



Useful and Reliable Technology for PSPC Automated Soluble Salt Measurement and Further Challenges Beyond

November 2010

 **THE SHIPBUILDERS'
ASSOCIATION OF JAPAN**

Today's Topic

- Issues for PSPC, shipbuilding industry is facing
- Countermeasures and Action
- Further Challenges Beyond for PSPC

Outline of PSPC

(Performance Standard for Protective Coatings)

- IMO Resolution MSC.215(82)
PSPC for Seawater Ballast Tank
- IMO Resolution MSC.288(87)
PSPC for Cargo Oil Tank

(Non - mandatory guideline)

- PSPC for Void space
- PSPC for PMA
- Guidelines for Maintenance and repair

Major Requirements by PSPC for SBT and COT

- Blasting for 2nd surface treatment
- Approved coating system
- Multi-coating
- 320 micron on DFT under 90/10 rule
- DFT to be measured at many points
- Edge treatment
- **Soluble Salt Measurement**
- Coating Technical File (CTF)

Soluble Salt Measurement

PSPC required:

Water soluble salts limit, equivalent to **NaCl : 50 mg/m²**

Conductivity measured (ISO 8502-9:1998)

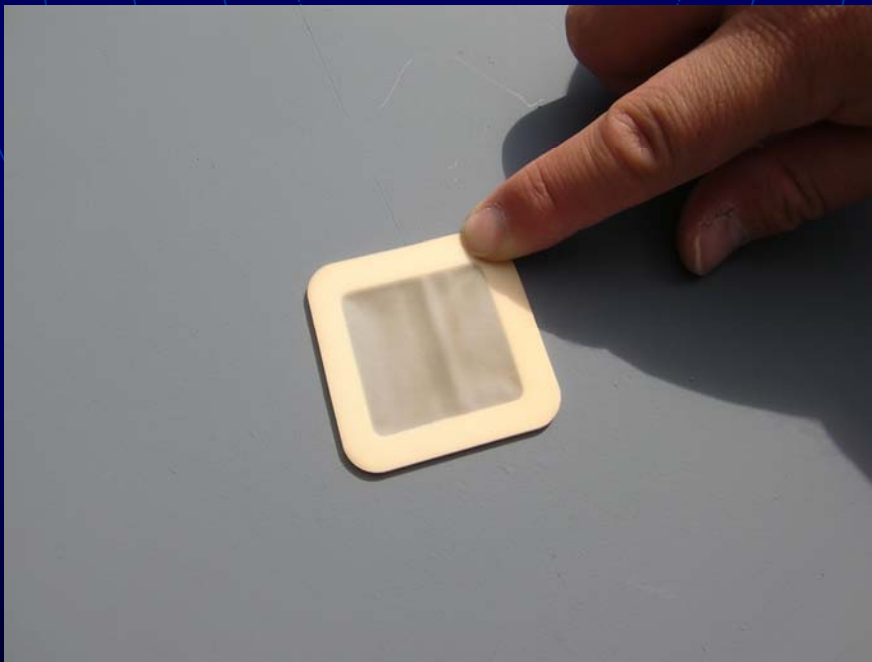


Blister

Method of Soluble Salt measurement required by PSPC

ISO8502-9: Bresle Patch Method

Injecting



Method of Soluble Salt measurement required by PSPC

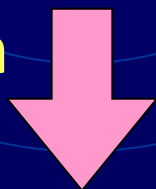
Extracting



Method of Soluble Salt measurement required by PSPC

Measured Electric
Conductivity
($\mu\text{S}/\text{cm}$)

Conversion
Ratio



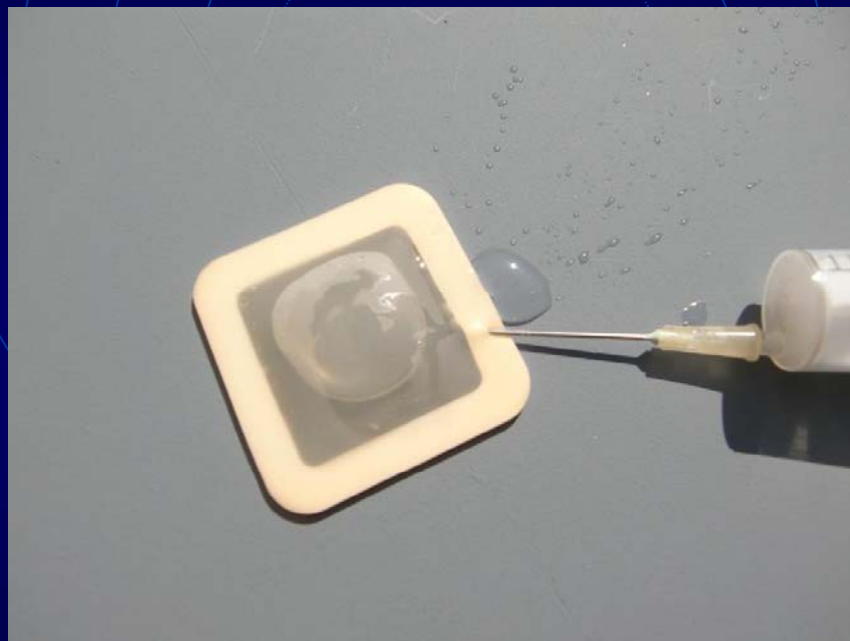
Density of
Water soluble salts
(mg/m^2)

$< 50 \text{ mg}/\text{m}^2$



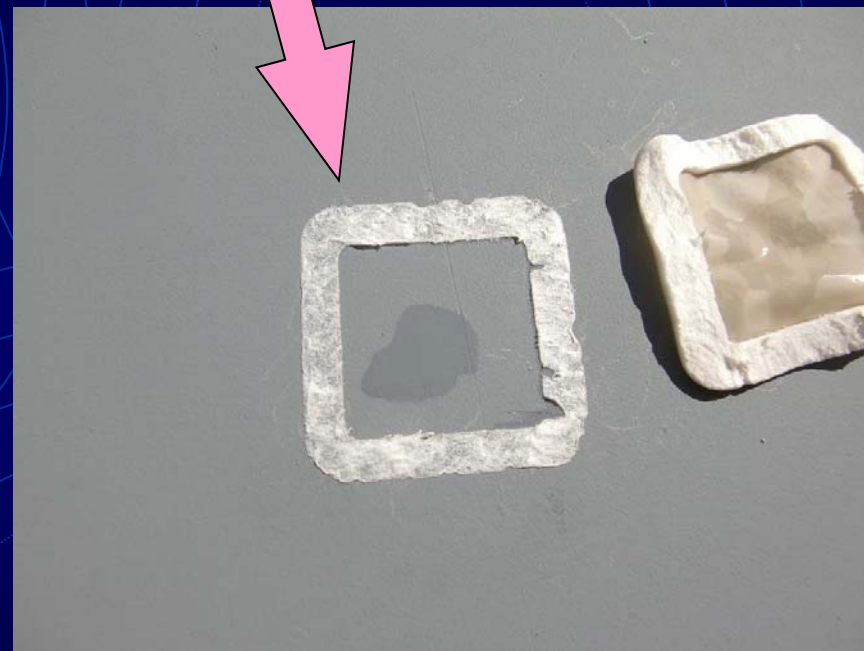
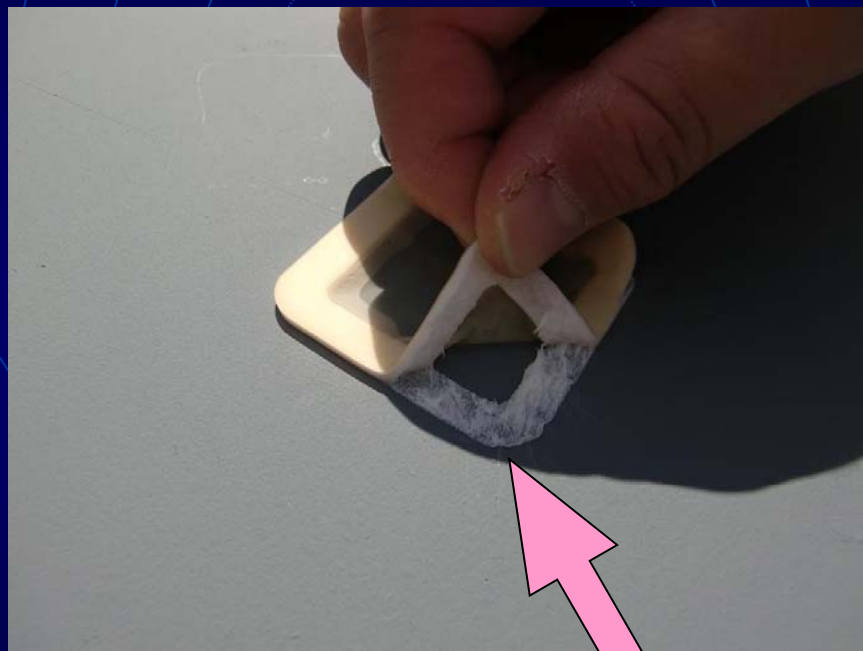
Water Leakage

Failure with about 20%* chance!



*NAMURA's data

GLUE remains on steel surface



The background of the slide is a dark blue gradient. Overlaid on this background are three large, thin, light blue circles that overlap each other. The circles are arranged in a triangular pattern, with one circle at the top left, one at the top right, and one at the bottom center.

We have a **GOOD METHOD** !

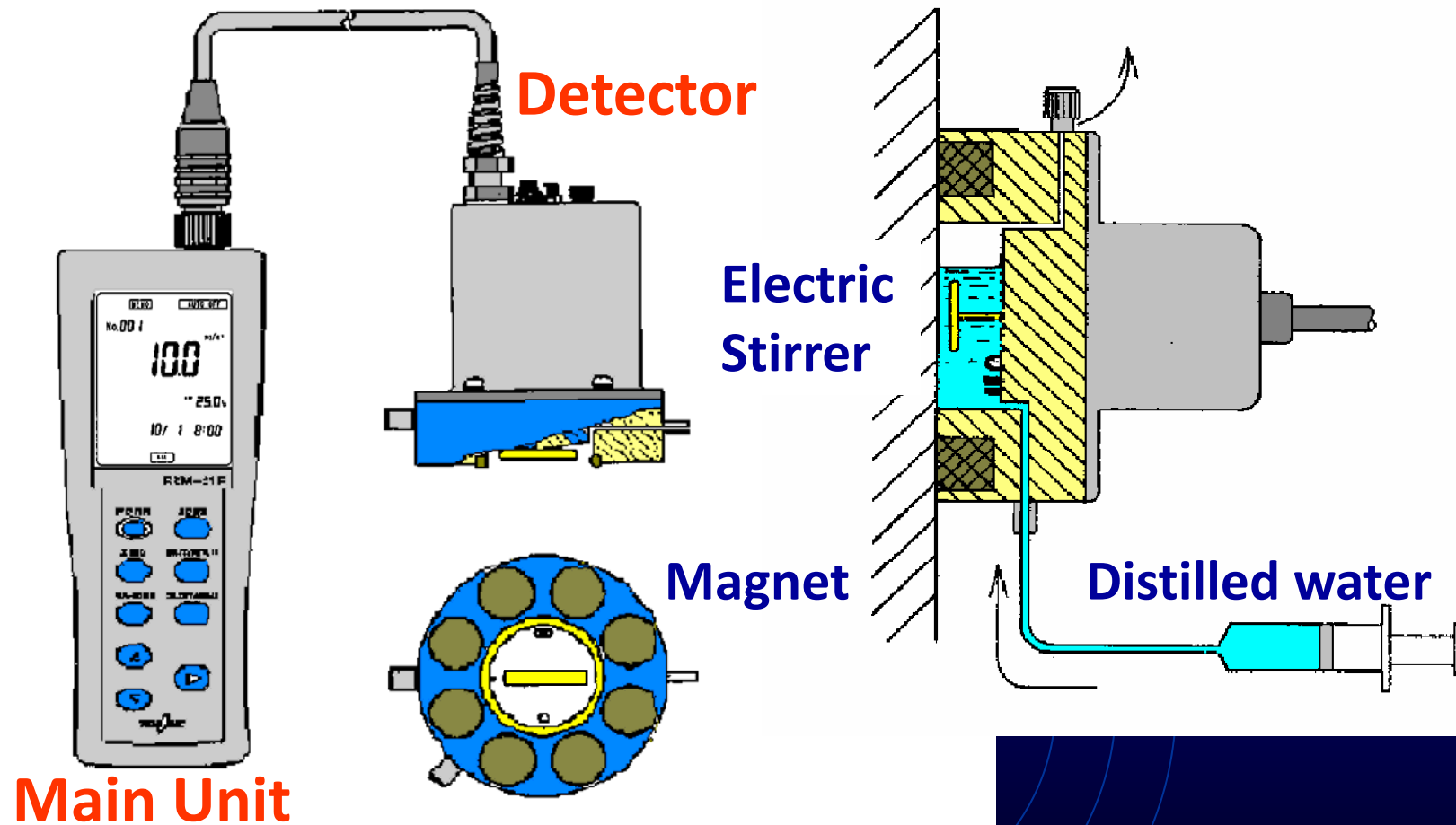
Automated method



Copied from ARP web site



Automated method



Automated method

Injecting Distilled water into Cell



Automated method

Extraction – Stirring Commences



Automated method

Measurement at block stage

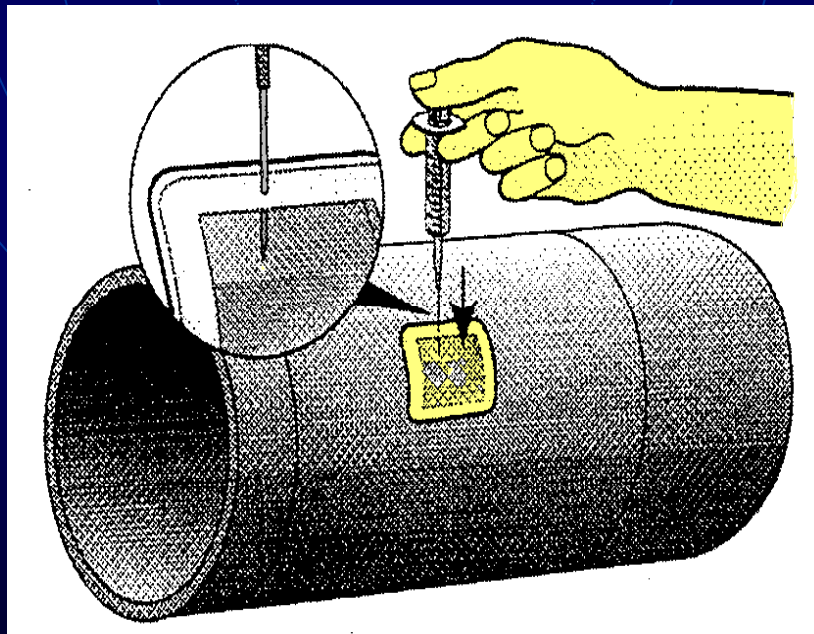


Majority of Japanese shipyards are already using Automated tool extensively.

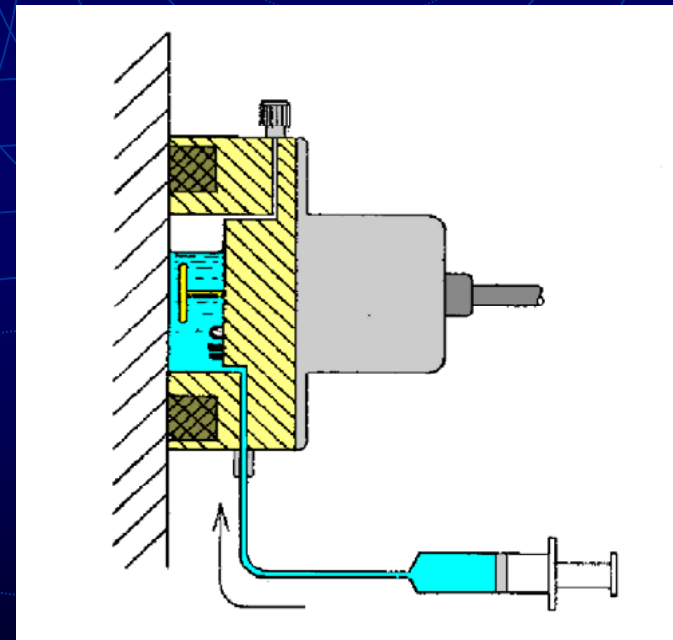
Comparison of Measurement Methods

ISO 8502-9

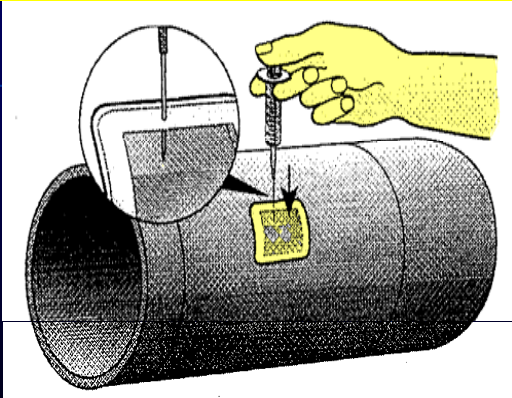
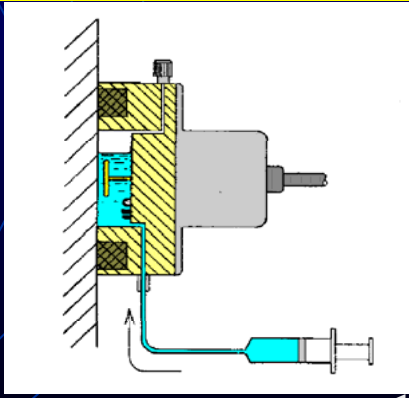
Bresle patch method



Automated method



Comparison of Measurement Methods

ITEM	Bresle Patch method	Automated method
Detection Method	Electric Conductivity method	Electric Conductivity method
Sampling Area	1250 mm ²	1250 mm ²
Measurement Calculation	<ul style="list-style-type: none"> ▪ Conductivity ▪ Cal. to NaCl concentration 	<ul style="list-style-type: none"> ▪ Conductivity ▪ Convert to NaCl concentration Automatically
Consumables	Water, Patch	Water
		

Comparison of Measurement Methods

Bresle patch method

GLUE remained



Automated method

NO GLUE



Advantages of Automated method

Reliability

- Less human error
- Reliable results

Quality

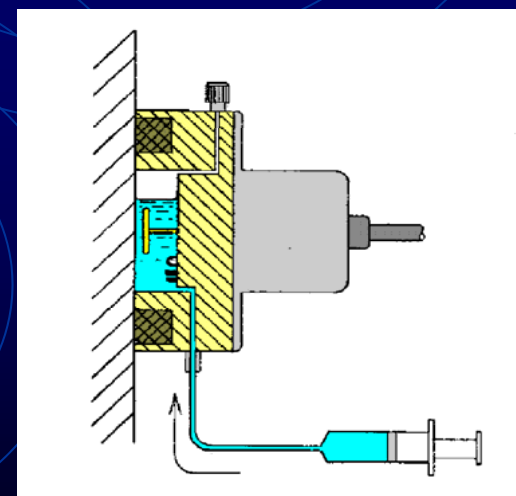
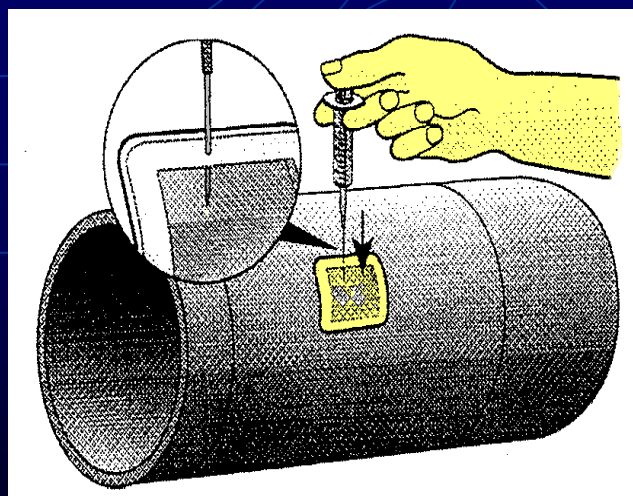
- No Glue remained

Environmental friendly

- Less consumables (Patches)

However . . .

	Bresle Patch method ISO8502-9	Automated method
COT PSPC (MSC.288(87))	Available	Available*
SBT PSPC (MSC.215(82))	Available	NOT Listed




* After adopted at MSC.88

Action by Japan

Submitted a paper to
IMO DE51 (2008/2)

Proposed to use of
Automated ISO 8502-9
(for SBT PSPC)

INTERNATIONAL MARITIME ORGANIZATION

 IMO

E

SUB-COMMITTEE ON SHIP DESIGN AND EQUIPMENT
51st session
Agenda item 14

DE 51/14/2
26 December 2007
Original: ENGLISH

GUIDELINES FOR MAINTENANCE AND REPAIR OF PROTECTIVE COATINGS

Comments on the method of measuring the conductivity of soluble salts

Submitted by Japan

SUMMARY	
<i>Executive summary:</i>	This document provides comments on the application of the report of the Industry JWG/Coatings (DE 51/14/1).
<i>Action to be taken:</i>	Paragraph 7
<i>Related documents:</i>	DE 51/14/1 and resolution MSC.215(82)

Introduction

1 This document is submitted in accordance with the provisions of paragraph 4.10.5 of the revised Guidelines on the organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies (MSC-MEPC.1/Circ.1).

2 Japan appreciates the development of Guidelines for implementation of the Performance Standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers (resolution MSC.215(82)) submitted by BIMCO, CEFIC, ICS, OCIMF, INTERCARGO, INTERTANKO and IACS. However, Japan has comments on soluble salts as given in paragraph 7 of document DE 51/14/1.

Automatic surface salinity meter

3 According to document DE 51/14/1, paragraph 7, "... The conductivity of total soluble salts are measured in accordance with ISO 8502-6 and ISO 8502-9, ...". If only ISO 8502-6 is used, only the Bresle method is applicable. However, there exists an automatic surface salinity meter which has space for the purpose of filling with fresh water and measuring the concentration of electrolytes by measuring the conductivity of the filling water with the same extent of accuracy as the Bresle method. In addition, the automatic surface salinity meter is widely used for quality control and testing for various purposes.

For reasons of economy, this document is printed in a limited number. Delegates are kindly asked to bring their copies to meetings and not to request additional copies.

I:\DE51\14-2.DOC

Action by NACE International

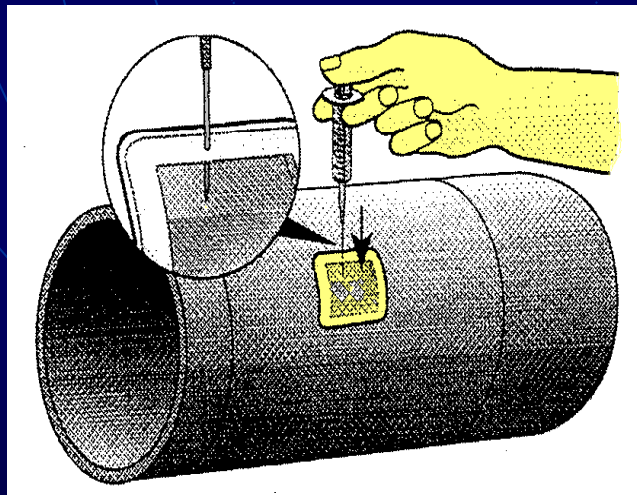
Developed and proposed the standard:
**SP0508-2010 “Standard practice methods of
validating equivalence to ISO 8502-9 on
measurement of the levels of soluble salts”**

Submitted a paper **IMO MSC.88(2010/12)**
and will be accepted for COT PSPC.

Action by NACE International

**NACE
SP0508-2010**

MSC.88
for COT PSPC

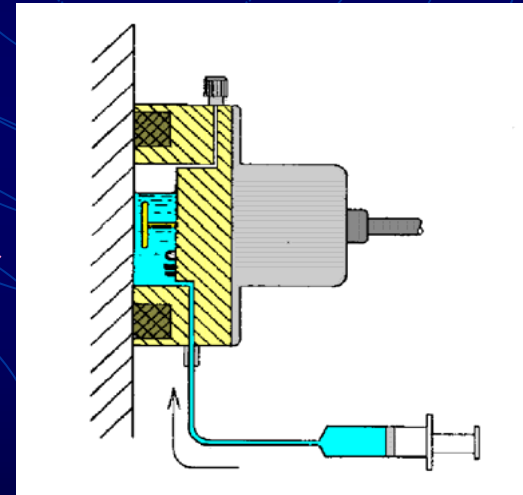


ISO 8502-9

patch method

Bresle

EQUIVALENCE



Automated method

Coming Action at ISO

October 2010~

ISO/TC8/SC8: “Ships and marine technology –
Protective coatings and inspection method –
Measuring method water soluble salts”
(for SBT PSPC & COT PSPC)

Proposed by JAPAN (JASTRA)

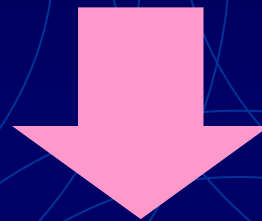
Secretariat: KOREA (KATS)

Target date for availability: July 2013

Road to IMO



ISO Standard for “Automated method”
for SBT PSPC and COT PSPC



Proposing to **revise SBT PSPC**
for availability
“Automated soluble salts method”

Alternative Technology / System for PSPC

Retain and improve,

- Quality of ship (Tank coating)
- Safety of ships' operation
- Protection of the environment

Alternative technology should be proposed
through the **review of PSPC**.

Further Challenges Beyond

NOW, Shipbuilding industry should address to **verify the PSPC** through some experiences,

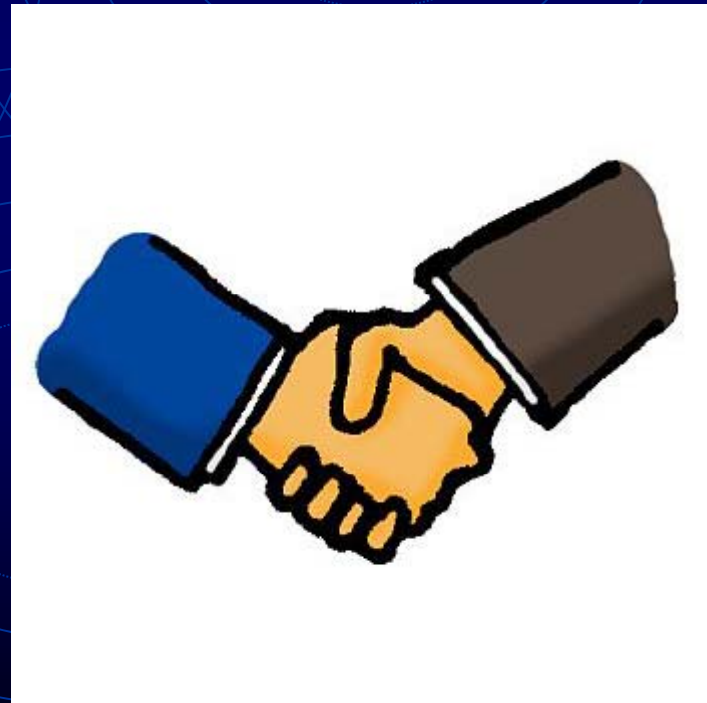
in order to improve the quality and productivity of ship's construction.

Further Challenges Beyond

Asian shipbuilding industry should continue to cooperate and work well together in

- Sharing perceptions,
- Addressing to review and revise the PSPC

for our future.



A close-up, low-angle shot of the dark, metallic hull of a large ship. Several circular portholes are visible along the top edge, with thin streams of water spraying downwards from them. On the right side, a large, rounded pipe or porthole is discharging a powerful, turbulent jet of white water. The ship's hull is dark and shows some texture and rivets. The background is a bright, hazy sky.

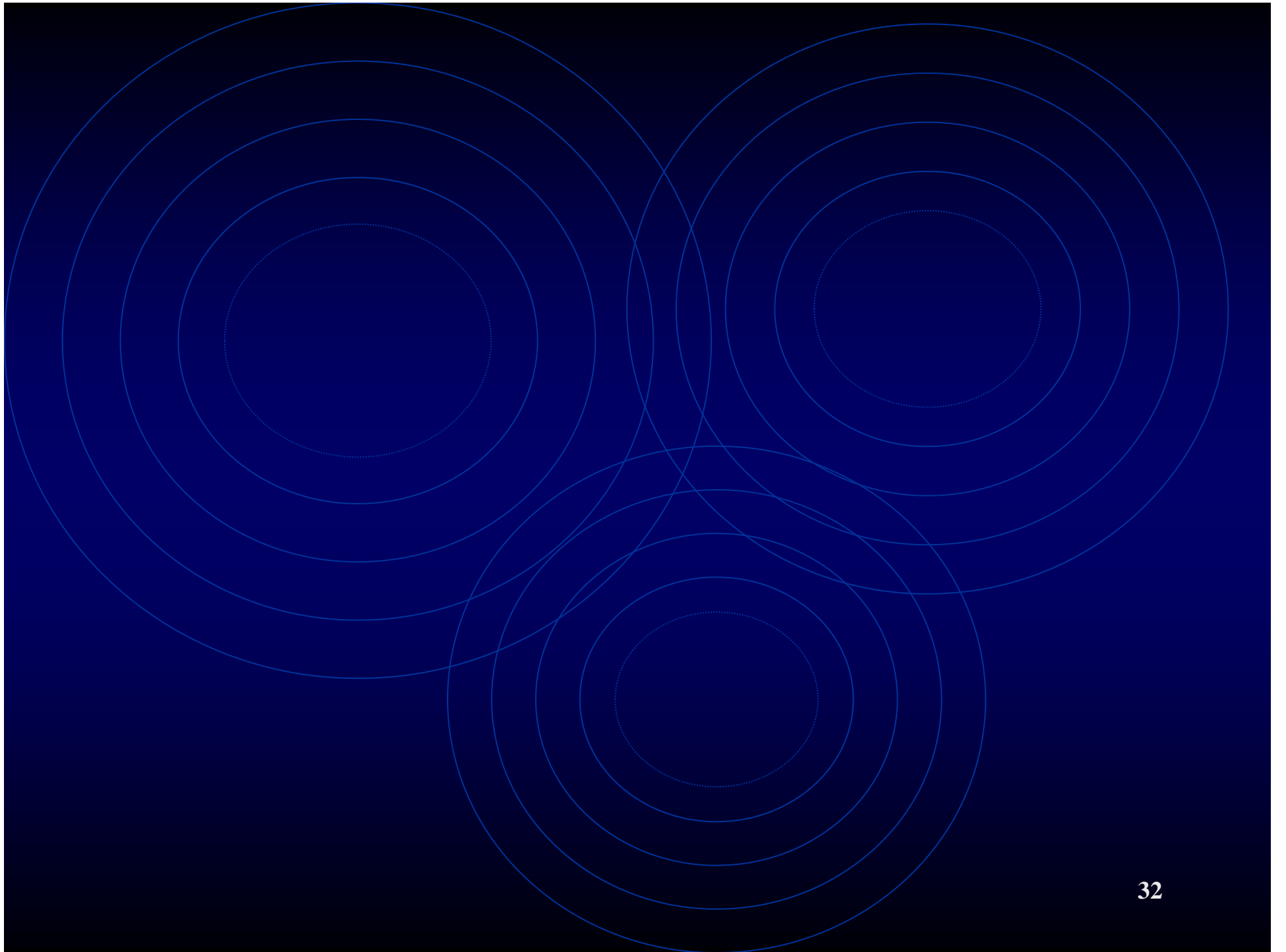
**THANK YOU FOR YOUR
KIND ATTENTION**



**THE SHIPBUILDERS'
ASSOCIATION OF JAPAN**

The background of the slide features three overlapping circles, each containing several concentric rings. The circles are positioned in a triangular arrangement, with one at the top left, one at the top right, and one at the bottom center. The rings within each circle are also concentric and overlap with the rings of the other circles. The entire design is rendered in a light blue color against a dark blue background.

質疑用資料

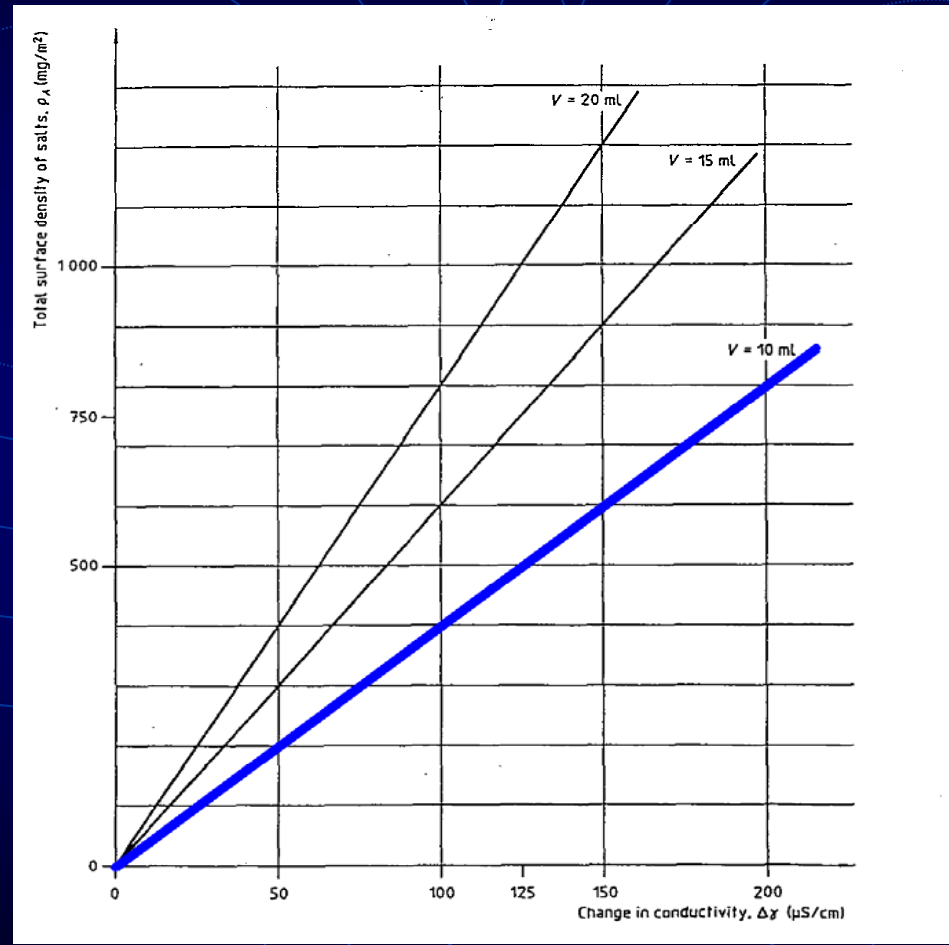


Comparison of Measurement Methods

	Bresle Patch method	Automated method
Sampling	Bresle Patch and injector	Fix to plate with powered stirring
Detection Method	Electric Conductivity method	Electric Conductivity method
Work Time	10 min.	3 min.
Pure Water Consumption	10 ml	10 ml
Sampling Area	1250 mm ²	1250 mm ²
Measurement Calculation	<ul style="list-style-type: none"> ▪ Conductivity Measurement ▪ Calculate to NaCl concentration 	<ul style="list-style-type: none"> ▪ Conductivity Measurement ▪ Convert to NaCl concentration by software
Consumables	Water, Patch	Water



Salt Concentration in Relation to Conductivity



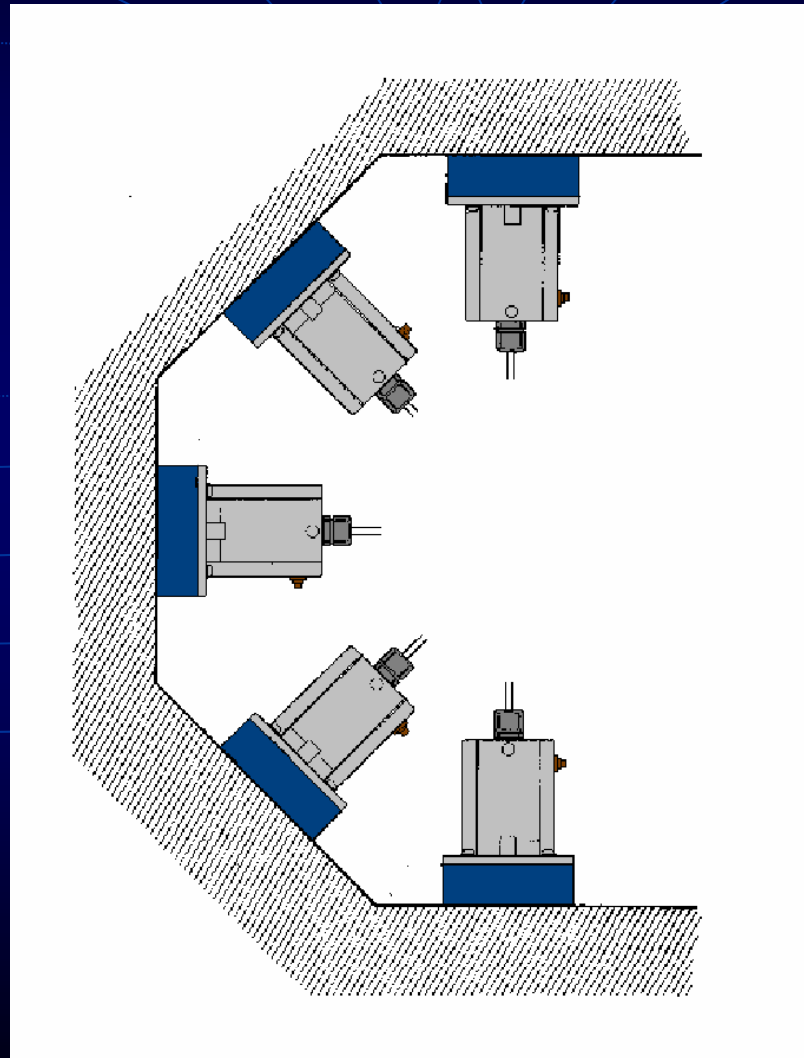
ISO 8502-9 Figure 1

Measured Surface Can be Any Orientation

**Downward
inclined surface**

Vertical surface

**Upward inclined
surface**



**Downward-
horizontal surface**

**Upward-horizontal
surface**

Automated Methods for ISO 8502-6/9

HEDON/ARP :
Soluble Salt Meter



From ARP Website

2010/11/25

NST Center :
Salt Smart



From IMCS 2008
NST presentation

DKK-TOA : Surface
Salinity Meter

