Brazilian Complementary River Aids for Inland ENC

IEHG – Oct 2008

Brazilian Maritime Authority Regulations on Aids to Navigation NORMAM-17

“The Hydrography and Navigation Directorate (DHN) has the following attributions regarding the establishment of aids to navigation:

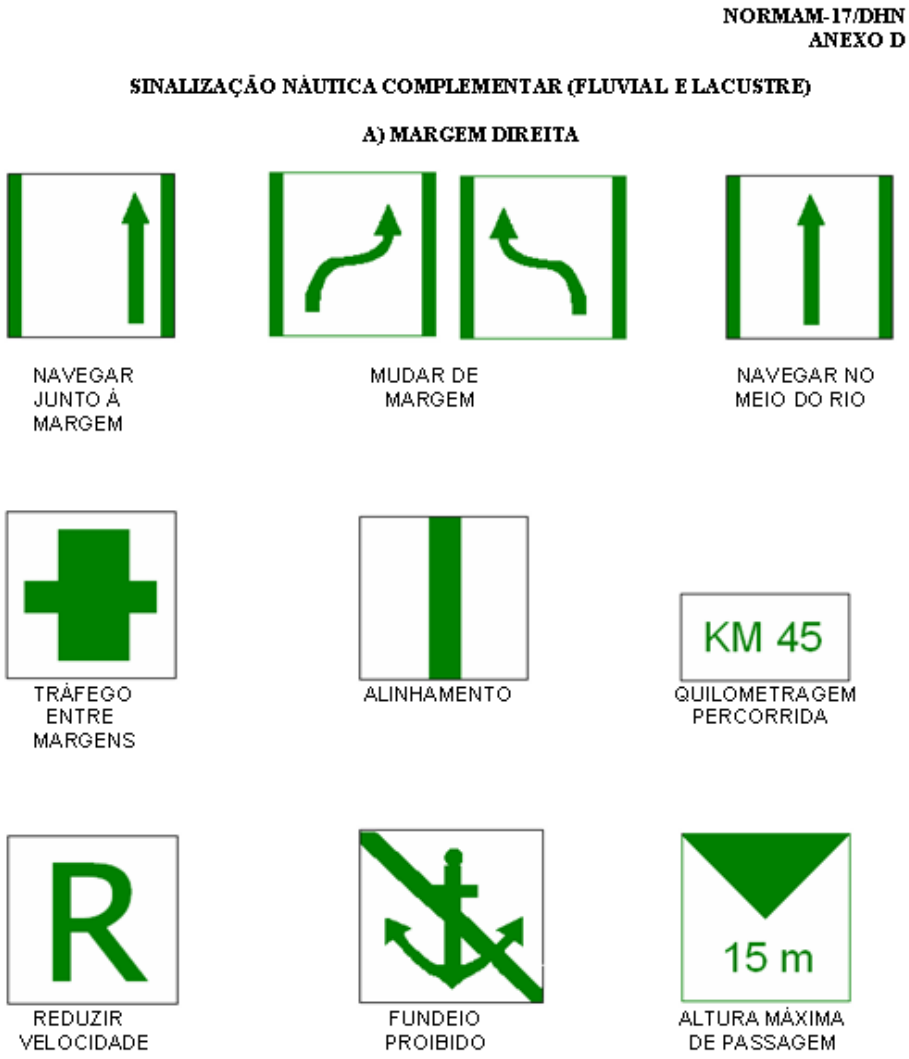
To issue authorization for establishing, modifying or permanently cancelling any aid to navigation as well as **defining appropriate guidelines for aids to navigation**.

Exceptions: small buoyage systems for restricted use (like those for exclusive use of fishermen colonies), marking of security perimeters of hydroelectric plants, marking of dredging areas and dredging disposal areas, all of those ascribed to the Local Port Authorities.”

NORMAM-17 – BRASIL

Complementary notice marks (1)

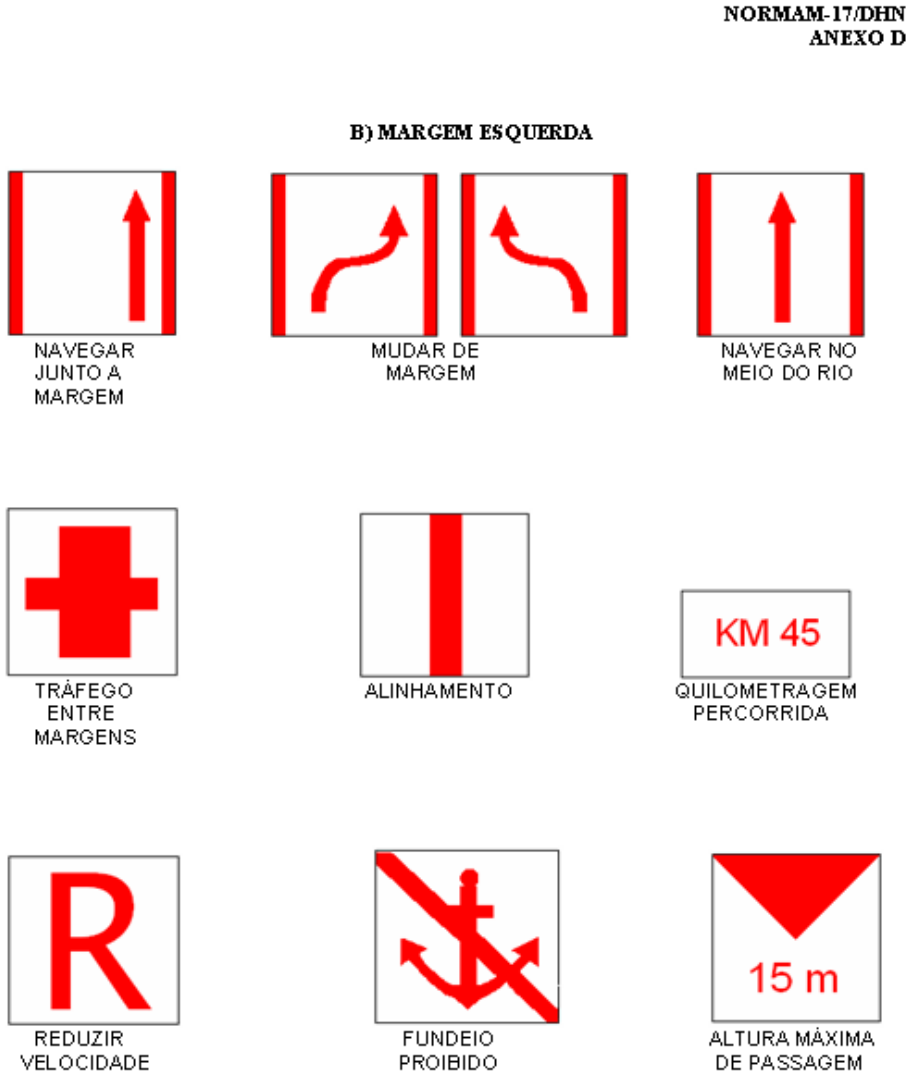
(RIGHT MARGIN)



NORMAM-17 – BRASIL

Complementary notice marks (2)

(LEFT MARGIN)



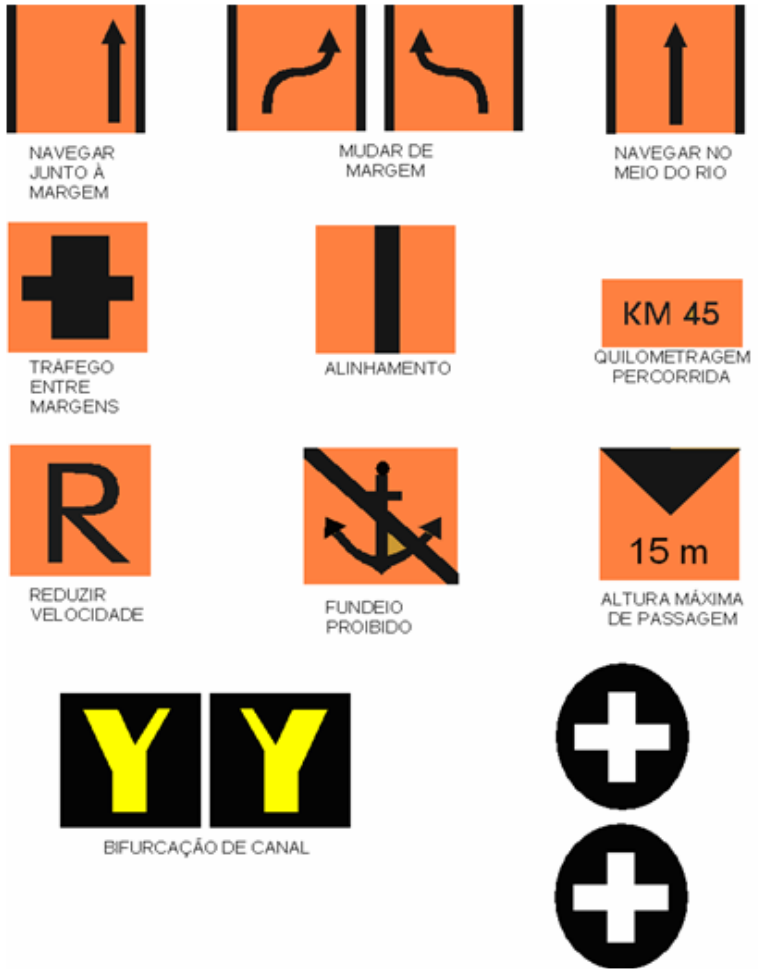
NORMAM-17 – BRASIL

Complementary notice marks (3)

NORMAM-17/DHN
ANEXO D

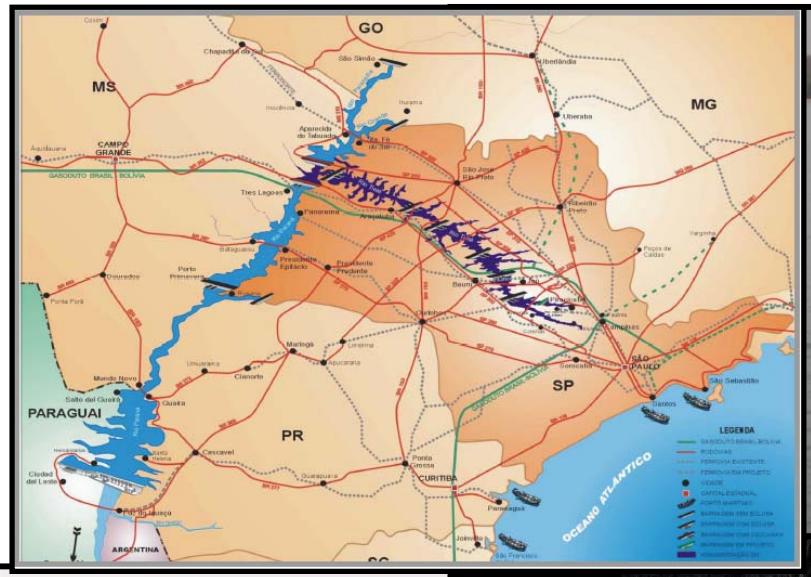
(BOTH MARGINS)

C) INDEPENDENTE DA MARGEM

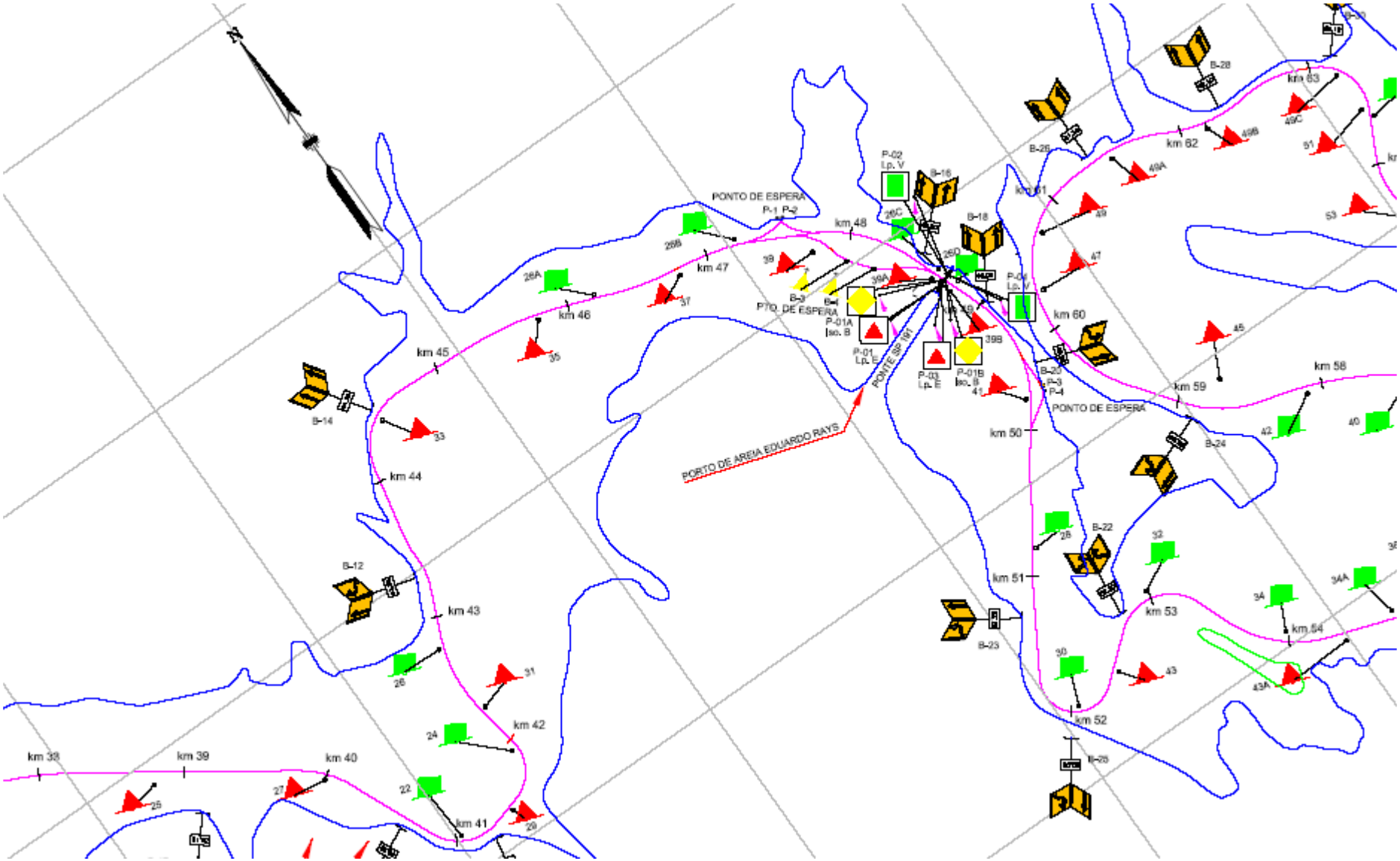


Brazilian Waterway Administrations

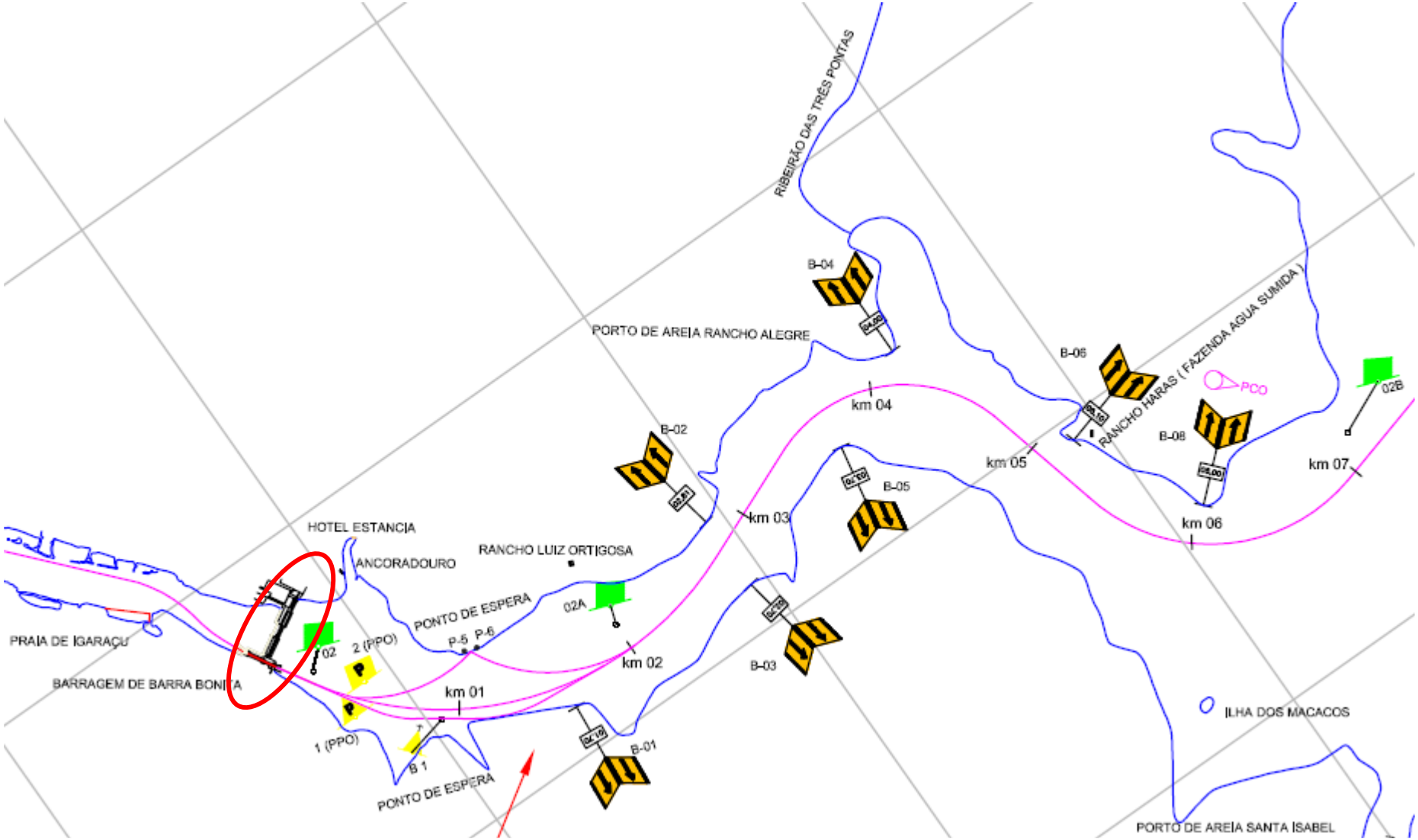
Tietê-Paraná Waterway Marks



Tietê River


N
PONTO DE ESPERA
P-1 P-2
km 48
km 47
km 46
km 45
km 44
km 43
km 42
km 41
km 40
km 39
km 38
km 50
km 51
km 52
km 53
km 54
km 59
km 60
km 62
km 63
PTO. DE ESPERA
P-01A
P-01
P-01B
P-02
P-03
P-04
PONTE SP 191
PORTO DE AREIA EDUARDO RAYS
B-12
B-14
B-16
B-18
B-20
B-22
B-23
B-24
B-26
B-28

Tietê River – Barra Bonita Dam



Paraguay-Paraná Waterway

Paraguay-Paraná Waterway

International Waterway (5 countries):

Brasil

- **Bolívia**
- **Paraguay**
- **Argentina**
- **Uruguay**

BRAZILIAN NAVY:

- Produces charts from Cáceres to Asunción;

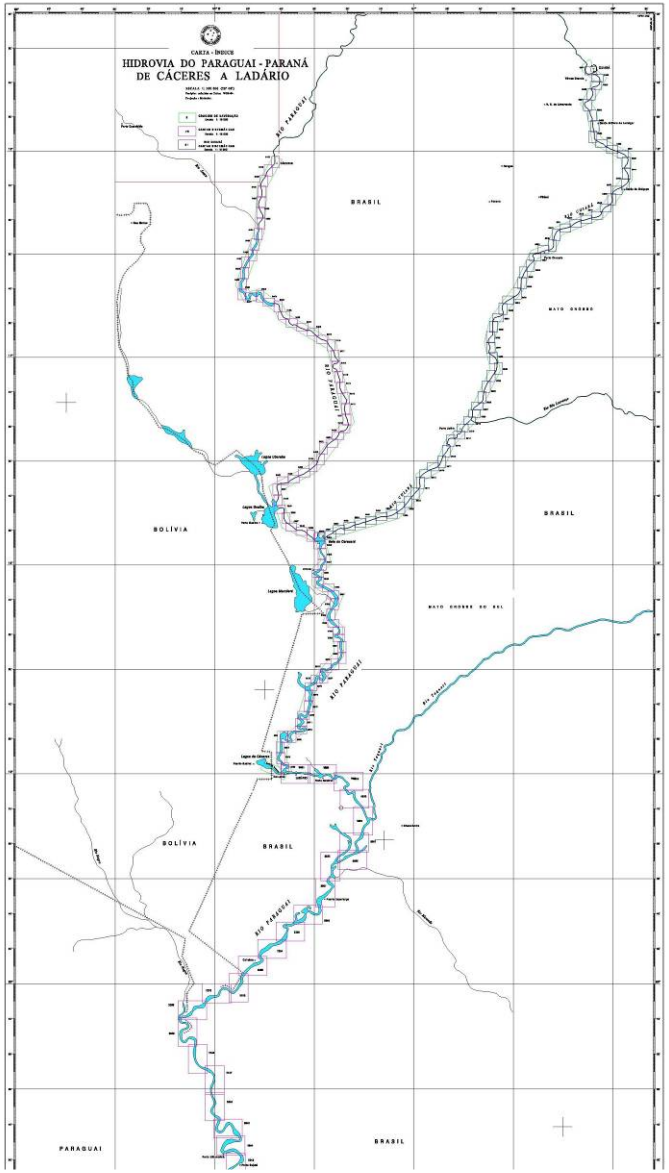
- Mantain navigational aids from Cáceres to Apa River mouth (Brasil – Bolívia part)

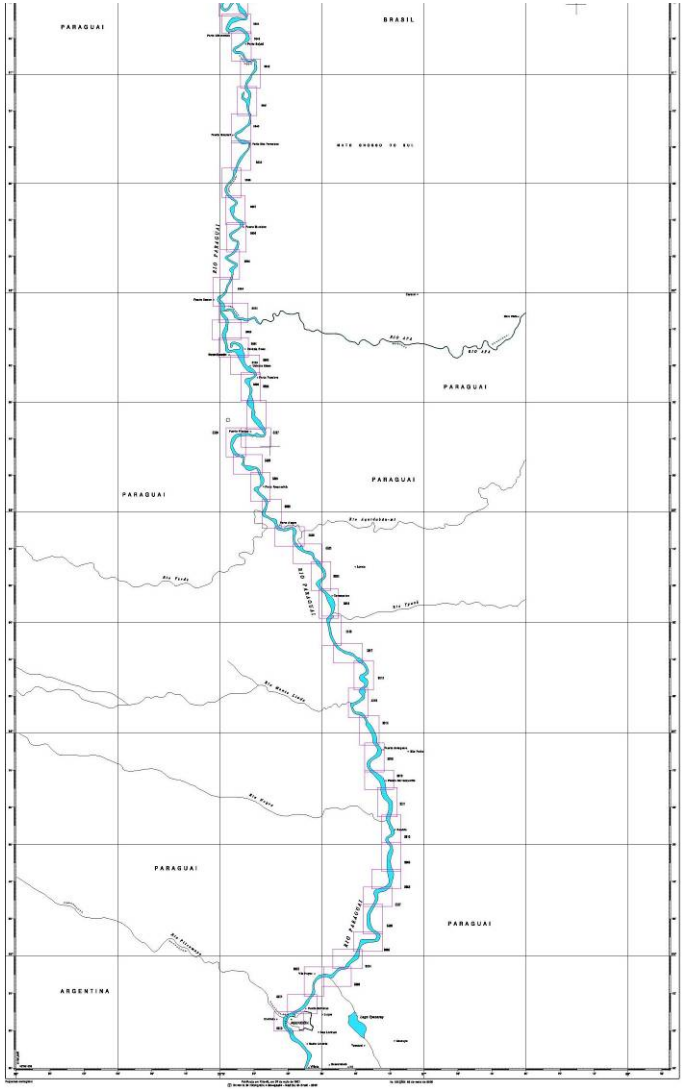
Brazilian Cartographic Plan – Paraguay River
From Cáceres to Asunción

1890 Km

143 Charts (A2)

10000/25000



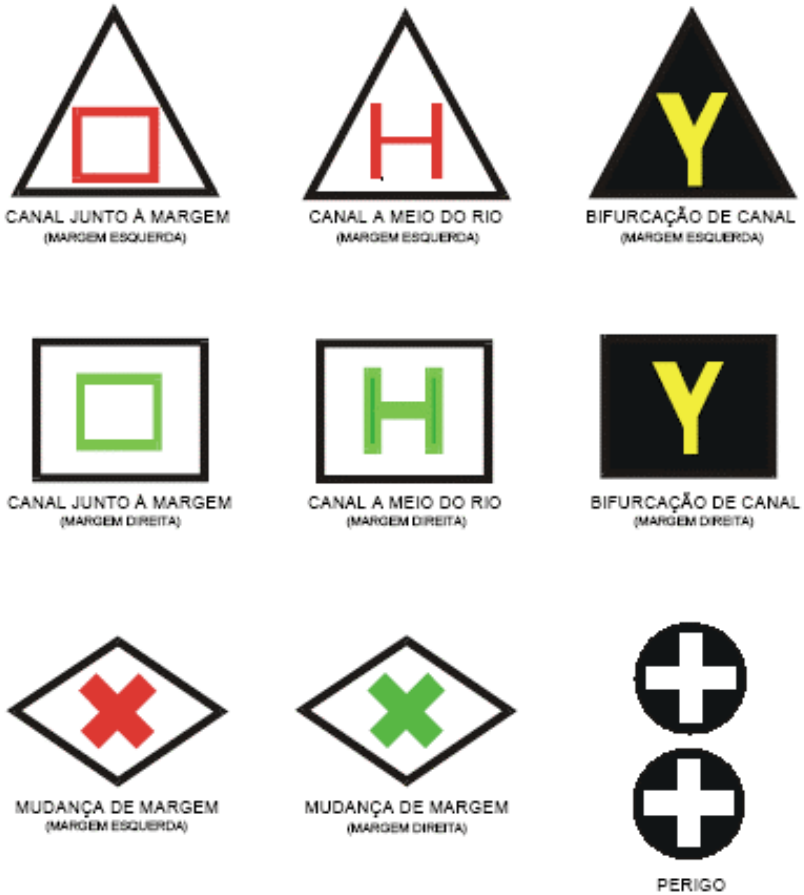


NORMAM-17 – BRASIL

From Cáceres to Apa River mouth

NORMAM-17/DHN

SINALIZAÇÃO NÁUTICA COMPLEMENTAR
(Hidrovia Paraguai – Paraná)



LEFT MARGIN

RIGHT MARGIN

PARAGUAY RIVER - Brazilian Aids

Left margin

PARAGUAY RIVER - Brazilian Aids

Right margin

PARAGUAY RIVER - Brazilian Aids

Isolated Danger

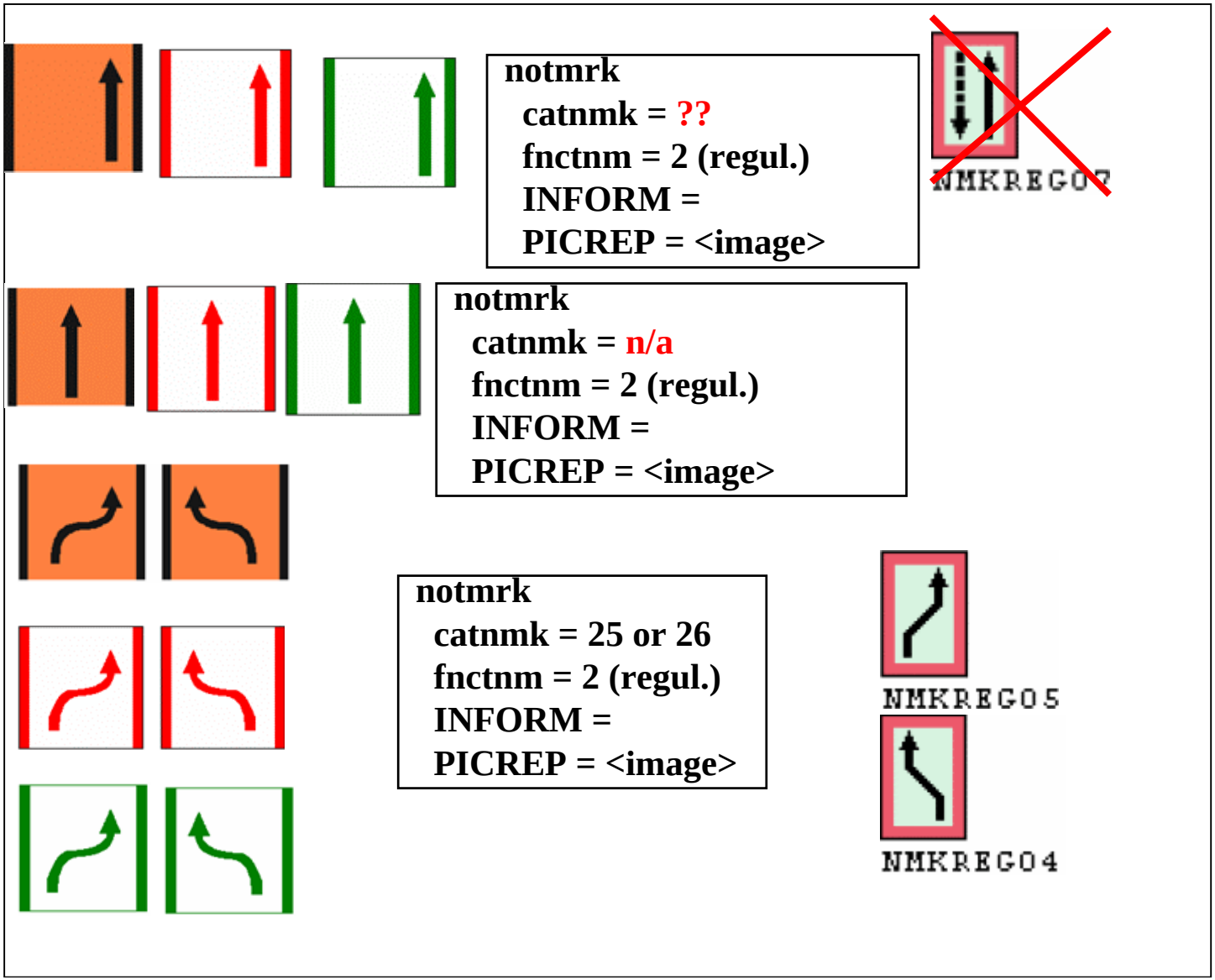
ANNP – PARAGUAY

From Apa River mouth to Parana River confluence

Encoding Trials using Product Specifications for Inland ENCs version 2.1

- **Brazilian National Waterways Regulations**

Prod Spec for Inland ENCs 2.1
Pres Lib for Inland ECDIS 2.1



Prod Spec for Inland ENCs 2.1
Pres Lib for Inland ECDIS 2.1

notmrk
catnmk = 76 or 77
fnctnm = 5 (info.)
INFORM =
PICREP = <image>

NMKINF24

NMKINF25

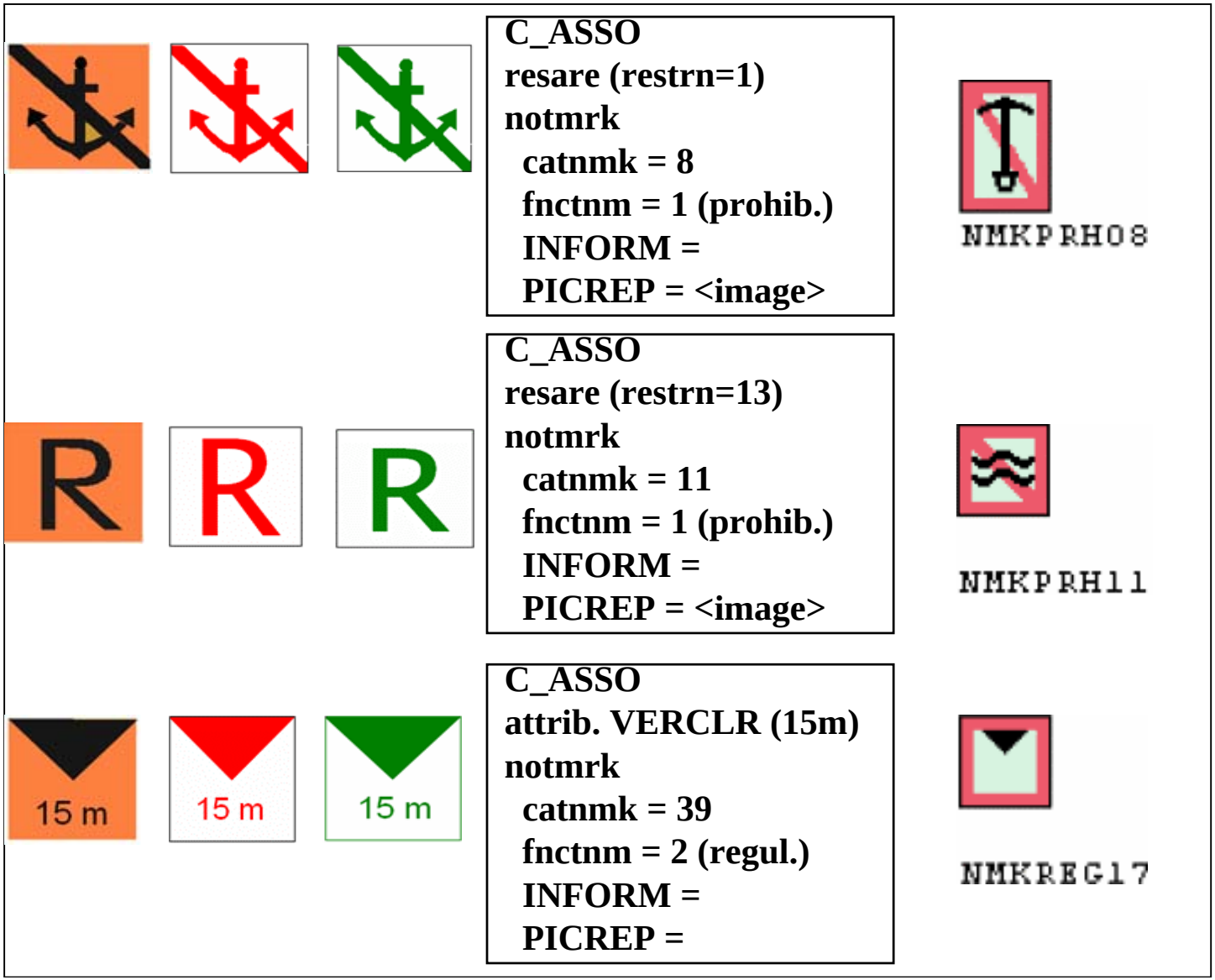
C_AGGR
NAVLNE
CATNAV = 3
ORIENT = xx

notmrk
catnmk = n/a
fnctnm = 2 (regul.)
INFORM =
PICREP = <image>

C_ASSO
CTNARE
INFORM = “crossing traffic”
notmrk
catnmk = 75
fnctnm = 5 (info.)
INFORM =
PICREP =

NMKINF23

Prod Spec for Inland ENCs 2.1
Pres Lib for Inland ECDIS 2.1

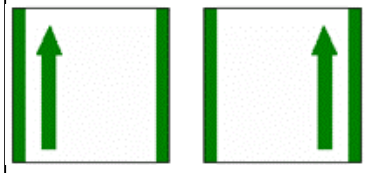


Alternative trials with amendments to Product Specifications for Inland ENCs version 2.1

- Brazilian National Waterways Regulations
- Paraguay-Paraná Waterway Regulations

Brazilian National Waterways

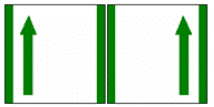
DHN trial (part 1)

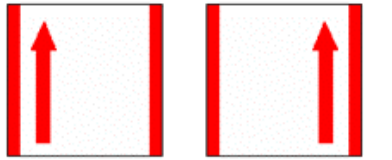


keep right margin

bcnlat (master)
BCNSHP = 1
catlam = 11
(chan. near right bank)
COLOUR =

daymar (slave)
TOPSHP = 19
COLOUR = 1,4
sympat = xx,xx
marsys = yy
ORIENT =
INFORM =
PICREP = <image>

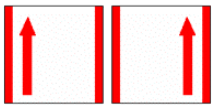




keep left margin

bcnlat (master)
BCNSHP = 1
catlam = 12
(chan. near left bank)
COLOUR =

daymar (slave)
TOPSHP = 19
COLOUR = 1,3
sympat = xx,xx
marsys = yy
ORIENT =
INFORM =
PICREP = <image>

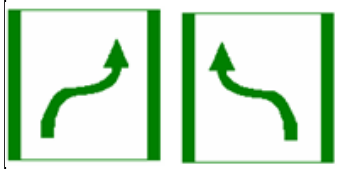


bcnlat (master)
BCNSHP = 1
catlam = 11 or 12
COLOUR =

daymar (slave)
TOPSHP = 19
COLOUR = 11,2
sympat = xx,xx
marsys = yy
ORIENT =
INFORM =
PICREP = <image>

Brazilian National Waterways

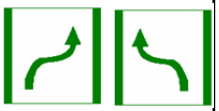
DHN trial (part 2)

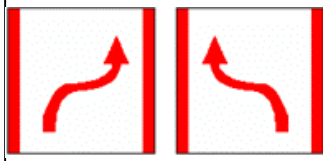


upstream downstream

bcnlat (master)
BCNSHP = 1
catlam = 14
(chan. cross-over to the left bank)
COLOUR =

daymar (slave)
TOPSHP = 19
COLOUR = 1,4
sympat = xx,xx
marsys = yy
ORIENT =
INFORM =
PICREP = <image>

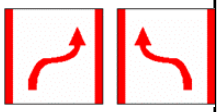




downstream upstream

bcnlat (master)
BCNSHP = 1
catlam = 13
(chan. cross-over to the right bank)
COLOUR =

daymar (slave)
TOPSHP = 19
COLOUR = 1,3
sympat = xx,xx
marsys = yy
ORIENT =
INFORM =
PICREP = <image>

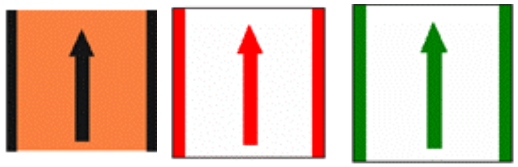


bcnlat (master)
BCNSHP = 1
catlam = 13 or 14
COLOUR =

daymar (slave)
TOPSHP = 19
COLOUR = 11,2
sympat = xx,xx
marsys = yy
ORIENT =
INFORM =
PICREP = <image>

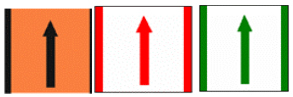
Brazilian National Waterways

DHN trial (part 3)

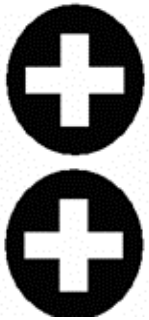


bcnlat (master)
BCNSHP = 1
catlam = xx (channel in the center of the river)
COLOUR =

daymar (slave)
TOPSHP = 19
COLOUR = (11,2) (1,3) (1,4)
sympat = xx, xx, xx
marsys = yy
ORIENT =
INFORM =
PICREP = <image>



dismar
CATDIS = 3
hunits = 3
wtwdis = 45



BCNISD (master)
BCNSHP = 1
COLOUR = 2,3,2
COLPAT = 1
TOPMAR (slave)
TOPSHP = 4 (2 spheres)
COLOUR = 2
INFORM = “white crosses”

Brazilian National Waterways

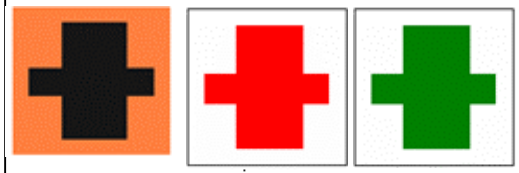
DHN trial (part 4)

BCNSPP (master)
BCNSHP = 1
CATSPM = 54
COLOUR =

daymar (slave)
TOPSHP = 19
COLOUR = 2,6
sympat = xx
marsys = yy
INFORM =
PICREP = <image>

C_ASSO
NAVLNE
CATNAV = 3
ORIENT = xxx
BCNSPP (master)
BCNSHP = 1
CATSPM = 16
COLOUR =

daymar (slave)
TOPSHP = 19
COLOUR = x,x
sympat =
marsys = yy
INFORM =
PICREP = <image>

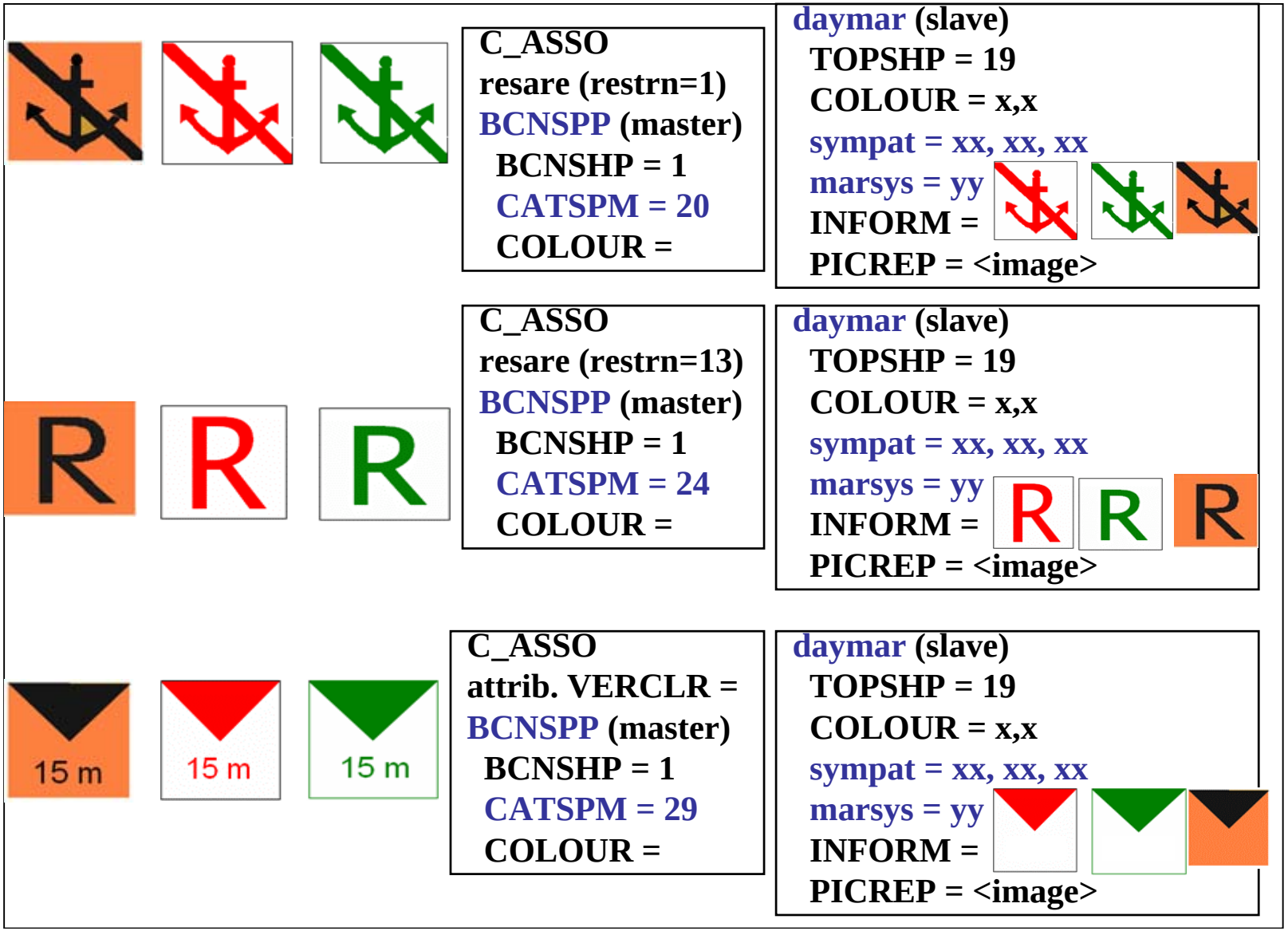


C_ASSO
CTNARE
INFORM = “ “
BCNSPP (master)
BCNSHP = 1
CATSPM = 37
COLOUR =

daymar (slave)
TOPSHP = 19
COLOUR = x,x
sympat =
marsys = yy
INFORM =
PICREP = <image>

Brazilian National Waterways

DHN trial (part 5)



Summary (1)

Amendments to IENC Product Spec. 2.1

- **New feature daymar replacing DAYMAR and including following attributes:**
  - **sympat –** create values for (3 colors each – green, red and orange)
    - “right-side arrow”
    - “left-side arrow”
    - “cross to right-side arrow”
    - “cross to left-side arrow”
    - “center arrow”
    - “Y-shape”
    - “vertical line”
    - “perpendicular lines”
    - “no anchoring”
    - “reduce wake”
    - “restricted vertical clearance”
  - ORIENT
  - **marsys -** create value for:
    - “Brazilian inland waterway regulations”
  - **catlam** – create value for:
    - “channel in the center of the river”

Summary (2)

Amendments to IENC Product Spec. 2.1

- **Include HYDRO features:**
  - **BCNISD**
  - **BOYISD**
  - **BCNSPP**
- **Include following CATSPM attribute values (HYDRO):**
  - CATSPM = 16 “leading mark”
  - CATSPM = 20 “anchoring prohibited mark”
  - CATSPM = 24 “reduced wake mark”
  - CATSPM = 26 “stop mark”
  - CATSPM = 29 “restricted vertical clearance mark”
- **Include following BCNSHP attribute values (HYDRO):**
  - BCNSHP = “1,2,3,4,5,6,7” replacing “1,5”

Summary (3)

Amendments to IENC Product Spec. 2.1

- **Data set naming –** include possibility of

  CCPRRRRR.EEE where:

  CC = Country code

  P = Usage

  RRRRR = alfa-numeric equivalent paper chart number

  EEE = update number

Paraguay-Paraná Waterway

DHN trial (part 1)

keep right margin

bcnlat (master)
BCNSHP = 1
catlam = 11
(chan. near right bank)
COLOUR =

daymar (slave)
TOPSHP = 19
COLOUR = 1,4
sympat = xx
marsys = zz
ORIENT =
INFORM =
PICREP = <image>

keep left margin

bcnlat (master)
BCNSHP = 1
catlam = 12
(chan. near left bank)
COLOUR =

daymar (slave)
TOPSHP = 24
COLOUR = 1,3
sympat = xx
marsys = zz
ORIENT =
INFORM =
PICREP = <image>

left margin

right margin

BCNSPP (master)
BCNSHP = 1
CATSPM = 54
COLOUR =

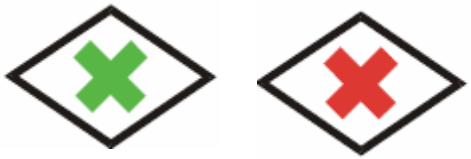
daymar (slave)
TOPSHP = 24 or 19
COLOUR = 2,6
sympat = xx, xx
marsys = zz
INFORM =
PICREP = <image>

Paraguay-Paraná Waterway

DHN trial (part 2)

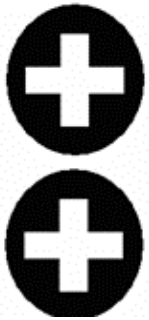
bcnlat (master)
BCNSHP = 1
catlam = xx (channel in the center of the river)
COLOUR =

daymar (slave)
TOPSHP = 19 or 24
COLOUR = (1,4) or (1,3)
sympat = xx, xx
marsys = zz
ORIENT =
INFORM =
PICREP = <image>



bcnlat (master)
BCNSHP = 1
catlam = 14 or 13 (chan. cross-over to the left bank or to the right bank)
COLOUR =

daymar (slave)
TOPSHP = 12
COLOUR = (1,4) or (1,3)
sympat = xx,xx
marsys = zz
ORIENT =
INFORM =
PICREP = <image>



BCNISD (master)
BCNSHP = 1
COLOUR = 2,3,2
COLPAT = 1

TOPMAR (slave)
TOPSHP = 4 (2 spheres)
COLOUR = 2
INFORM = “white crosses”

Summary

Amendments to IENC Product Spec. 2.1

- **New feature daymar replacing DAYMAR and including following attributes, besides :**
  - **sympat –** create values for
    - ““red square on triangle”
    - “green square on rectangle”
    - “red H-shape on triangle”
    - “green H-shape on rectangle”
    - “red X-shape on rhombus”
    - “green X-shape on rhombus”
  - **marsys -** create value for:
    - “Paraguay-Parana inland waterway regulations”

Thanks...

Contact:
Lt.Cdr. Flávia Mandarino
Brazilian Navy Hydrographic Centre
Division of Cartography
e-mail: flavia@chm.mar.mil.br
tel.: +55 21 2189 3084