



GUIDE FOR CLASSIFICATION NOTATION

TAILSHAFT CONDITION MONITORING (TCM)

MARCH 2005 (Updated July 2012)

1 General

1.1 Notation

Where requested by the Owner, the class notation **TCM (Tailshaft Condition Monitoring)** may be assigned to a vessel with tailshafts specifically arranged with oil-lubricated stern tube bearings, provided the following requirements are complied with.

3 System Requirements

In addition to the requirements for propulsion shafting in Section 4-3-2 of the *ABS Rules for Building and Classing Steel Vessels*, the following design requirements are to be complied with and relevant drawing(s) and data are to be submitted for review and approval prior to commencement of the initial surveys as specified in 7.1.

3.1 Temperature Monitoring and Alarm (1 July 2012)

The vessel is to be provided with a temperature monitoring and alarm system for the tailshaft stern tube aft bearing. The system is to be arranged with a high temperature alarm and two sensors. One easily interchangeable sensor may be installed in lieu of the two sensors. Where one interchangeable sensor is installed, one spare sensor is to be carried onboard the vessel.

The monitoring and alarm system is to have the following features:

- i) The main alarm system is to be provided with a power failure alarm.
- ii) An alarm that indicates an open circuit, a short circuit, or an earth fault in the temperature sensor circuit is to be provided
- iii) An alarm indicating that the sensor's temperature signal is outside the set points of the unit is to be provided.

Temperature monitoring and the alarm system are to be located in the propulsion machinery spaces. For **ACC/ACCU** machinery spaces, the temperature monitoring and alarm system is to be incorporated with the required control and monitoring system.

When a centralized control or monitoring station is installed, the alarms are to be activated in such a station.

3.3 Oil Seal Design

Approved type oil seals are to be used which will allow for replacement without the shaft withdrawal or removal of the propeller.

3.5 Bearing Wear Down Measurement

Arrangements and means are to be provided for bearing wear down measurement.

5 Management of the Monitored Data

The following management of the monitored data is to be implemented.

5.1 Lubrication Oil Sampling (1 March 2009)

Stern tube bearing lubricating oil is to be analyzed regularly. Oil samples are to be taken under service conditions and are to be representative of the oil within the stern tube. Samples are to be analyzed monthly for water content by using a suitable test kit. Additionally, at least every six months, oil samples are to be submitted for analysis to a recognized laboratory where testing is to be conducted for the following:

- i)* Free water content in oil, if present
- ii)* Bearing metals content (Pb, Fe, Cu, Al, Cr, Sn, Si, Ni)
- iii)* Viscosity at 40°C

5.3 Stern Tube Bearings Operating Condition

Stern tube bearing temperatures are to be monitored and temperature recorded daily. The system's oil consumption is to be recorded monthly.

5.5 Recording and Analysis

The chief engineer is responsible for recording and maintaining a file of the shipboard performed lubricating oil sampling and analysis results, as well as stern tube bearings operating condition. Also, the results of the laboratory analysis are to be stored within the file onboard. All documentation is to be available to the Surveyor to allow for trend assessment of the measured parameters.

The shipboard record is to contain conclusions regarding the condition of the oil and whether it remains suitable for further use. Conclusions are to be supported by comparative parameters.

In case of oil replacement, a record containing the reason for replacement of the oil is to be maintained for Surveyor's review at the next Annual Survey.

7 Surveys

7.1 Initial Survey

All systems required by this Guide are to be examined and tested to the satisfaction of the attending Surveyor in accordance with the approved plans to verify compliance with this Guide.

For initial survey of existing vessels, refer to [7-9-19/1.3](#) of the *ABS Rules for Survey After Construction*.

7.3 Survey After Construction

Refer to [Section 7-9-19](#) of the *ABS Rules for Survey After Construction*.