Gard - Conference on Power Operated Watertight Doors 29 May 2013 Norway

Paul Fahy – Product Specialist

Cygnus Instruments Ltd

Ultrasonic Testing of Watertight Doors
Cygnus Hatch Sure

www.cygnus-instruments.com
Introduction

- **Cygnus Hatch Sure** is a Type Approved, ultrasonic system for rapid and thorough testing of the weather tightness of cargo hatch covers or Watertight doors.

- The use of ultrasonic testing is not only a sure way of detecting any damage to the doors seal;

- It can also identify the loss of any watertight integrity that may have occurred during the installation phase of the watertight door.

- This can include deformation to the frame or other misalignments.

- Can also be used to test cable glands or any other item passing through a bulkhead.
Scope of this presentation

• Highlight the benefits of ultrasonic testing

• What are the applications

• Explain how it works – what is ultrasound?

• What is hatch sure? How do we use it?

FAQ

1. How long does it take?
2. When to test?
3. How does this test differ from hatch cover testing?
4. What about training?
Benefits of ultrasound testing

Rapid, accurately locates defects in door seals and can be used to test doors on all deck levels.

Of interest and benefit to Ship-owners/managers & marine surveyors

Does not hold up other ship construction activities and allows for a speedy re-test if the door is not sealed or not watertight first time.

Reduces inspection time compared to normal chalk or hose test for watertight doors. Major time savings are achievable.

The Hatch Sure Mk2 and test procedure has gained Classification Society approval by one of our customers for testing new watertight doors.
Applications

Water tight doors on;

- Bulk carriers
- Car Carriers
- Large yachts and super yachts
- Fishing vessels
- Ferries
- Cruise Liners
- Offshore support vessels
- Naval vessels
- Submarines
- Containers

Small watertight / weathertight enclosures such as forward rope lockers and refrigeration units can now be tested.
What is Ultrasound?

Ultrasound is a sound wave at a frequency beyond the range of human hearing.
1. How long does it take?

Approximately 10 minutes per door including setup

2. When to test:

- During commissioning
- After replacement of rubber sealing
- On request from vessel owner or classification society.
- After any event that may involve damage to the door or seal
- Annual survey

3. How is testing a watertight door different to a Hatch Cover?

There is no acceptable detection threshold for a door. (Hatch cover allow 10%) It is easier than hatch testing because any sound detected above Zero dB is a leak.
Frequently Asked Questions

4. What about Training?

- A Certificate of training in the operation of HATCH SURE is offered by Cygnus Instruments Ltd.

- Cygnus’ Authorised Distributors, who have been trained and certified to deliver this course.

- The certificate of training is accredited by International Institute of Marine Surveyors

- Offers consistent and repeatable standard of training throughout an organisation in terms of the operation of the instrument.

- Carries CPD points
What is Hatch Sure?

Ultrasound transmitter

Ultrasound receiver

microphone

Airborne Ultrasound

Ultrasound transmitter

Ultrasound receiver
How do we use it?

1. Hatch Sure Receiver
2. Telescopic Extension
3. Headphones
4. Inspection Microphone
5. Remote Control to Transmitter
6. Watertight door
7. Transmitter

The diagram shows the setup for using the Hatch Sure Receiver with a Telescopic Extension, Headphones, Inspection Microphone, and Remote Control to Transmitter. The Watertight door is also shown as part of the setup.
Test Method

Safety Note: The operation of watertight doors must only be carried out by a competent person familiar and trained in the operation of the specific door type under test and with the permission of the person in charge.

Never step through a moving door!

1. Position the transmitter at a distance not less than the maximum dimension of the door, e.g., if the door is 2.2 m x 1.1 m, then the distance \( x \) (Fig. 1) is not less than 2.2 m*1

Note: Some doors are of greater width than height, so the width \( W \) will become the distance \( x \) (Fig. 1).

\[
\text{If } W<H \text{ then } x = \geq H \\
\text{If } W>H \text{ then } x = \geq W
\]

*1 – Cygnus guideline \( x \) can be reduced by proven procedure
Test Method

Fig 1.

Diagram courtesy of IMS
2. Switch the Transmitter on and set the power level

Note: Once the power setting for a particular type and size of door has been established, then this setting can always be used *1

3. Calibrate the receiver using the ‘set OH’ key (see page 31 of the operating manual).

4. Record the open door dB level (possibly including photograph) in the report.

5. **Observing ALL relevant safety procedures,**
   
   Close the door. The receiver should now read zero dB.

*1 Providing the door size, type, manufacturer and distance setting is always the same.
6. Check the seal around the door frame by moving the inspection microphone along the rubber seal.

   The microphone should be as close as possible to the rubber seal, without actually making contact.

7. If any leaks are found, record, report to the relevant third parties and take appropriate corrective actions.

8. When re-tested, ensure steps 1 to 6 are repeated exactly as before.
Ultrasound transmitter

STEEL DOOR

DOOR SEAL

DOOR FRAME

ULTRASOUND RECEIVER

Thank you

LEAK

Summary