Transducer Alignment and LBL calibration

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Abstract

Acoustic positions are used as reference for DP systems. This note describes alignment and calibration that must be done for the acoustic systems.

Acoustic Super Short BaseLine (SSBL) systems measure the position of a transponder on the seabed relative to the transducer. It is done in the transducer's co-ordinate system. The position must be transformed to a position relative to the vessel reference point in the vessel's co-ordinate system before it can be used as a DP reference. In order to do so, the acoustic system must know the alignment of the transducer relative to the vessel, and the position of the transducer relative to the vessel reference point. The process to decide these values is often referred to as transducer calibration. The name "calibration" is misleading, because no parameters within the transducer are calibrated. We therefore name the process transducer alignment, which describes the process better. Accurate transducer alignment has earlier required a survey computer and the assistance of a surveyor. Now this function is incorporated into the HiPAP system, and it can be done by the personel on the vessel. Chapter 2, and the first section in the presentation, describes how the function is implemented into the HiPAP systems.

Acoustic Long BaseLine (LBL) systems calculate the position of the vessel by measuring the ranges, and optionally the directions, towards transponders in the LBL array on the seabed. To do so, the acoustic system must know the positions of the transponders relative to each other in a north east co-ordinate system. The process to decide these positions is LBL calibration. Accurate LBL calibration has earlier required the baselines between the transponders to be measured. It has also required box-in of either one or more of the transponders or of the whole LBL array to decide the orientation of the LBL array relative to geographical north. The measurements of the baselines between transponders require free line of sight between them, which in some cases is difficult to obtain. The LBL calibration could therefore be time-consuming. Now a new function, LBL run time calibration, is implemented into the HiPAP systems. It utilizes the accurate range and angle measurements to calibrate the LBL array. The baseline measurements between the transponders are no longer needed. The new function was introduced one year ago, and has been used to a great extend since. It is described in chapter 3 and in the last section of the presentation.

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