China IENC Development Status

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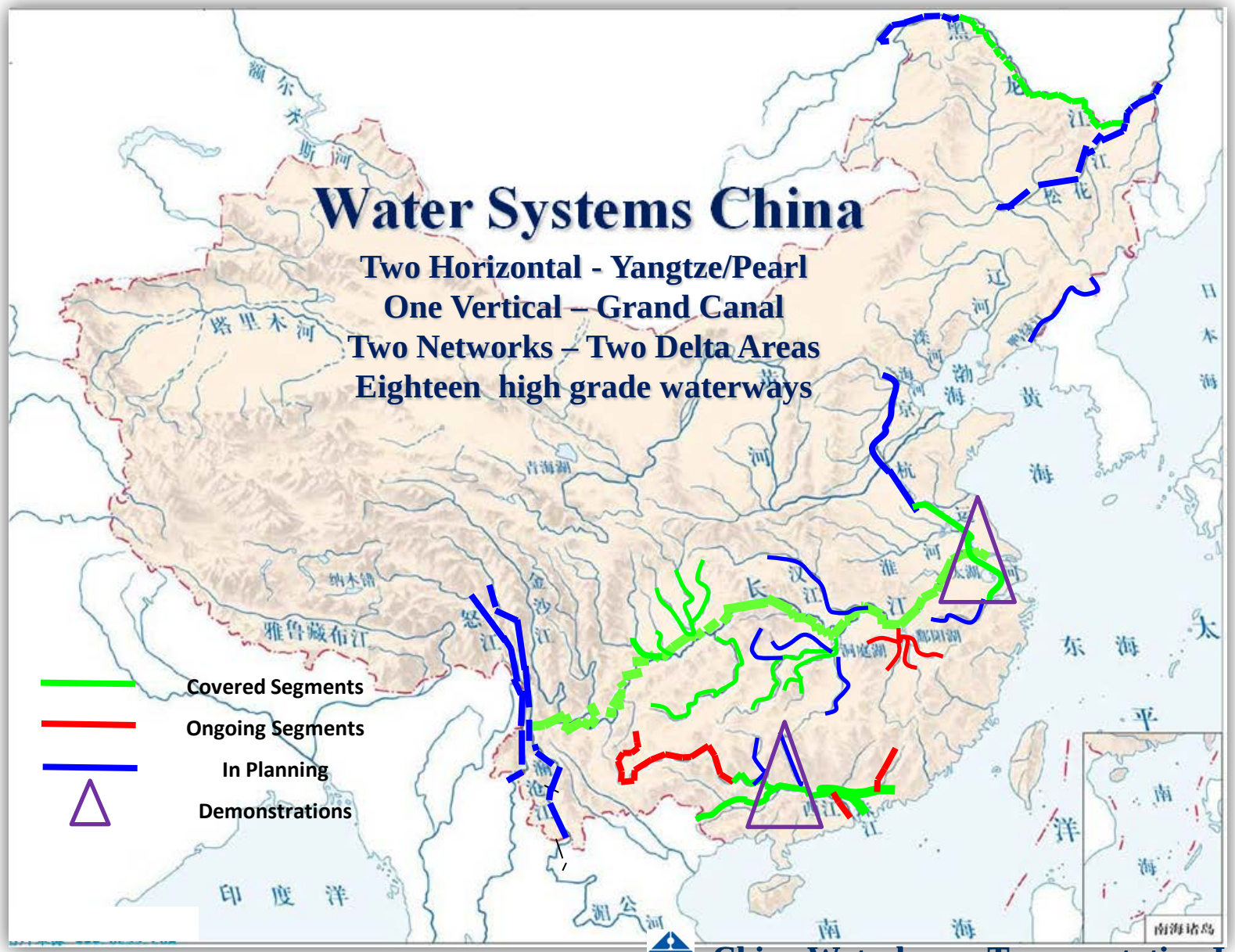
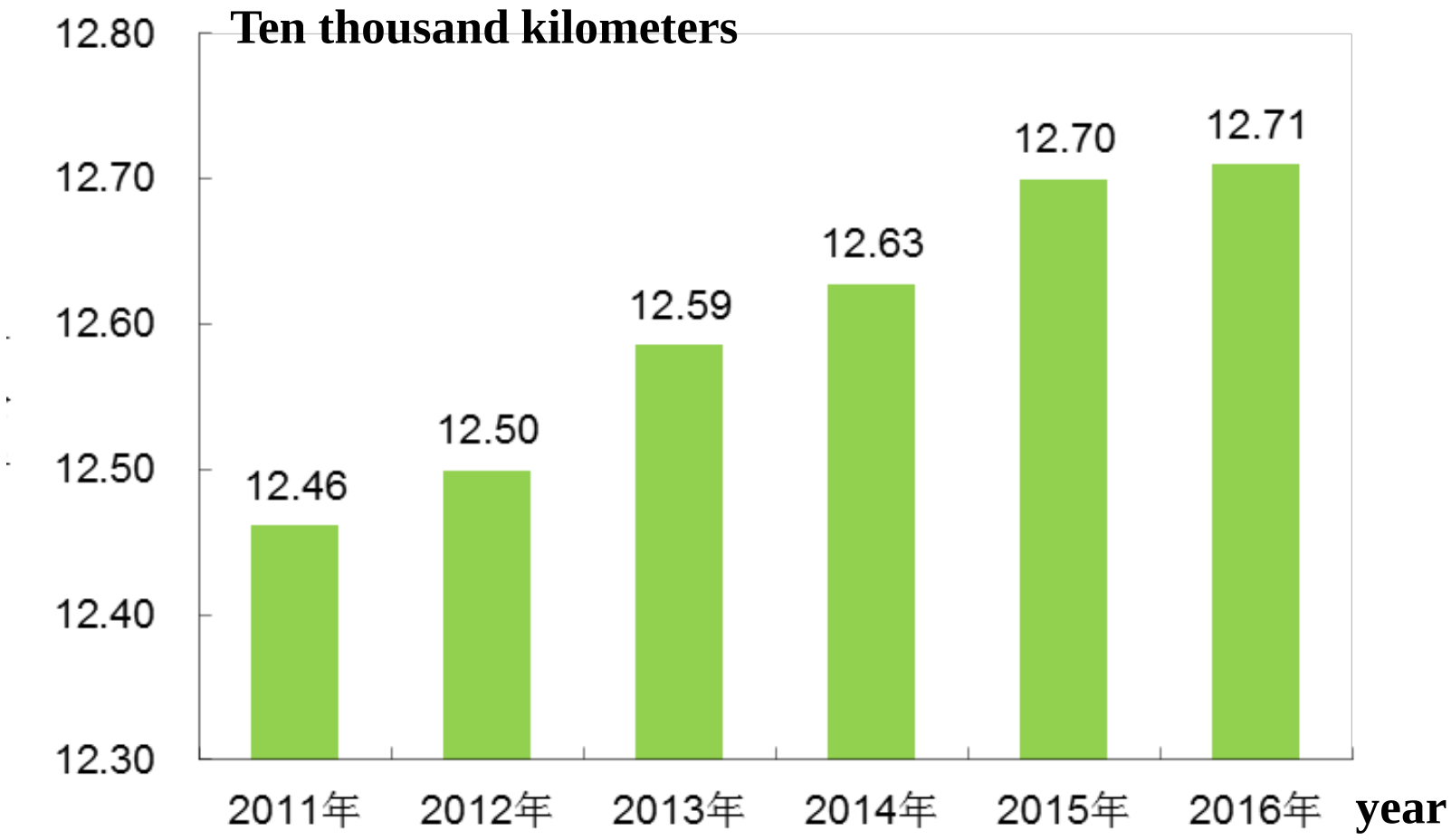
China Inland Waterway Development Status



China Inland Waterway Development Status

Navigable inland waterways



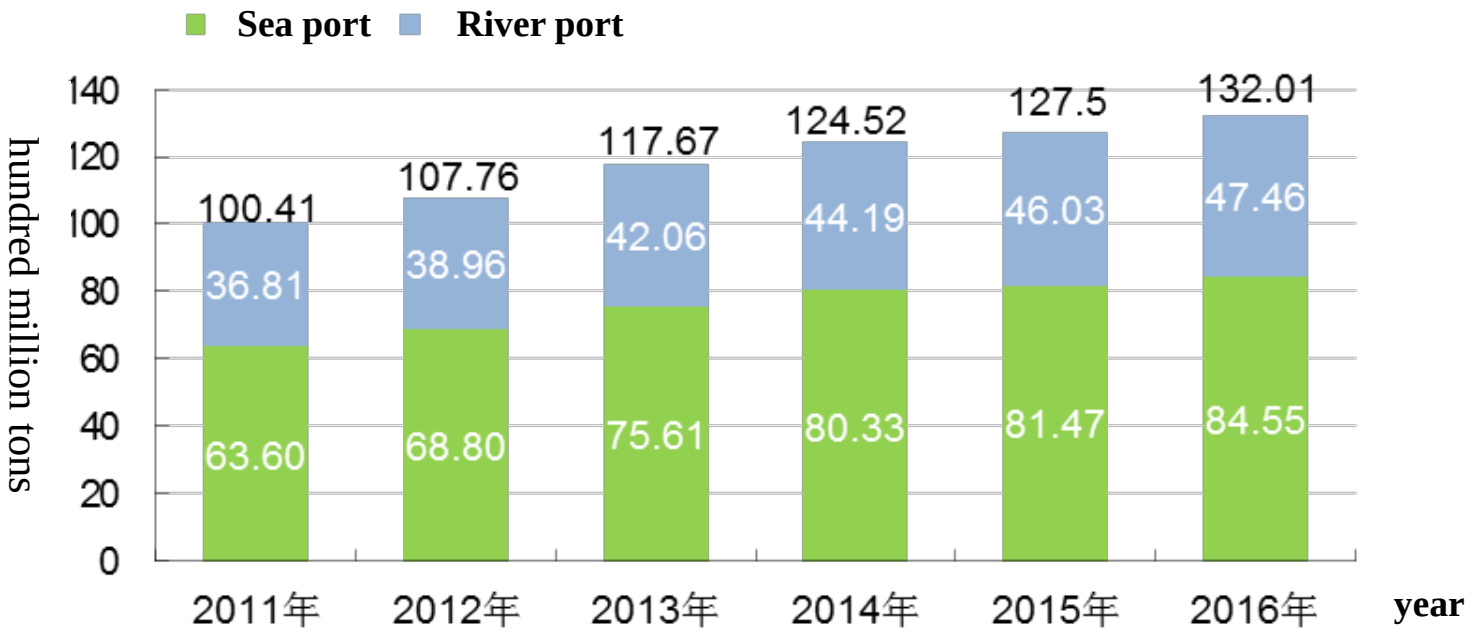
Inland Vessels

147.2 thousand vessels with 133.61 million DWT in 2016

774.4 thousand passengers in 2016

297 thousand TEU container of inland river in 2016

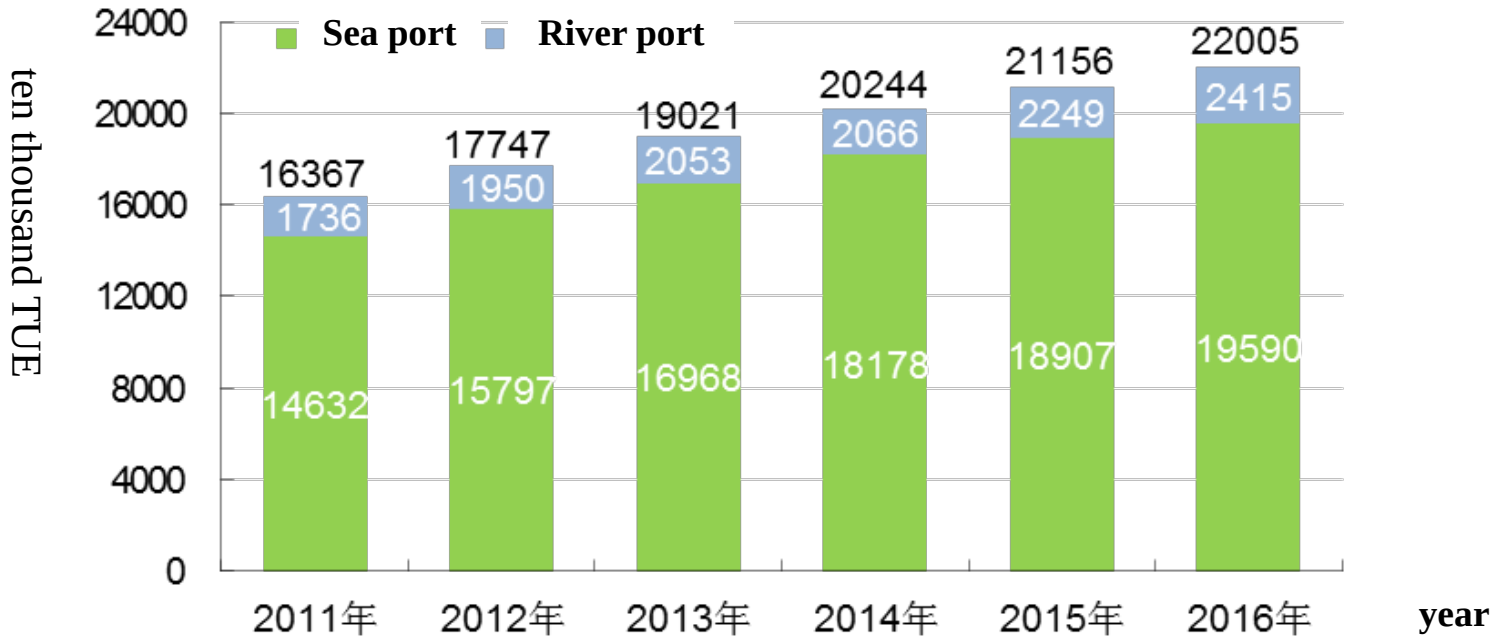
Port Cargo Throughput



13.2 billion tons port's cargo throughput in 2016, up 3.5% from the previous year.

- **Sea port: 8.5 billion tons with a 3.8% increase over last year.**
- **River port: 4.4 billion tons with a 3.1% increase over last year.**

Container Throughput

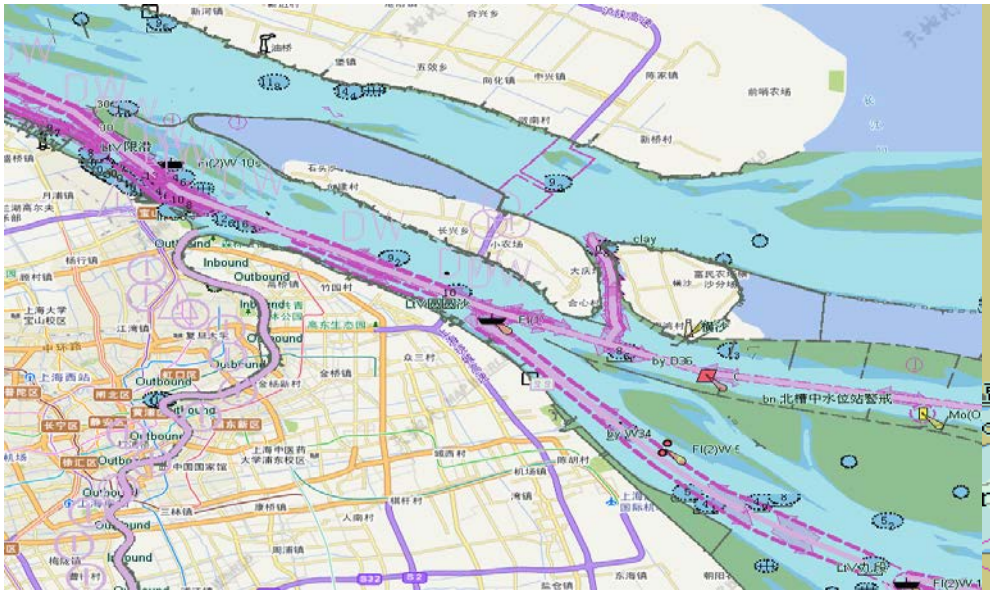


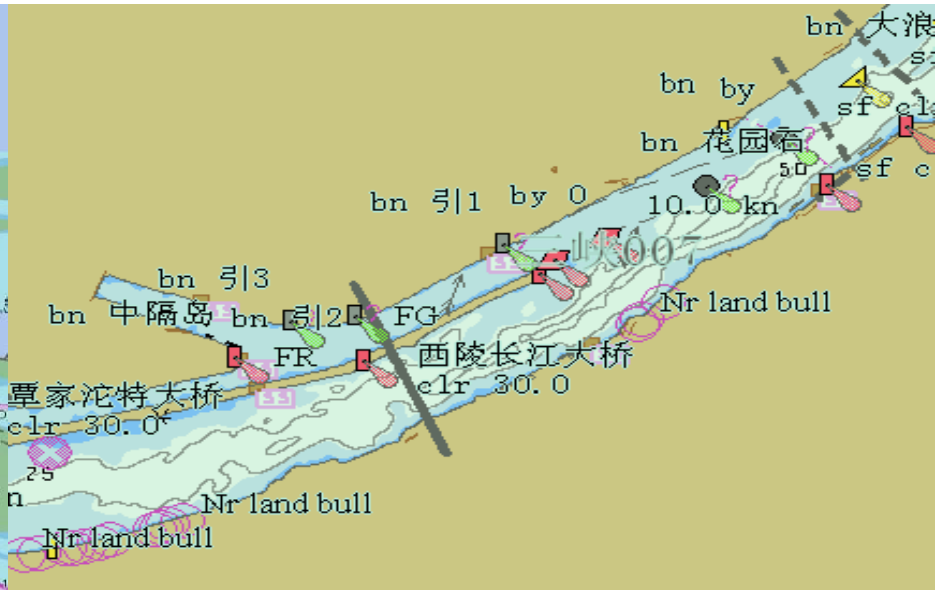
220 million TEU container throughput in 2016, up 4.0% from the previous year.

- **Sea port: 196 million TEU with a 3.6% increase over last year**
- **River port: 2.42 million tons with a 7.4% increase over last year**

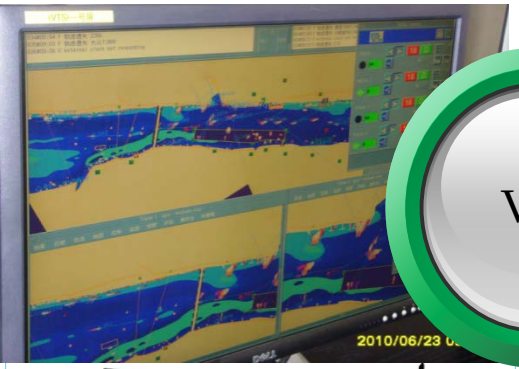
IENC Standardization and Application

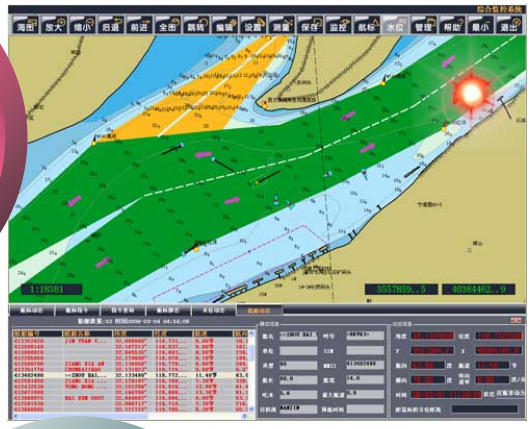
- **Inland Waterway Electronic Chart：**
  - **IENC map with S-57 or IENC standard**
  - **GIS map with GIS standard**
    - **Land/water Integration Map**

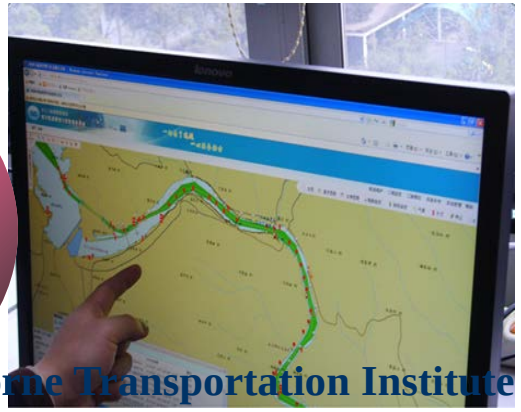




IENC Standardization and Application







IENC Applications

- AIS
- Remote Monitor and Control System for AtoNs
- VTS
- Remote Monitor and Report System for Water Level
- ECS
- Digital Waterway Mantainance System

National IENC Standard Content

National standard draft has been completed：

- **National Standards — IENC Engineering Technical Standard**
  - ✓ **Team Leader: Fei Weijun**
  - ✓ **Principle： Combined with China’s Reality, Compatible with the IEHG IENC standard**
  - ✓ **Structure: 8 Parts and 3 Appendixes**

Standard Structure

National Standards:

1. General Issues
2. Terms
3. Basic Rules
4. Feature and Attribute
5. Feature encoding
6. Data File
7. Data Structur
8. Data Checks


UDC

中华人民共和国国家标准 GB

P GB/T –

内河电子航道图工程技术标准

Engineering technical standard for inland waterway electronic chart

（draft）

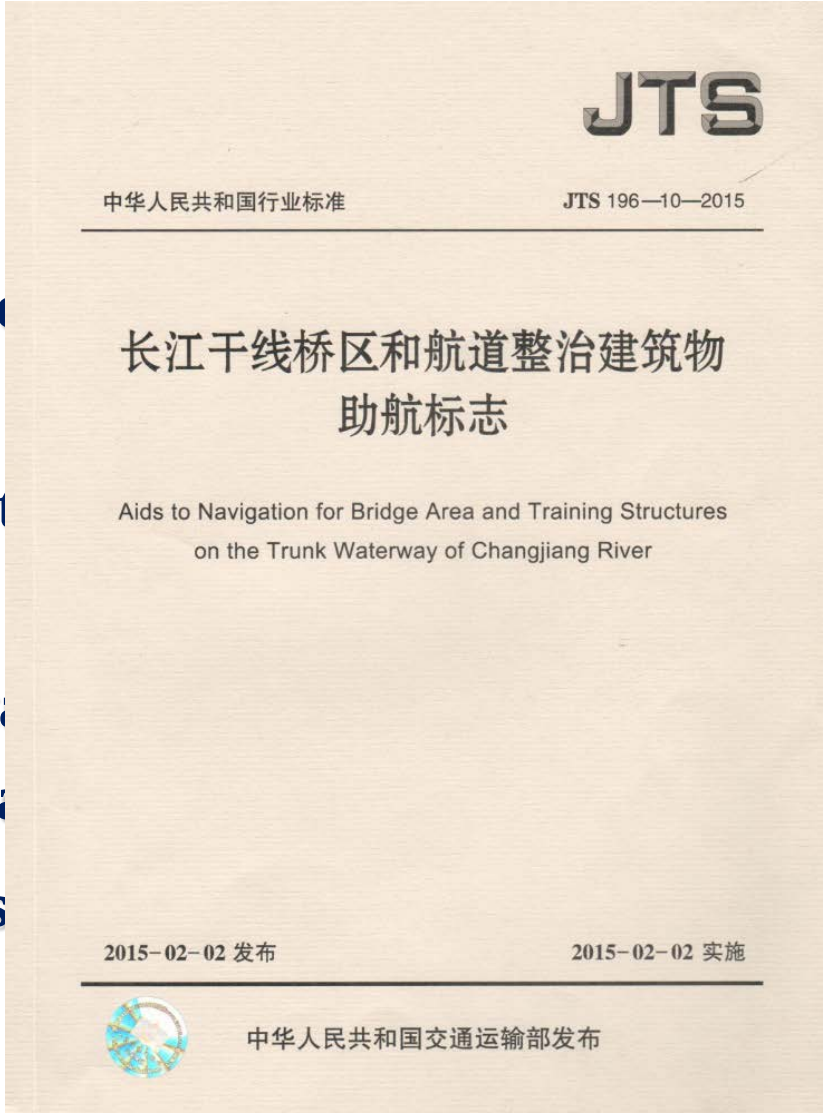
Appendix A - Feature and Attribute Catalogue

Appendix B - Feature Encoding Guide

Appendix C - Data Validation Checks

IENC Standard Difference between China and IEHG

- **Apparent difference: AtoNs**
  - **5 classifications, 25 kinds**
    - ✓ **Navigation Marks: indicat limits and obstructions**
    - ✓ **Signal Marks : provide wa vessels**
    - ✓ **Special Marks : indicate st sections, etc., not for navig**
    - ✓ **Indication Marks : notice s**
    - ✓ **Warning Marks : warning**


JTS

中华人民共和国行业标准 JTS 196—10—2015

长江干线桥区和航道整治建筑物助航标志

Aids to Navigation for Bridge Area and Training Structures on the Trunk Waterway of Changjiang River

2015-02-02 发布 2015-02-02 实施

中华人民共和国交通运输部发布

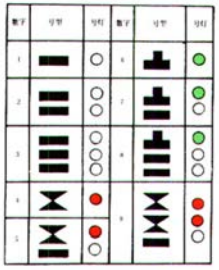
IENC Standard Difference between China and IEHG

Classifications	No.	AtoNs	IEHG/ S-57 Object & Attribute
1. Navigation Marks (11)	1	Crossing Mark 	bcnlat/boylat, catlam=13/14
	2	Bankwise Mark 	bcnlat/boylat, catlam=27
	3	Range Marks	BCNSPP/BOYSPP-CATSPM 16, leading mark
	4	Transition Range Marks 	
	5	Indirect Range Marks	
	6	Fore and Aft Range Marks	

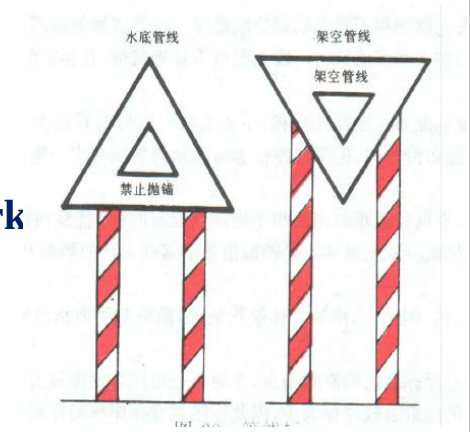
IENC Standard Difference between China and IEHG

Classifications	No.	AtoNs	IEHG/ S-57 Object & Attribute
1. Navigation Marks (11)	7	Lateral Mark 	BOYLAT/BCNLAT-CATLAM=1/2
	8	Middle Ground Mark/ Bifurcation Mark 	bcnlat/boylat catlam=9/10
	9	Position Indicating Mark 	
	10	Flood Mark 	
	11	Bridge Opening Mark 	notmrk，catnmk= 44/45 或 bcnlat，catlam=23

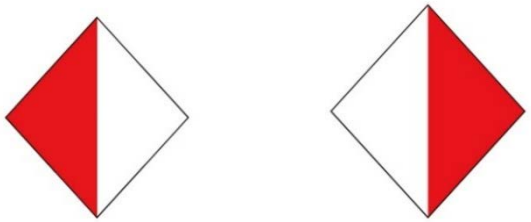
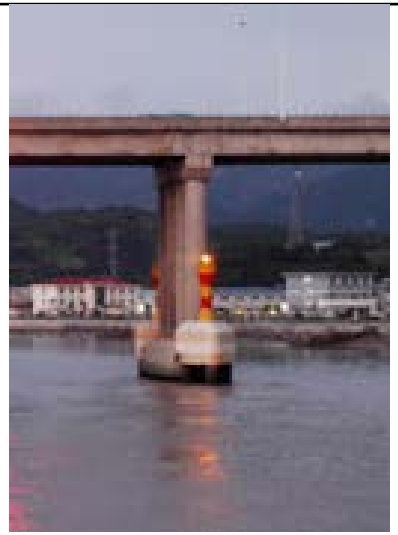
IENC Standard Difference between China and IEHG

Classifications	No.	AtoNs	IEHG/ S-57 Object & Attribute
2 Signal Marks (6)	1	Traffic Control Mark 	
	2	Whistling Mark 	BCNSPP/BOYSPP-CATSPM =28, ‘sound ship’s siren mark
	3	Limit Mark 	notmrk， catnmk= 31
	4	Depth Signal Mark  	
	5	Cross Current Mark  	
	6	Regulating Lock Mark 	

IENC Standard Difference between China and IEHG

Classifications	No.	AtoNs	IEHG/ S-57 Object & Attribute
3 Special Marks (2)	1	Pipeline Mark 	BCNSPP/BOYSPP-CATSPM 6, cable mark; 34, overhead power cable mark; 39, pipeline mark
	2	Special Mark 	BCNSPP/BOYSPP-CATSPM

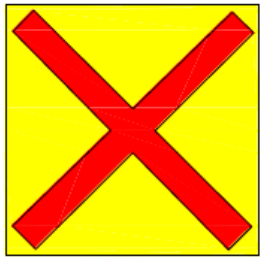
IENC Standard Difference between China and IEHG

Classifications	No.	AtoNs	IEHG/ S-57 Object & Attribute
4 Indication Marks (3)	1	Left/Right Bridge Opening Mark 	notmrk，catnmk= 12/13
	2	Pier Caps Mark 	

IENC Standard Difference between China and IEHG

Classifications	No.	AtoNs	IEHG/ S-57 Object & Attribute
4 Indication Marks (3)	3	Channel Direction Mark 	notmrk-catnmk
		Channel Mileage Mark	dismar- CATDIS
		Channel Regulating Structure Notice Mark 	
		Channel Information Notice Mark 	notmrk-catnmk=41

IENC Standard Difference between China and IEHG

Classifications	No.	AtoNs		IEHG/ S-57 Object & Attribute
5 Warning Marks (3)	1	Non-Navigable Bridge Opening Mark		
	2	Non-Navigable Waterway Topmark		
	3	Anchor Prohibited Mark		notmrk-catnmk=8
		Waterway Restricted Mark		

IENC Standard Difference between China and IEHG

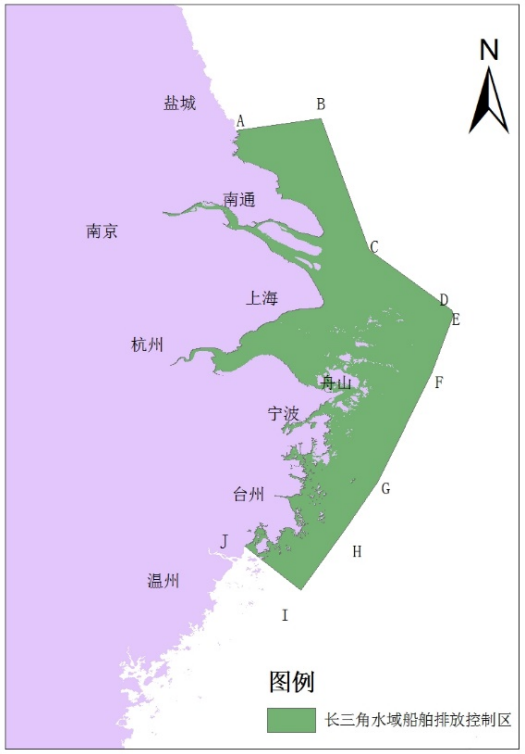
- **Summary:**
  - ✓ **A small part of Chinese AtoNs can be encoding by the features of IEHG IENC standard such as boylat/bcnlat、BCNSPP/BOYSPP，notmrk.**
  - ✓ **Most of Chinese AtoNs can't be encoding by AtoNs features of IEHG IENC**
  - ✓ **New added 8 feature classes together with Special Marks express Chinese Navigational System of Marks**

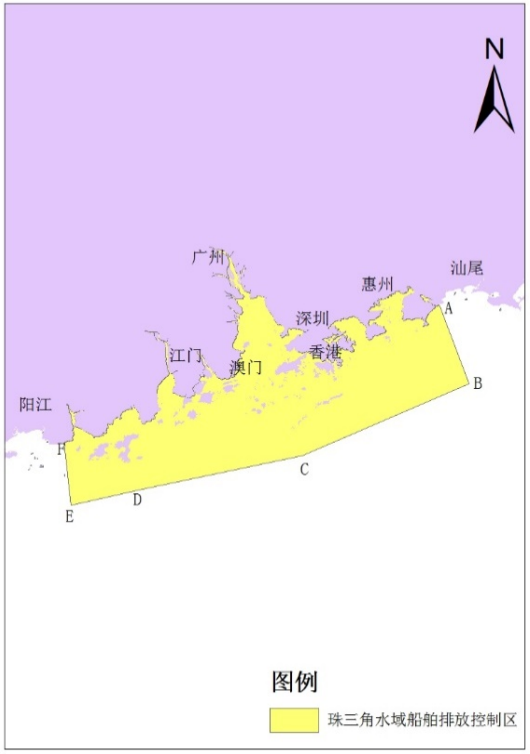
BCNNVG	**BOYNVG**
BCNSGN	**BOYSGN**
BCNSPP	**BOYSPP**
BCNIND	**BOYIND**
BCNWAR	**BOYWAR**

- **Discussion**: **How to write the Chinese Navigational System of Marks into the IEHG IENC standard?**

CR of China

- **Add new CATREA value and restrn value**
  - ✓ **new CATREA value = 29（ship pollution emission control area）**
  - ✓ **new restrn value =39（SOx emission restricted）and value=40（NOx emission restricted）**





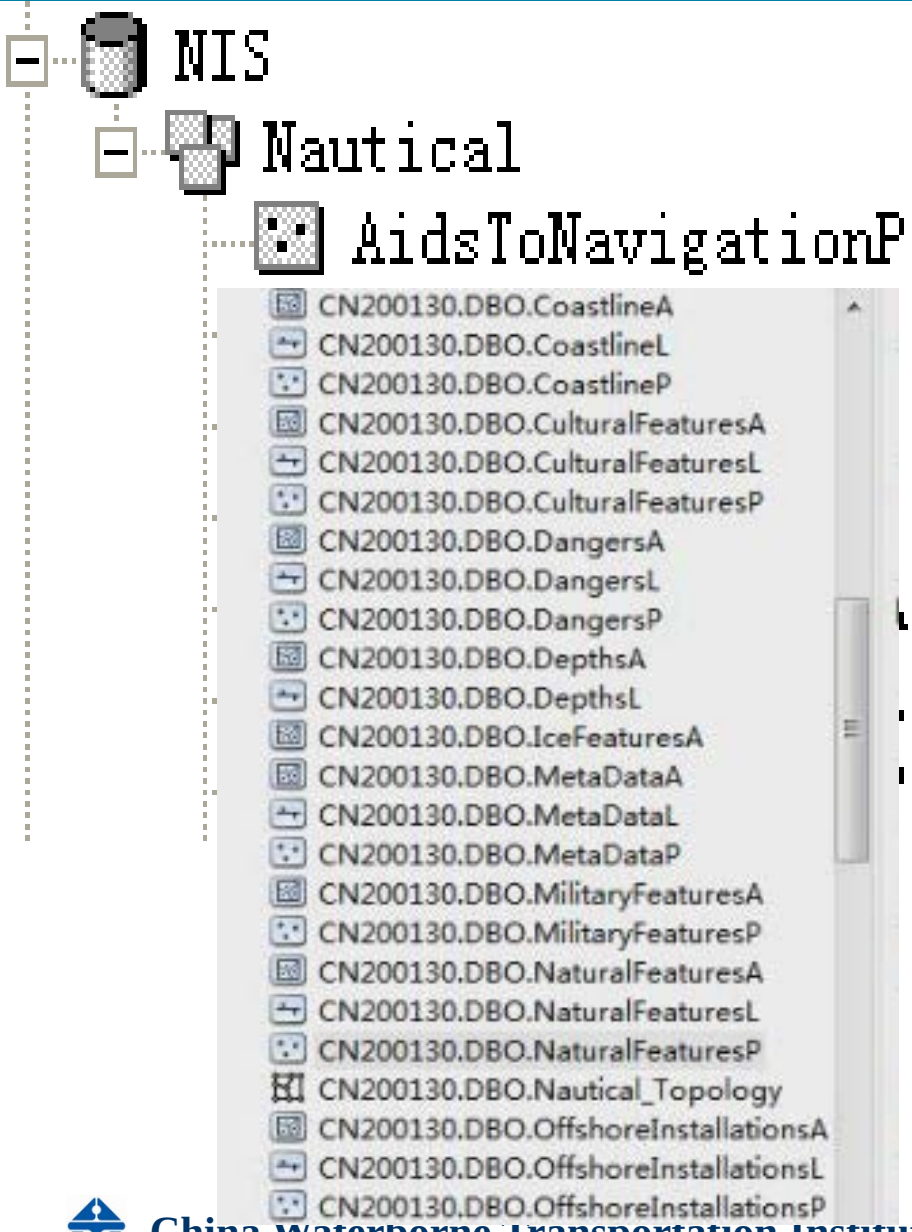
IEHG IENC Standard emendation Discussion

- **Discussion 1： about using the lower case letters or the upper case letters show the identifier of feature and attribute**

- **Suggestion: all of feature and attribute use the upper case letters**
  - ✓ **three kinds of features for IENC:**
    - **S-57 features (upper case)**
    - **Copied features are S-57 features that have been amended with inland specific attributes or enumerations (lower case)**
    - **New inland specific features (lower case).**

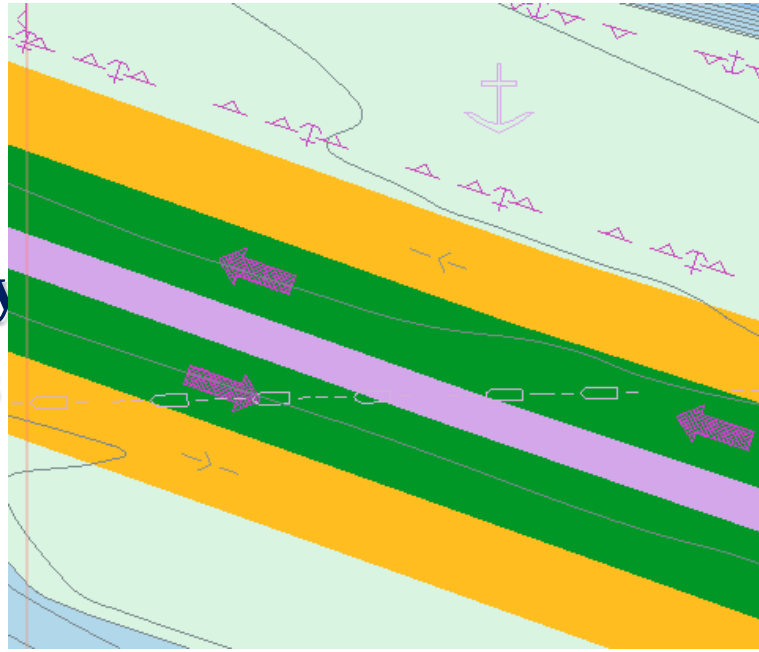
IEHG IENC Standard emendation Discussion

- Using the upper case letters cor
- In the future , it will be not pos
- S-401 will only include upper c
- Using the upper case letters car model.



IEHG IENC Standard emendation Discussion

- **Discussion 2： what are the ship routing system set up in order to furtherly promote the safety of navigation through the IENC features.**
- **It will be very useful for the more wider inland waterway.**
- **In China, the ship routing system has been initially established, including traffic separation scheme, deep water route(DWRTPT), recommended route(RCTLPT) etc.**
- **Let us including some countries to study the ship routing system， such as the rules about ship scale， ship speed, AtoNs with the correspongding features or attribute ets.**



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