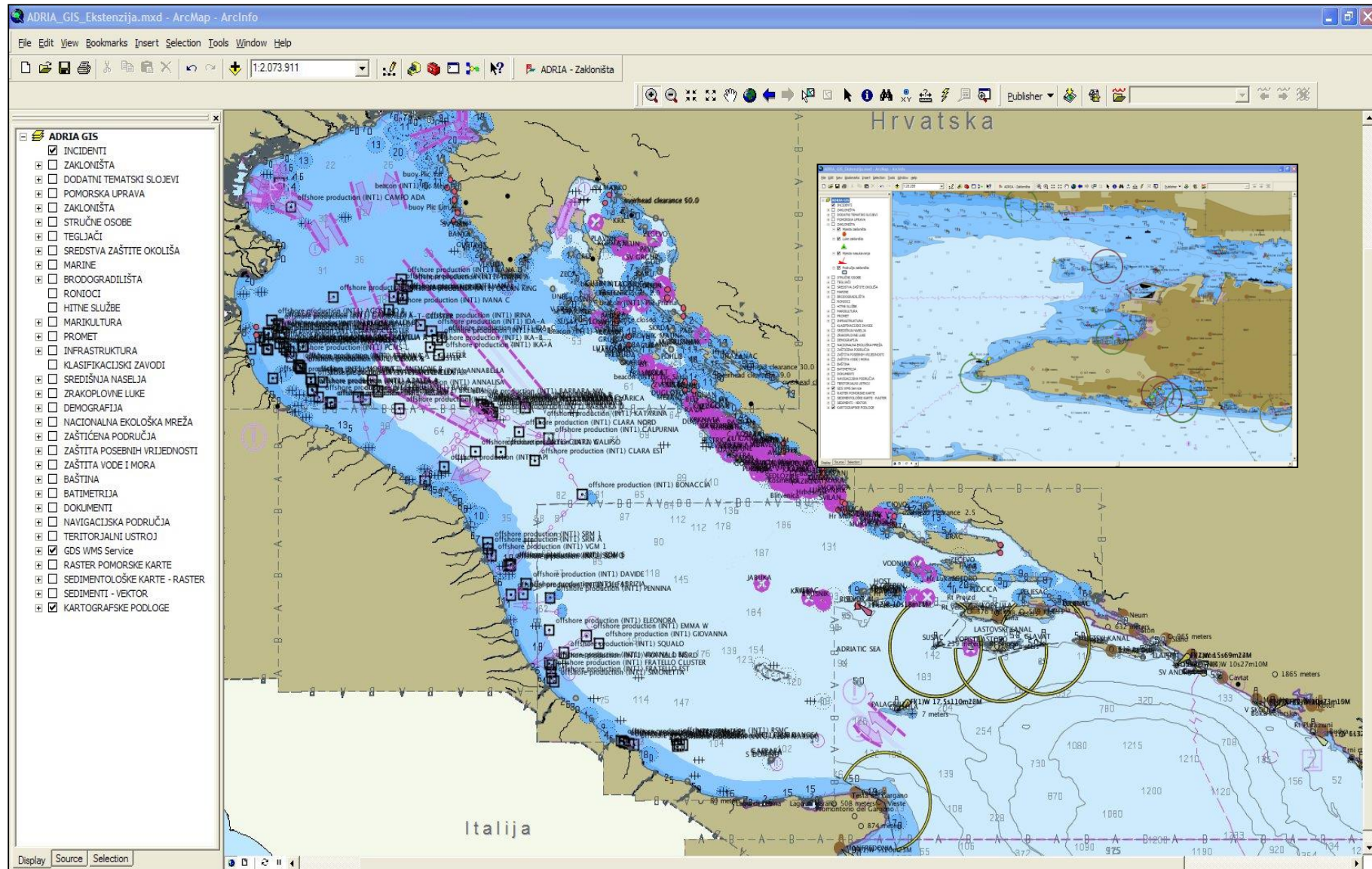


Koncept WMS za ENCs



WMS za ENC je servis koji omogućava prikaz / sliku ENC (ne ćeliju) na PC-u primjenom WMS standarda. Namijenjen je administrativnim korisnicima za ne navigacijske potrebe: planiranje, analize, nadzor, kontrolu kvalitete i sl.

Primjena WMS za ENC u R. Hrvatskoj



Implementacija u MMPI / MRCC u GIS sustavu za podršku odlučivanja kod
zahtjeva broda za mjestom zakloništa



Mogući nedostaci ENC/ECDIS-a i načini rješavanja

- Otkrivanje nedostataka:
 - korisnici (upotrebom)
 - nadležna tijela (u postupku kontrole)

- Primjeri nedostataka otkriveni su:
 - komparativnom analizom IT i HR ENC-ova pomoću PRIMAR-ovog softvera
 - analizom IH i HR ENC na hrvatskom VTS-u

- Aktivnosti nadležnih (IMO, IHO HOs u identificiranju i rješavanju nedostataka

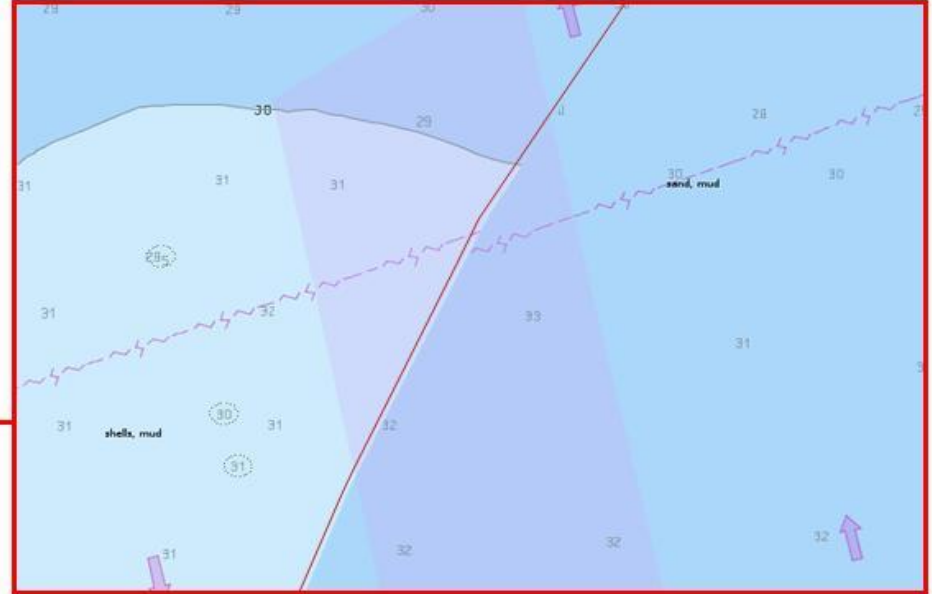
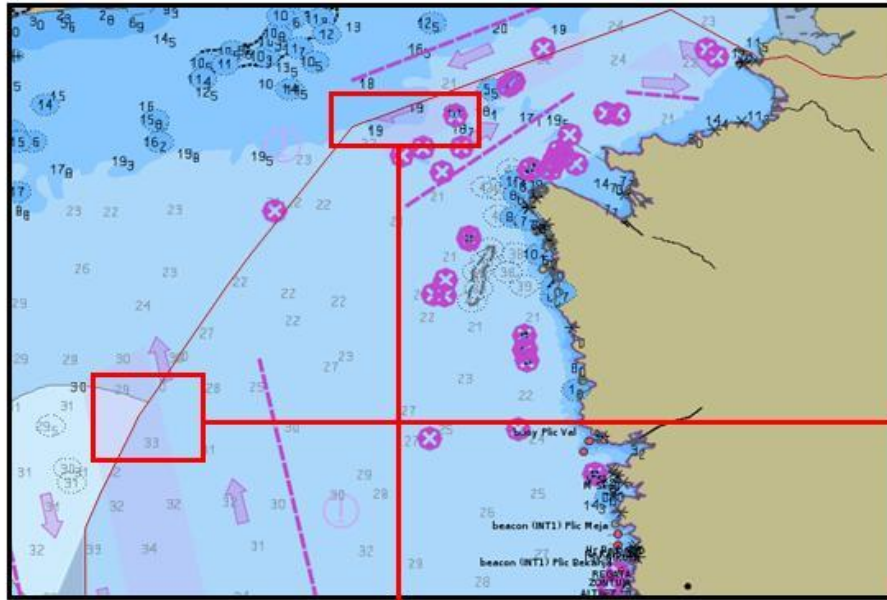


Comparative table with the overlap data of the bordering ENC's



Select style: Full ECDIS		Selected for compare: IT300039,3,1,0	
Object Class	HR3C0015,1,6,0		IT300039,3,1,0
M_NSYS	MARSYS: IALA A Record ID: FE00000000012		MARSYS: IALA A Record ID: FE00000000003
TSEZNE	CATTSS: IMO - adopted Record ID: FE00000000110		CATTSS: IMO - adopted Record ID: FE00000001208
CBSUB			Record ID: FE00000001113
CTNARE	INFORM: WARNING Vessels with a draught greater than 15 m and exceeding a speed of 12kn are prohibited from navigating within 2 miles of the coast between rt Savudrija and Koprski zaliv (see Peljar I). NINFOM: UPOZORENJE Brodovima gaza većeg od 15 m i brzine preko 12 čv zabranjena je plovidba unutar 2 M od obale između rta Savudrija i Koparskog zaljeva (vidi Peljar I). Record ID: FE00000000002		INFORM: Caution Restricted areas: Not all the existing restricted areas are charted. For further details see larger scale charts. Military practice areas: See Pilots Shellfish beds: numerous shellfish beds are present off the shore between Sistiana and Grignano, and eastward/southward of Pt. Sottile. See larger scale charts. NINFOM: Avvertenze Zone di divieto: Non tutte le zone di divieto sono rappresentate. Consultare le carte particolari. Zone di esercitazioni: per le zone di esercitazioni militari consultare il Portolano Zone di allevamento di molluschi - nelle acque antistanti il litorale compreso tra Sistiana e Grignano e quello immediatamente a levante ed a Sud di Punta Sottile sono presenti numerose zone adibite a mitilicoltura. Consultare le carte a scala maggiore. Record ID: FE00000000352
DEPARE	DRVAL1: 20 DRVAL2: 50 Record ID: FE0000000471		DRVAL1: 30 DRVAL2: 50 Record ID: FE00000000046

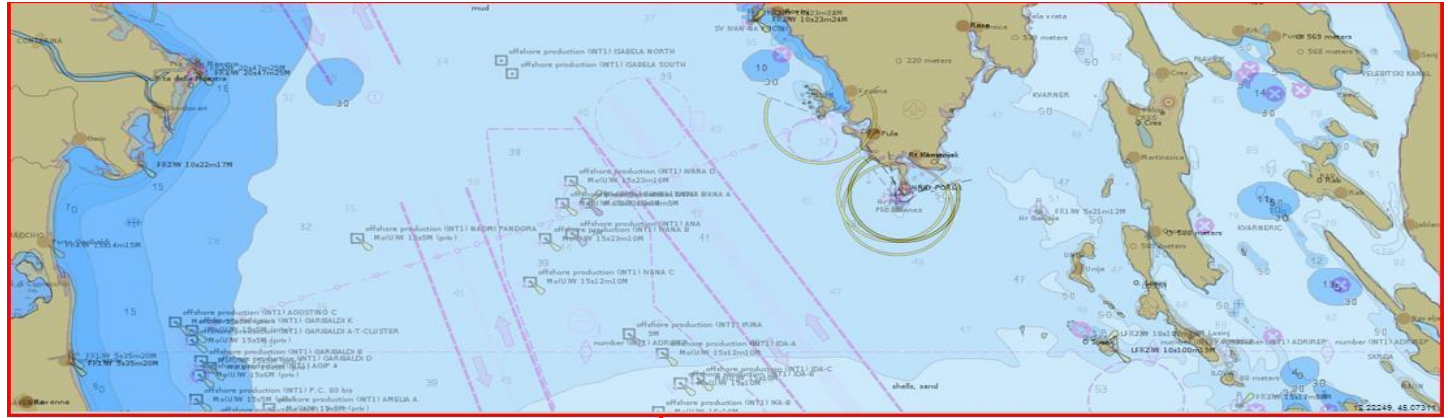
An example of cross border inconsistency IT_HR Costal ENC's (HR3C0015 - IT300039)



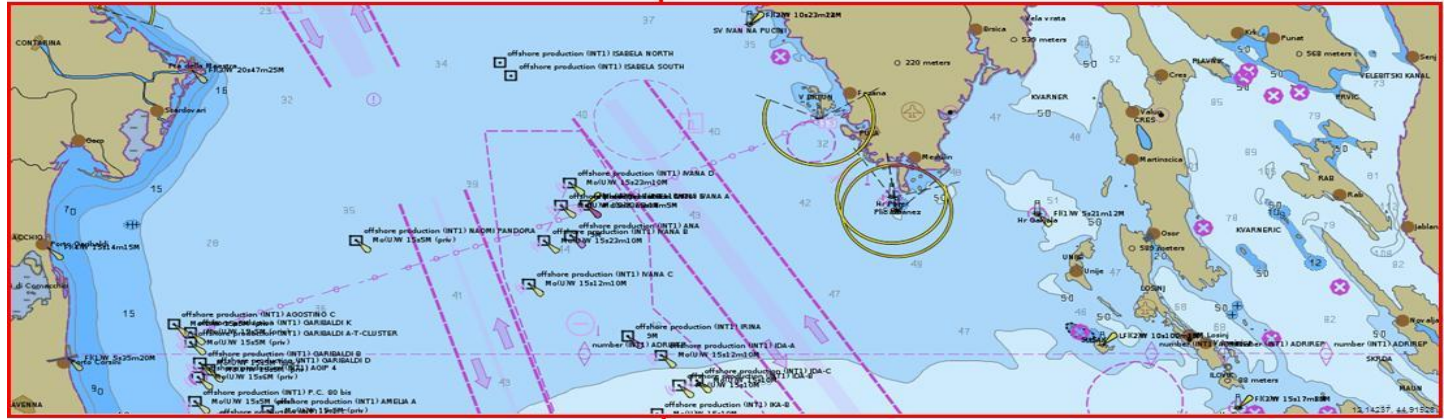
Differences in the amount of ENC data content HR100101 - IT100340



Preklop HR-IT



HR
1:800.000



IT
1:1.500.000



Discrepancies of the same objects HR100101 - IT100340



Preklop HR-IT



HR
1:800.000



IT
1:1.500.000

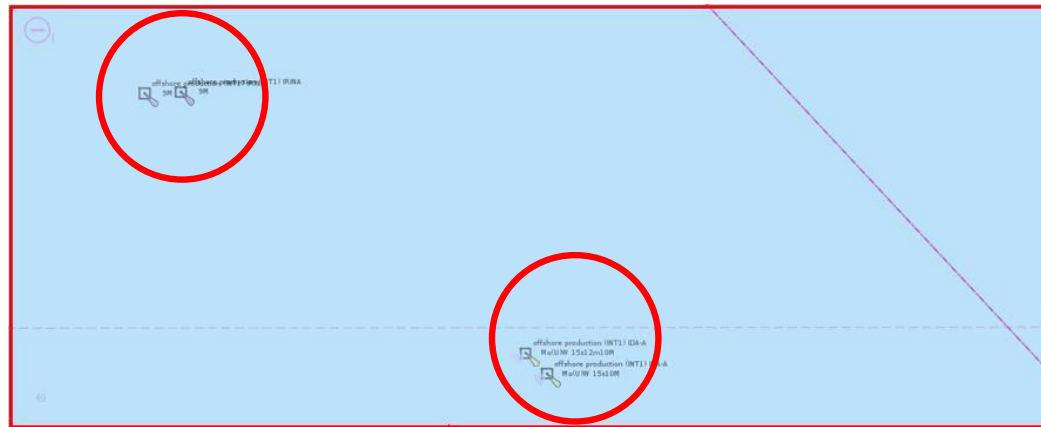


This map displays the offshore oil and gas fields in the northern part of the Gulf of Mexico. It shows various production facilities, including offshore production (INT) and offshore production (INT) facilities, and their coordinates. The map also includes labels for various oil and gas fields, such as the offshore production (INT) facilities, and the coordinates of the fields. The map is a detailed representation of the offshore oil and gas fields in the northern part of the Gulf of Mexico.

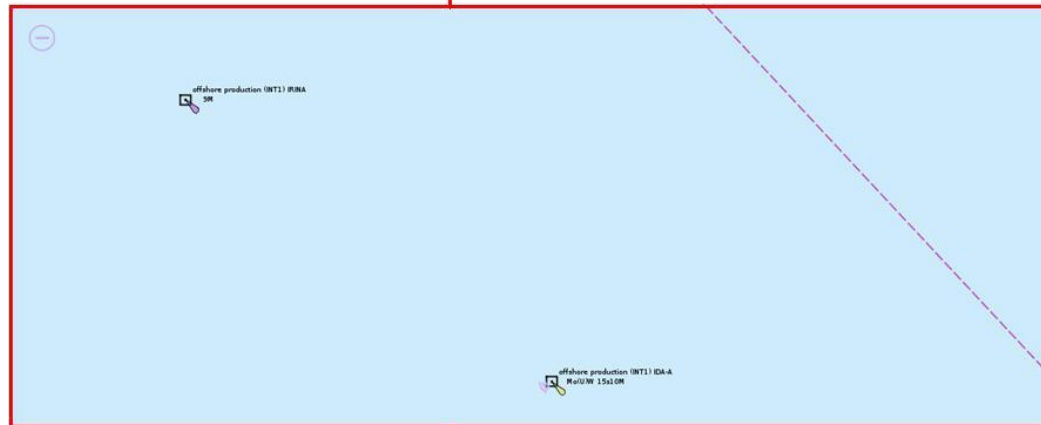
Discrepancies of the same objects HR200031 – IT200435



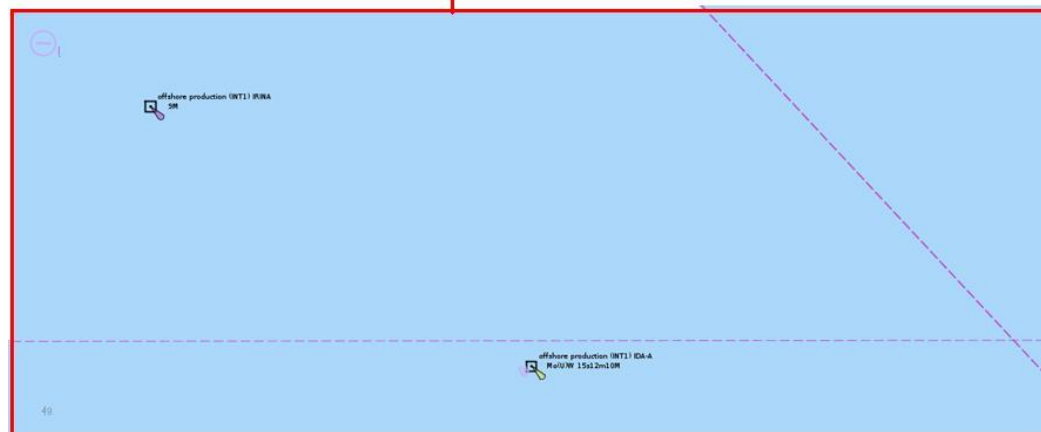
Preklop HR-IT



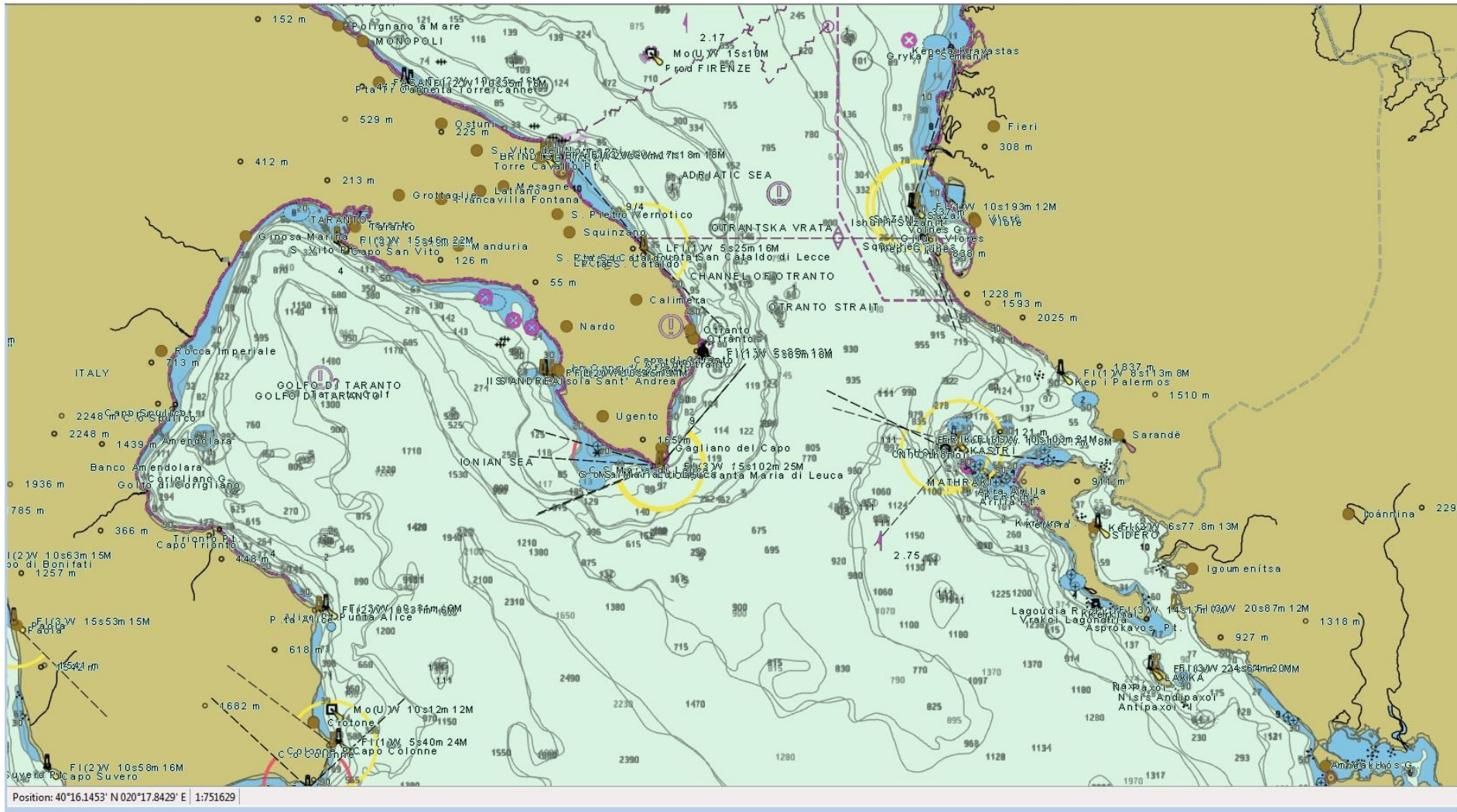
HR
1:300.000



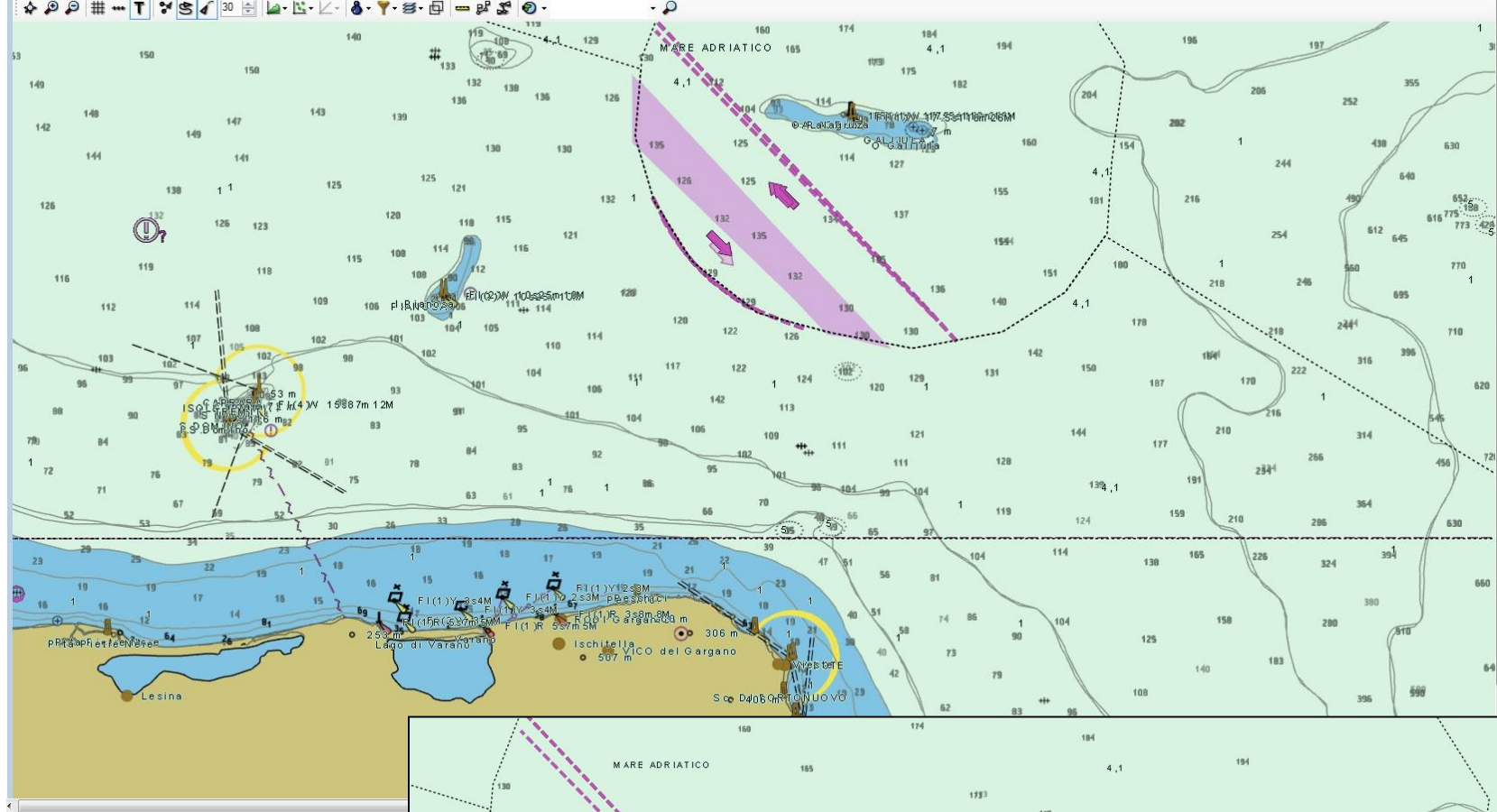
IT
1:700.000



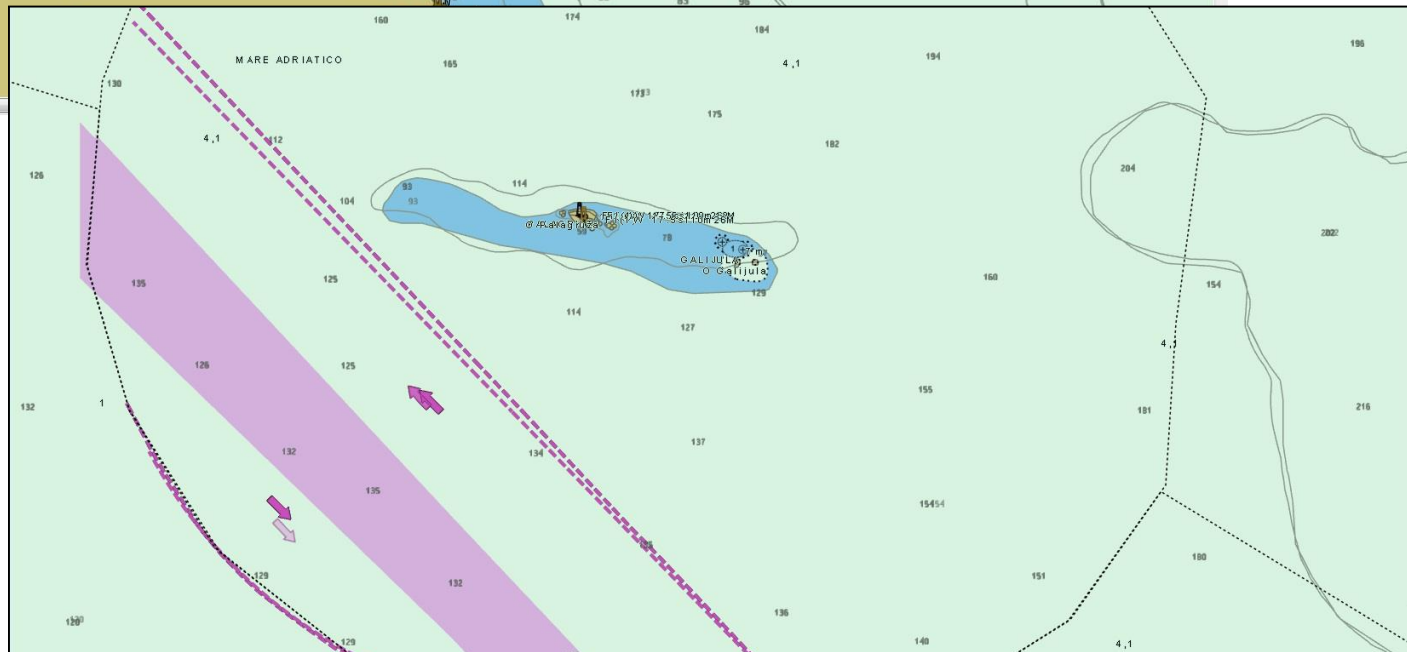
Primjer preklopa HR i IT ENC-ova UB 1

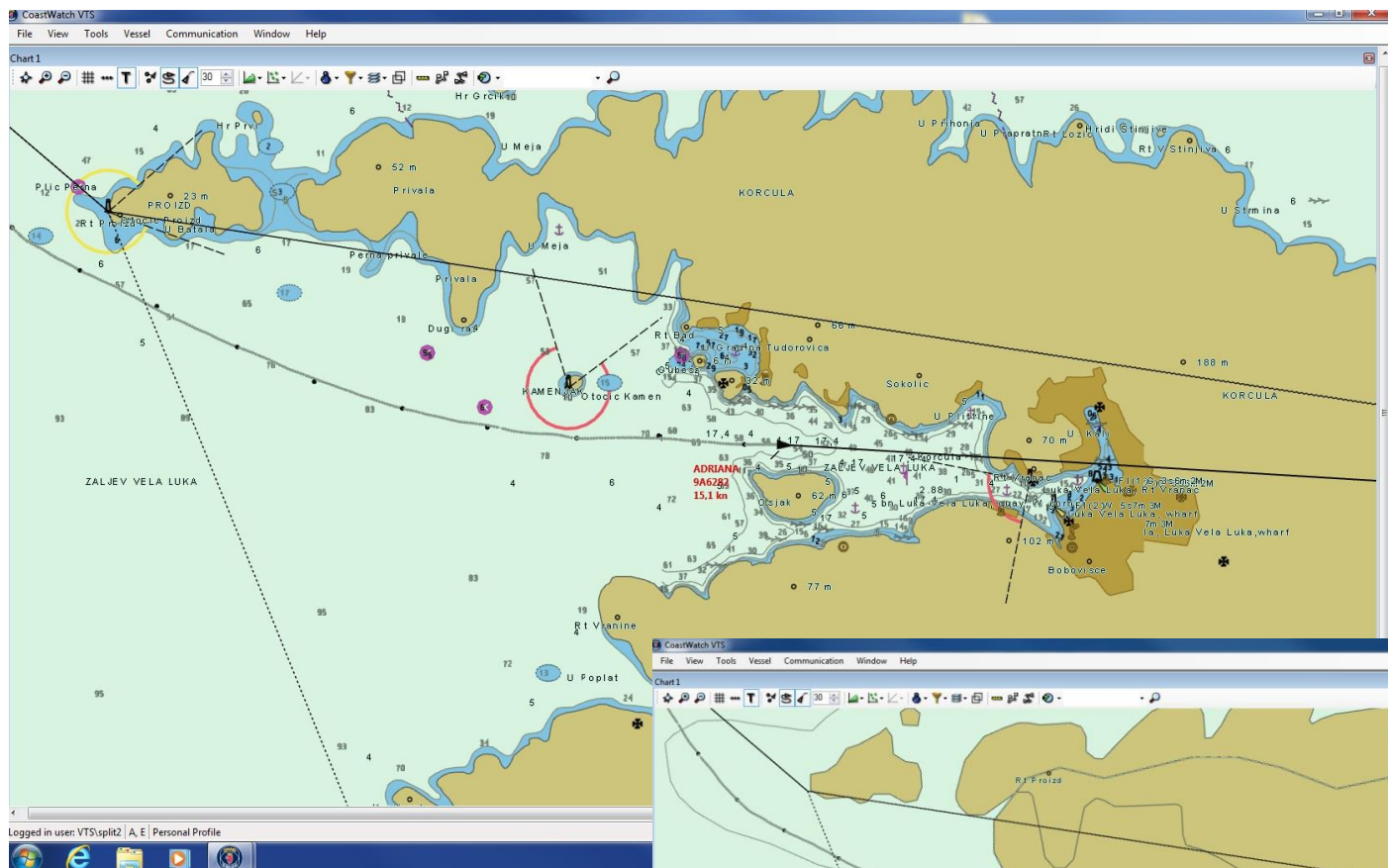


HR VTS CW

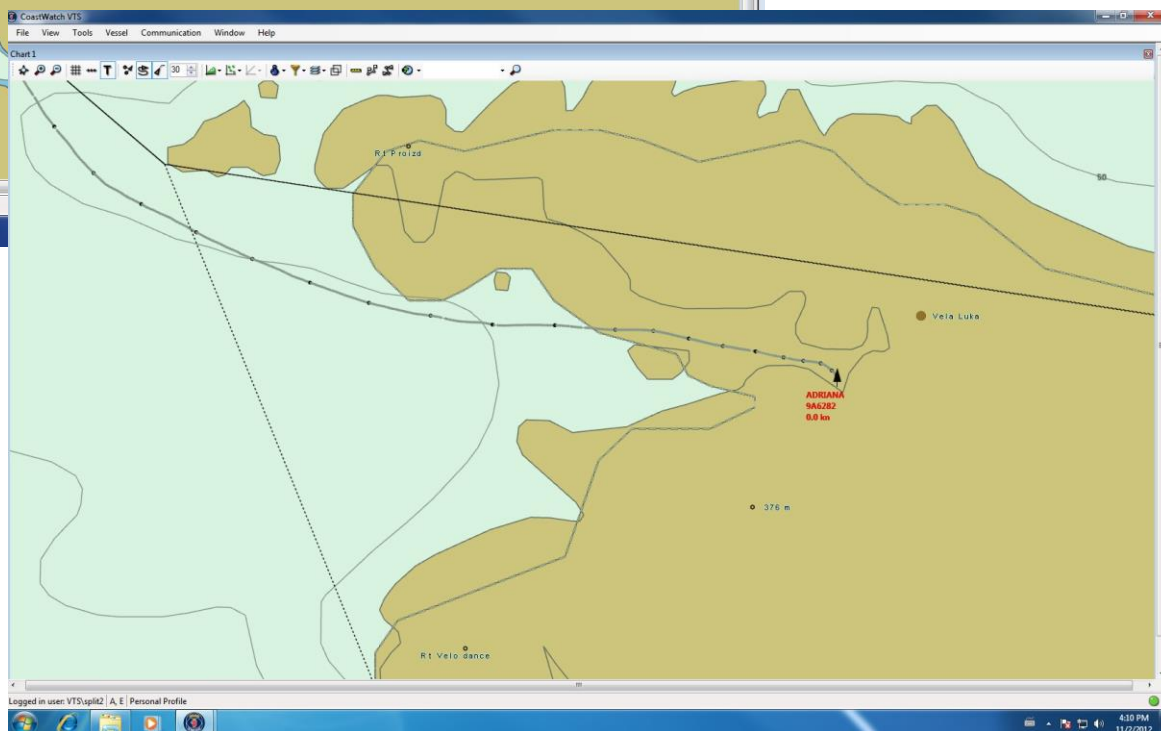


HR VTS CW

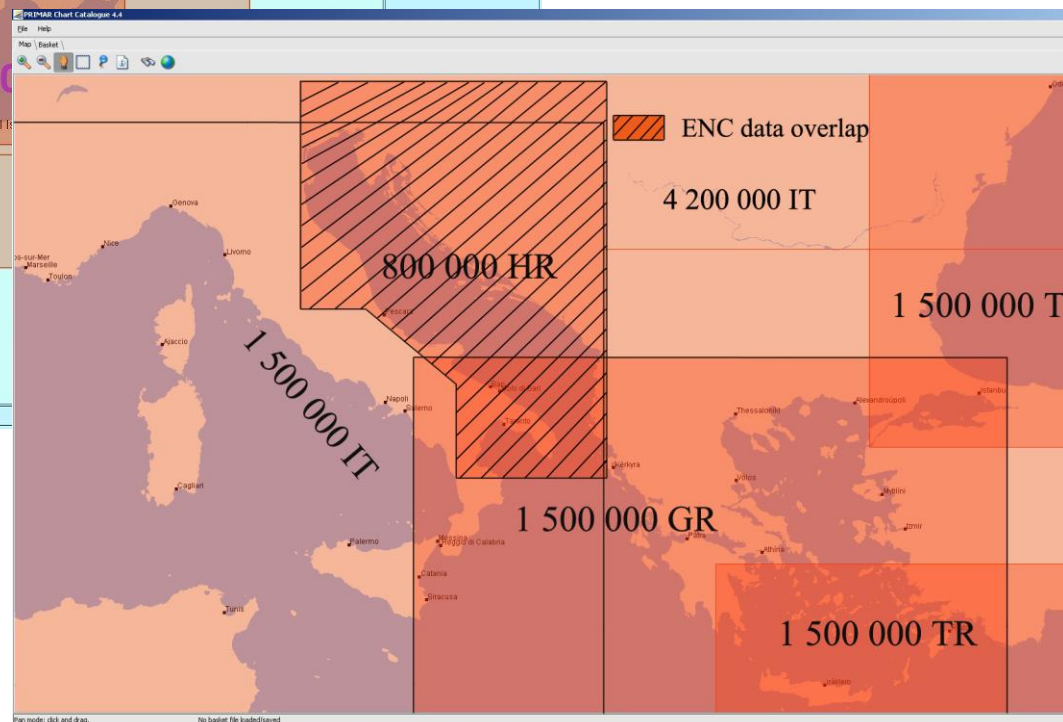
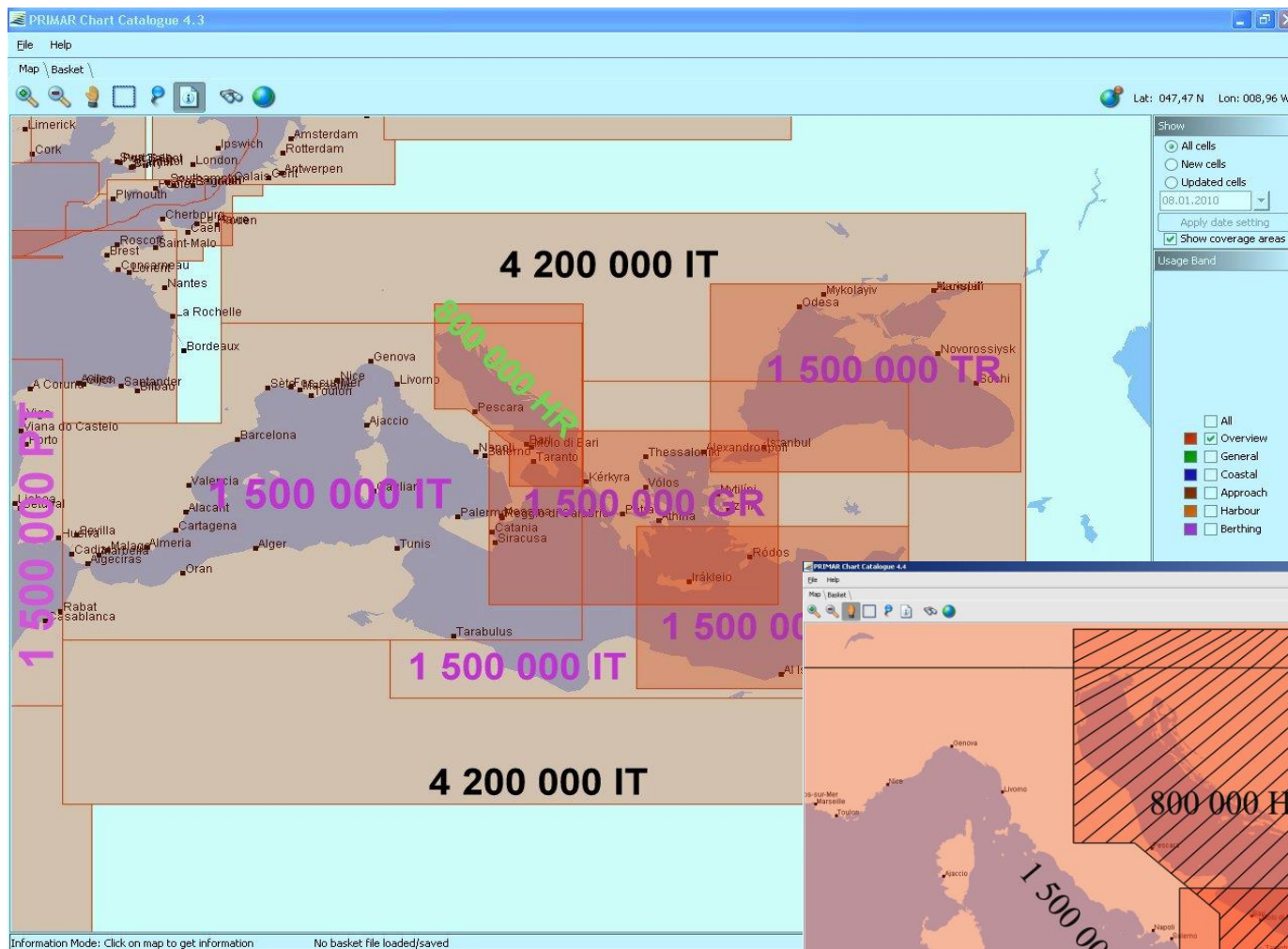




HR VTS

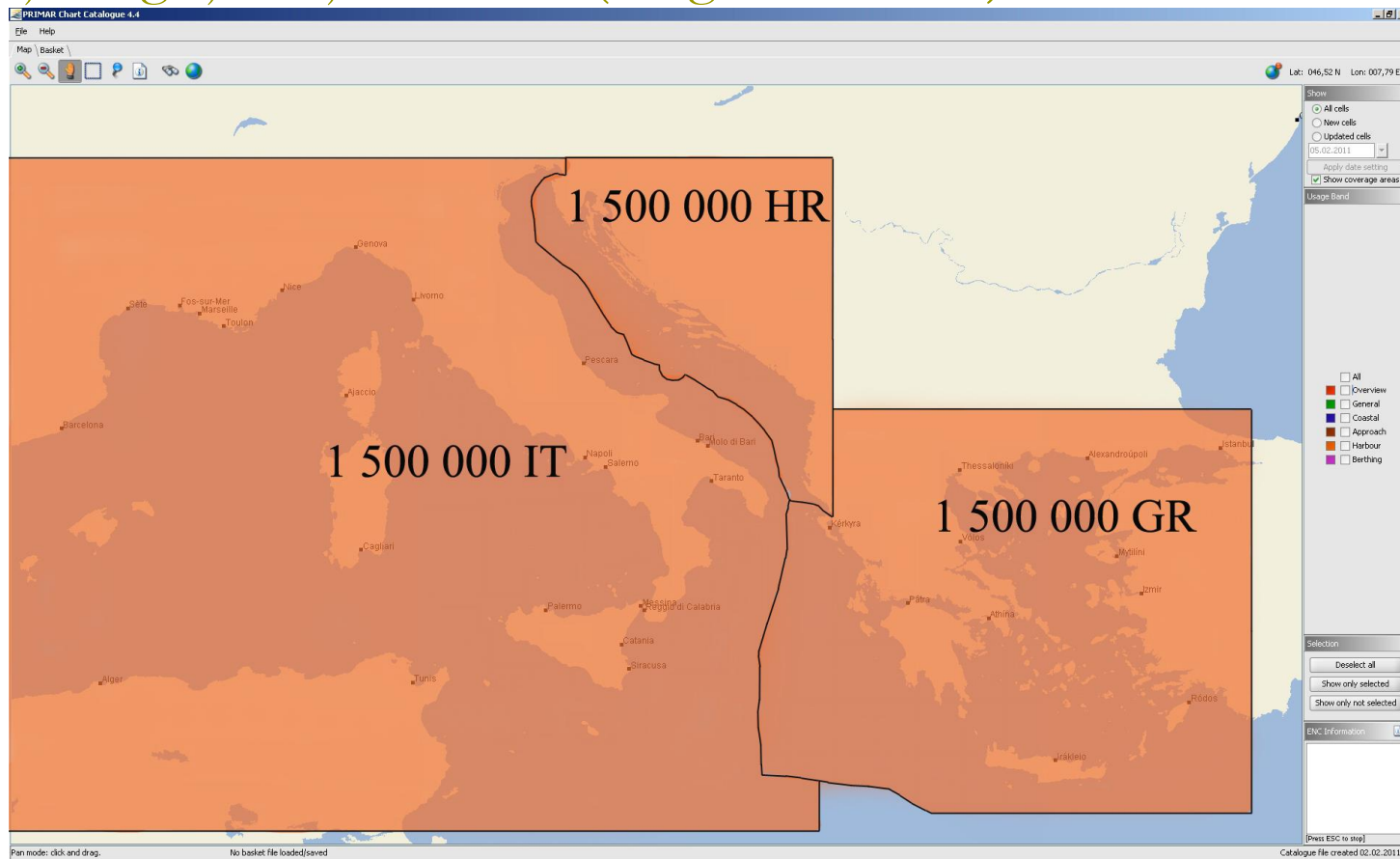


Mogući nedostaci ENC/ECDIS-a i načini rješavanja



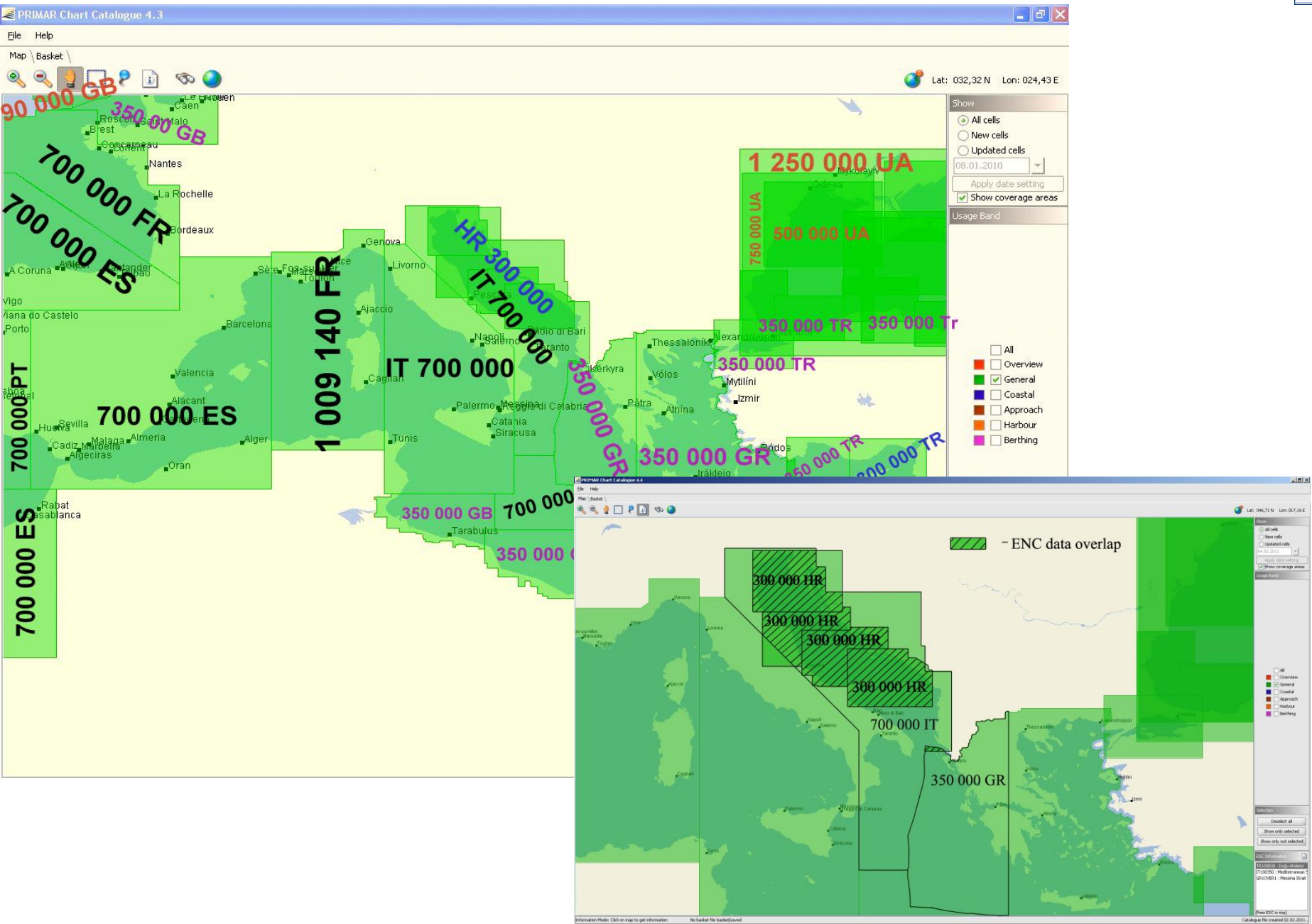
**Problem preklapanja preglednih HR/IT
ENC – nije u skladu s IHO/WEND
načelima**

Prijedlog rješenja za UB 1 (Pregledne ENC)

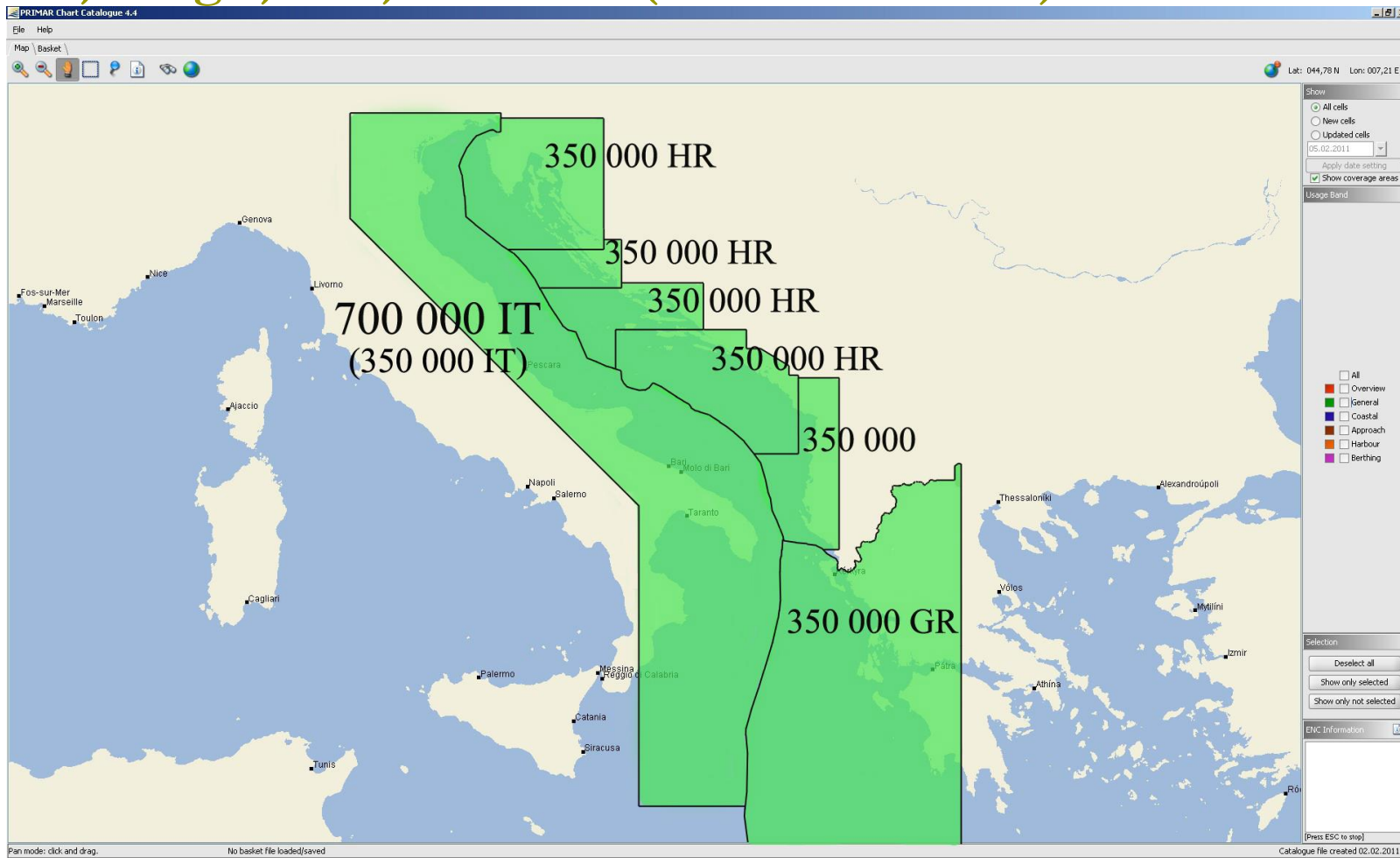


Pregledna ENC

- HR će izraditi novu ćeliju u sastavljačkom mjerilu 1:1 500 000 za područje svoje nadležnosti;
- Nova ćelija sadržavat će i podatke područja nadležnosti Republike Albanije, Crne Gore i Slovenije uz suglasnost navedenih država;
- HR će izdati novu ćeliju 01.07.2012.;
- IT bi istog datuma trebala biti spremna izdati novu ćeliju na kojoj bi trebao biti izostavljen sadržaj nove ćelije u izdanju HR



Prijedlog rješenja za UB 2 (Generalne ENC)



Generalne ENC

- HR će izraditi nove 4 ćelije u sastavljačkom mjerilu 1:350 000 za područje svoje nadležnosti;
- Nova ćelija sadržavat će i podatke područja nadležnosti Republike Albanije, Crne Gore i Slovenije uz suglasnost navedenih država;
- HR će izdati nove ćelije 01.07. 2012.;
- IT bi istog datuma trebala biti spremna izdati novu ćeliju na kojoj bi trebao biti izostavljen sadržaj nove ćelije u izdanju HR;

Dubine 15 i 12 m kodirane kao pliće od ostalih područja dubina nevidljive u *Standard* i *Base* ECDIS prikazu

INTERNATIONAL HYDROGRAPHIC BUREAU
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PRINCIPALITE DE MONACO

BUREAU HYDROGRAPHIQUE INTERNATIONAL
Tel : +377.93.10.81.00
Fax : +377.93.10.81.40
e-mail : info@ihb.mc
web : www.ihb.int

IHB File No. S3/8152

15 February 2010

Hydrographers of ENC Producer States:

Argentina, Australia, Belgium, Bahrain, Brazil, Canada, Chile, China, Croatia, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, India, Indonesia, Italy, Japan, Rep. of Korea, Latvia, Mexico, Malaysia, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Russian Federation, Singapore, S. Africa, Spain, Sweden, Turkey, Ukraine, UK, USA, Venezuela.

For Information:

The Managers:
Primar, IC-ENC, AmRENC

THIS LETTER REQUESTS AN IMMEDIATE RESPONSE

URGENT RE-EXAMINATION OF ENC DATA

Dear Hydrographer,

- The Directing Committee has been informed by the Chairman of the IHO Hydrographic Services and Standards Committee (HSSC) of a potentially serious issue that has come to light that may affect your published ENC data. The Chairman's letter is shown at Annex A. It seems probable that some ENC Producer States may not have fully understood the safety implications behind the advice contained in ENC Encoding Bulletin 27 issued in April 2009. As a result, ENC producer States may not have taken appropriate action, especially in relation to ENC's that were already published before Encoding Bulletin 27 was issued.
- Encoding Bulletin 27, which is reproduced at Annex B to this letter, alerts ENC producers to the fact that great care must be taken when encoding isolated shoal depths, such as those often marked as 'reported' on paper charts, and which represent a hazard to navigation. Failure to encode these shoal depths as explained in Encoding Bulletin 27 will result in the depth not being displayed in ECDIS operating in the 'standard display' mode. Most significantly, and not explicitly explained in Encoding Bulletin 27, is that on most ECDIS those same shoal depths will not trigger any automatic grounding alarms in any mode of display.
- The Chairman of HSSC first became aware of a problem after a maritime delegation visiting the UKHO expressed concern when they saw an area that they were familiar with displayed in ECDIS. The ECDIS was loaded with ENC data that was being reviewed prior to issue. In that data, a significant shoal was not presented to the mariner, nor was any anti-grounding alarm activated in the ECDIS. Alerted by this, the UKHO decided to sample its

Dubine 15 i 12 m kodirane kao prepreke ili dodatnom izobatom vidljive u svakom ECDIS prikazu (*Standard* i *Base*)

IHO CL 90_2012 – Kodiranje kružnih svjetala (bez sektora)



Kodiranje all-round svjetala s atributima attributes SECTR1=0 and SECTR2=360, - smetnje na ekranu ECDIS-a

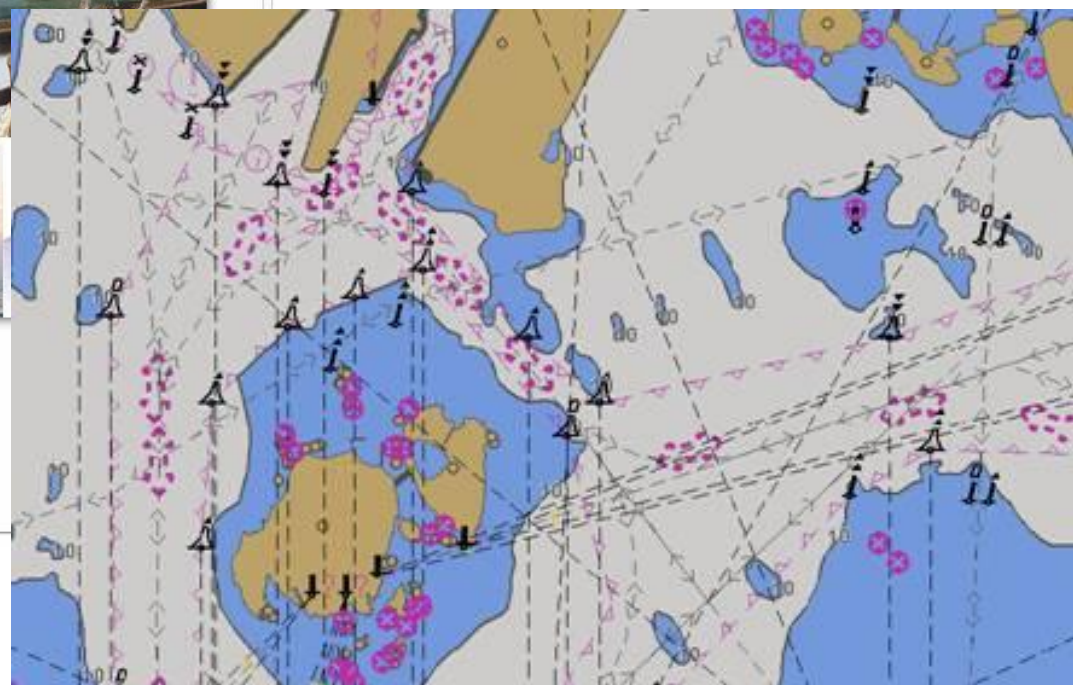
Home

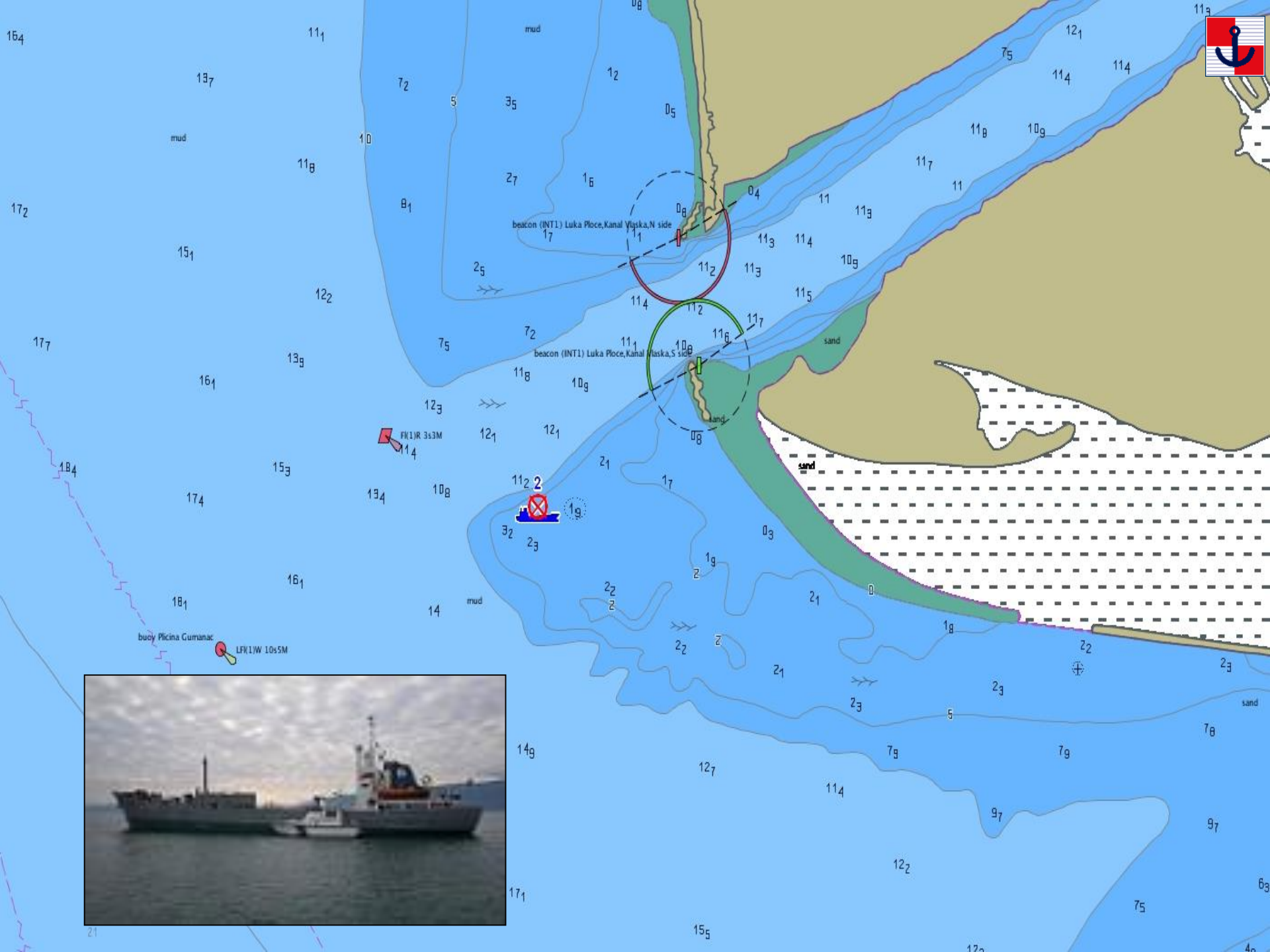


Important information

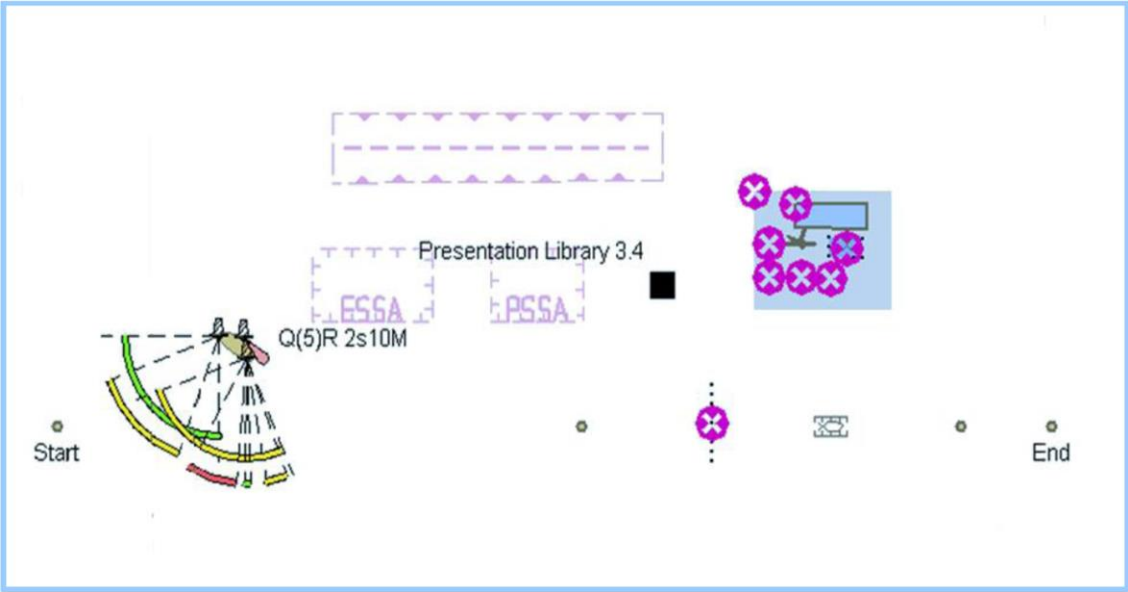
Encoding of all-round (OMNI-Directional) lights in ENC

See Circular Letter 90 and Encoding Bulletin 53



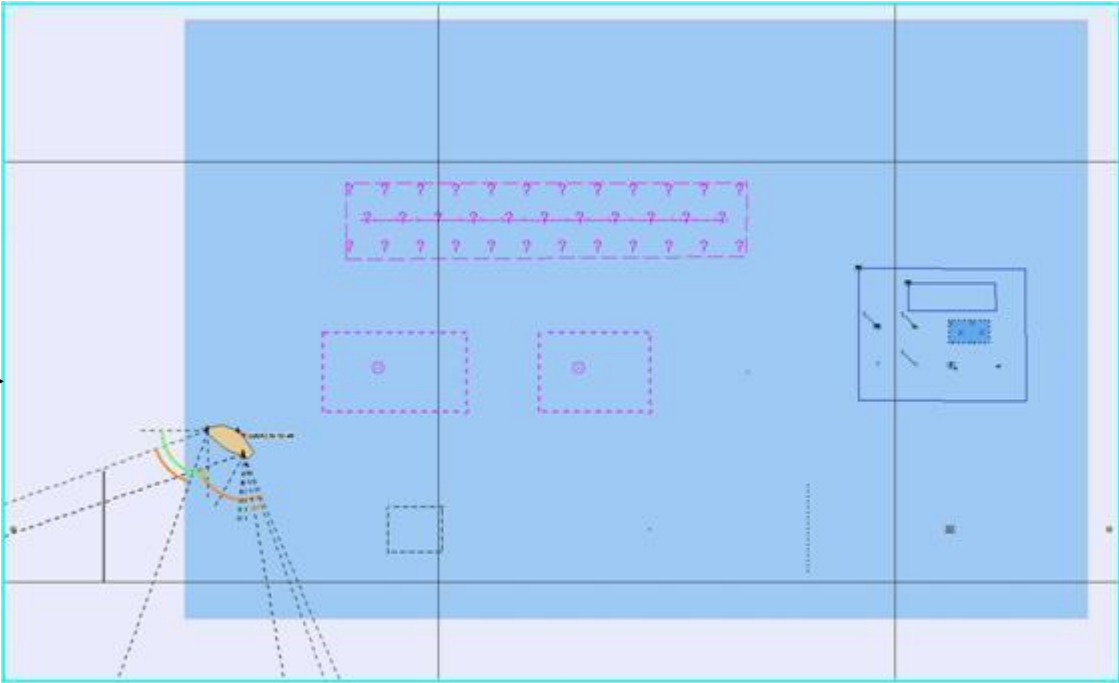


Otkrivanje i rješavanje mogućih nedostataka ECDIS-a pomoću testnih ćelija IHO-a

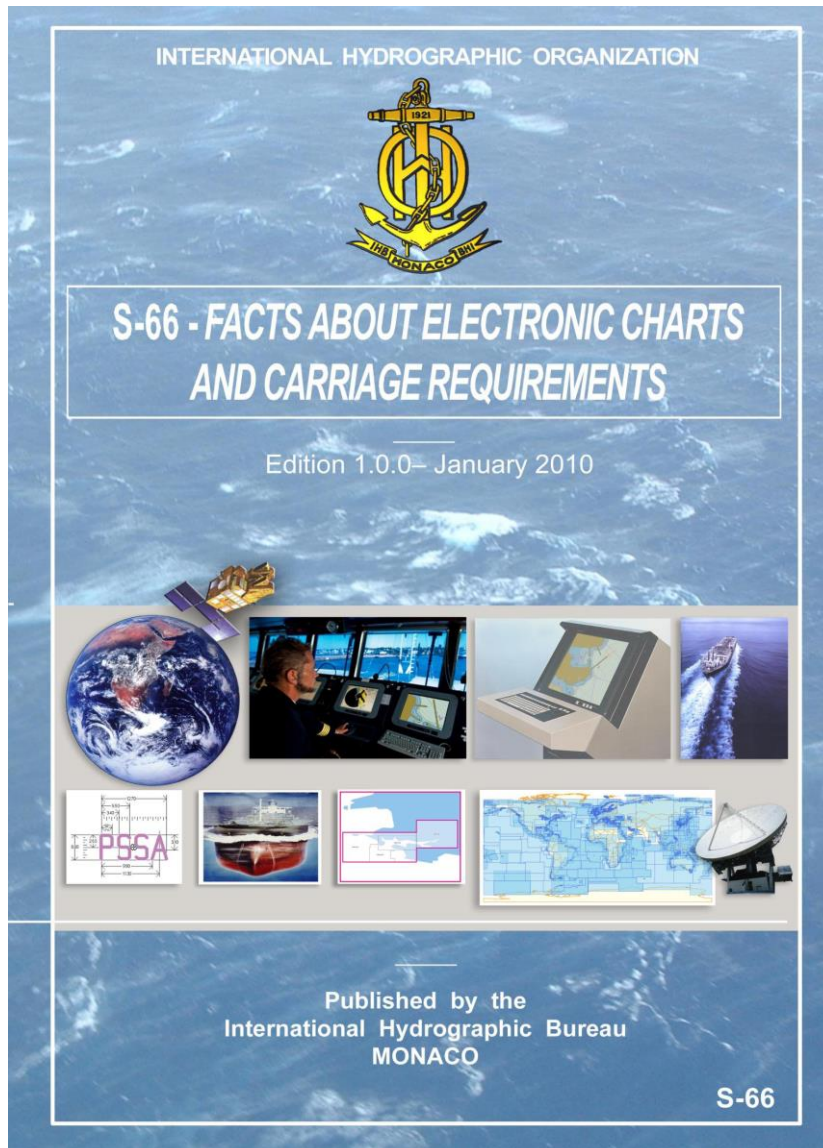


Ispravan prikaz sadržaja testnih ćelija IHO-a

Neispravan prikaz sadržaja testnih ćelija IHO-a



Zajednički rad na informiranju



❑ Facts about charts and carriage requirements

- IHO - Primar Stavanger – IC-ENC UK HO
- Working Group on information (PSIWG)

www.iho-ohi.net/iho_pubs/standard/S-66

Osposobljavanje za korišćenje ECDIS-a



□ The Regulators

□ **STCW** (Manila Amendments to the STCW Code)

“The officer in charge of the navigational watch shall have full knowledge of the location and operation of all safety and navigational equipment on board the ship and shall be aware and take account of the operating limitations of such equipment.”

“Officers of the navigational watch shall be thoroughly familiar with the use of all electronic navigational aids carried, including their capabilities and limitations, and shall use each of these aids when appropriate.”

□ **ISM Code**

ISM Code section demanding to identify and provide proper training specific to onboard duties prior to boarding:

“The Company should ensure that each ship is manned with qualified, certified and medically fit seafarers in accordance with national and international requirements.

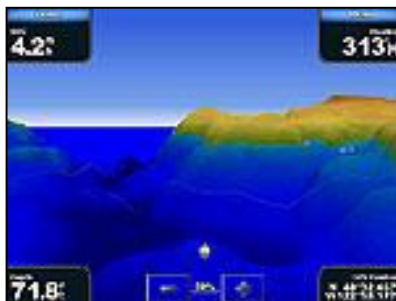
„The Company should establish procedures to ensure that new personnel and personnel transferred to new assignments related to safety ... are given proper familiarization with their duties. Instructions which are essential to be provided prior to sailing should be identified, documented and given.”

„The Company should establish and maintain procedures for identifying any training which may be required in support of the safety management system and ensure that such training is provided for all personnel concerned.”

□ **Port State Control** (Committee Instruction 35/2002/02):

“5.3.2 Are the master and deck watch keeping officers able to produce appropriate documentation that generic and type specific ECDIS familiarisation has been undertaken?”

NON-SOLAS MOGUĆNOSTI

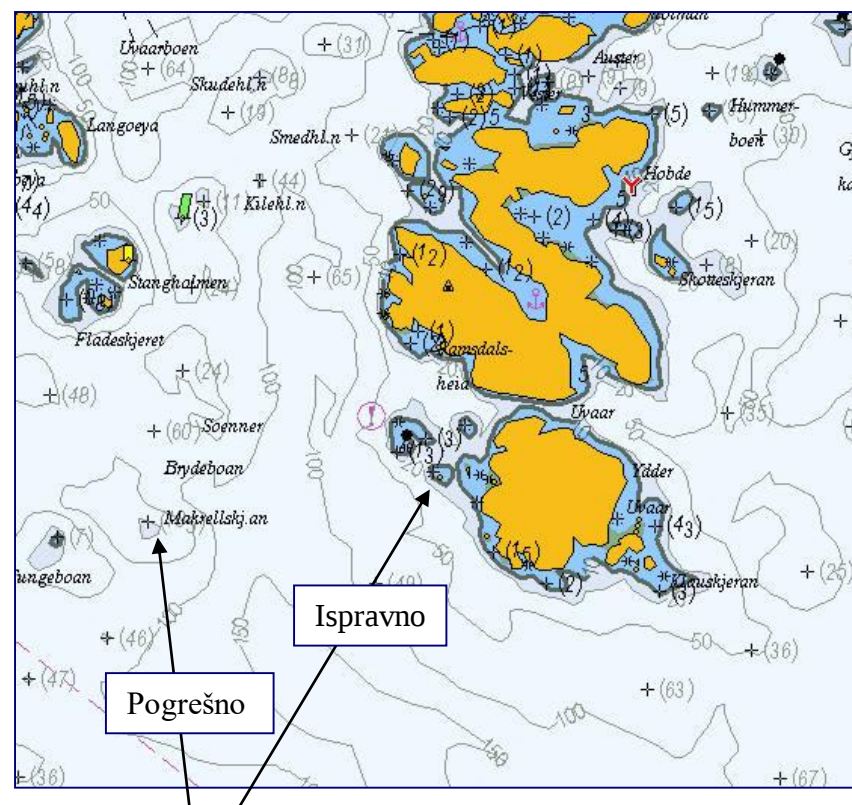


ECS (Electronic Chart System) omogućavaju elektronički prikaz pozicije broda, na karti i druge informacije iz ECS baze podataka na ekranu, ali ne udovoljava IMO zahtjevima za ECDIS.



Neslužbene elektroničke karte (ECS)

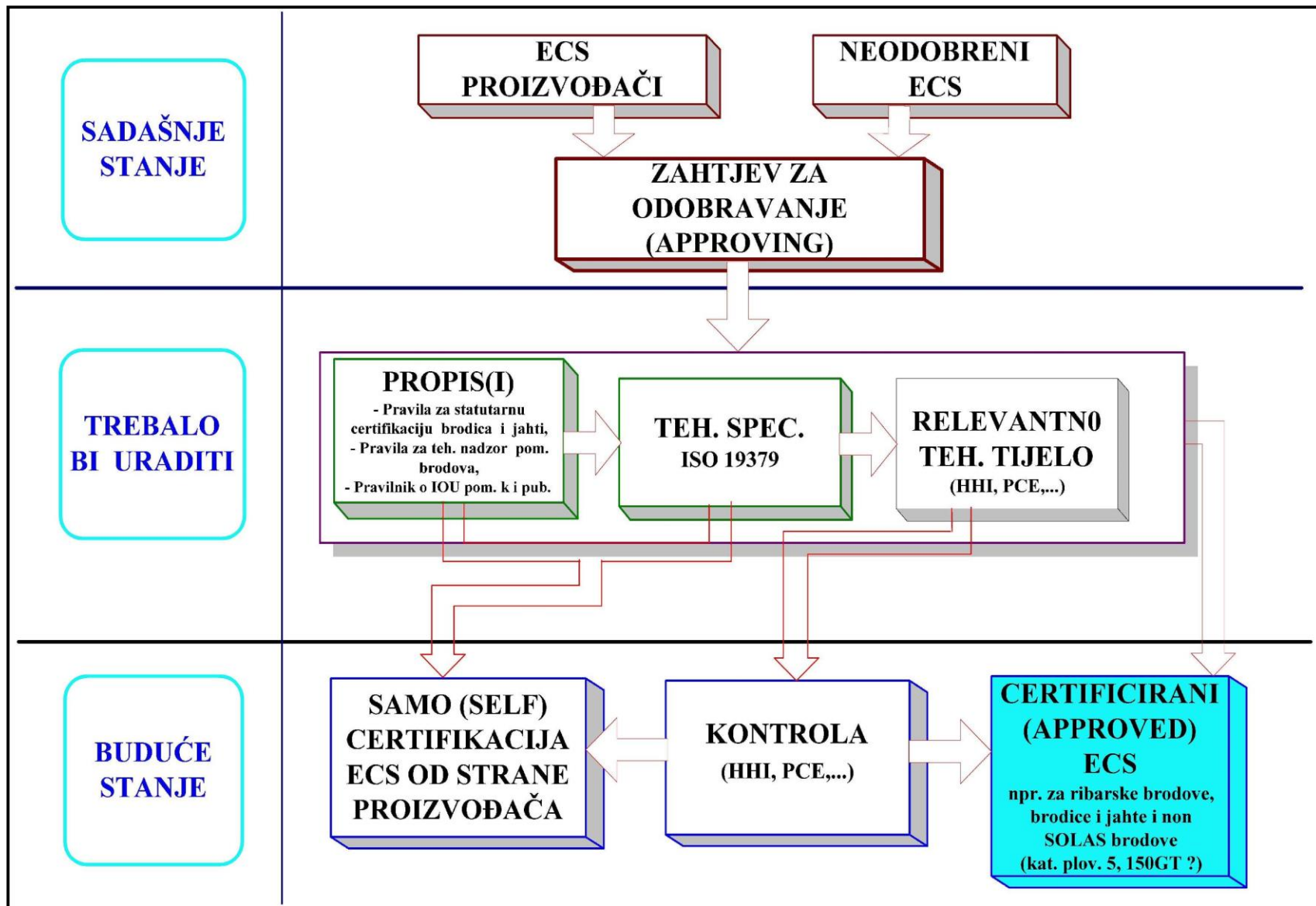
- ❑ Mogu izgledati vrlo lijepo
- ❑ Mogu biti vrlo funkcionalne
- ❑ Mogu biti vrlo prihvatljive u odnosu na cijenu i funkcionalnost
- ❑ **ALI:**
- ❑ Ne mogu se smatrati službenim navig. pomaglima.
- ❑ Nema odgovorne osobe za točnost i kvalitetu karata
- ❑ **Isplati li se preuzeti rizik ?????????**



Privatna vektorska karta gdje je npr. naziv hridi na pogrešnoj poziciji



NON-SOLAS MOGUĆNOSTI





PLOVITE ŠIGURNO SA SLUŽBENIM KARTAMA

