GEOBASE

VESSEL DIMENSIONAL CONTROL SOFTWARE & TRAINING

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Course Aims

To equip an individual with the theoretical and practical knowledge required to plan, undertake and report a vessel dimensional control survey. The course contents are aligned to guidance from professional surveying bodies and cover vessel dimensional control survey practices used on vessels engaged in nautical charting and the offshore energy industry. The course includes land and hydrographic surveying principles which underpin the conduct of a vessel dimensional control survey.

The course will:

- Introduce the theory of hydrographic and geophysical surveying and the requirements for accurate vessel dimension data;
- Introduce accuracy standards used in hydrographic surveying and how the dimensional control survey contributes to reducing the error budget;
- Introduce the theory of land surveying and how these practices are translated into the dimensional control survey;
- Introduce the range of survey sensors available for performing hydrographic surveys and explain how to deal with these during a dimensional control survey;
- Introduce the concepts of vessel design and how this is important when planning hydrographic survey sensor installation and the dimensional control survey;
- Train how to review a dimensional control specification and plan how the survey will be undertaken;
- Train how to utilise total station and GNSS technology to conduct the vessel dimension control survey including: setting up both a local and vessel reference frame on a static and floating vessel, observing offsets, and capturing data for the calibration of attitude and heading sensors;
- Train how to process dimensional control data using software packages such as Microsoft Excel, AutoCAD and GEOBASE;
- Introduce the expected formats for dimensional control survey reporting.

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Intended Learning Outcomes of Course

On completing this course students will be able to:

- Explain the importance of dimensional control surveying on offshore survey vessels and other offshore survey platforms (e.g. ROV, Trenchers);
- Plan a dimensional control survey on both a floating and static vessel including the definition of vessel and local reference frames;
- Explain coordinate and rotation conventions and how these are used and applied during a dimensional control survey;
- Use total station technology to install a control network on a vessel and observe points within that network to millimetric accuracy;
- Use total station and GNSS technology to collect data for the calibration of vessel-based attitude and heading sensors;
- Use relevant software for the processing of total station data including network adjustments and least squares analysis;
- Process and present dimensional control data so it can be successfully applied and used within the vessel survey software;
- Conduct total station and GNSS verification procedures to confirm the accuracy of dimensional control data and that data is applied correctly within the vessel survey software;
- Prepare a comprehensive report of a survey containing relevant and easy to understand data.

Sample Programme - Day 1

Activity/Lesson	Classroom Theory	Practical Session
Hydrography and meeting the error budget Within this classroom based session we discuss the accuracy requirements of hydrographic surveying, error budgets, the effects of inaccurate vessel dimension data and how accurate dimensional control data contributes to reducing the error budget and improves overall survey data quality and accuracy.	✓	
Hydrographic survey equipment and software Within this classroom based session we discuss the different types of vessel, their operations and the types of survey sensors, their function, accuracy and location on the vessel, and how we need to consider all of these factors when planning a dimensional control survey.	✓	
Land survey equipment and software During this session we will be introducing total station technology used in conducting the vessel dimensional control survey. We will be introducing land survey theory including setting up coordinate grids, orientation, levelling and unlevelled setups, traversing, resections, and total station calibration.	✓	
Total station operation During this session we will be using total stations to practice setting up, levelling, observing points and moving the total station within a control network whilst maintaining accuracy.		✓

Sample Programme - Day 2

Activity/Lesson	Classroom Theory	Practical Session
Planning a dimensional control survey Within this session we will review typical survey specifications and discuss how we plan a survey to meet the requirements. We will look at accuracy and precision requirements, establishing local and vessel reference frames, and how understanding vessel design contributes to the accuracy of a dimensional control survey.	✓	
Dimensional control offset survey During this session students will complete a dimensional control offset survey on a mock up of a survey vessel, including establishing a control network, defining reference frames on the vessel, observing points of interest, preparing for attitude and heading calibrations)		✓
Attitude and heading sensor calibration During this session we will discuss the fundamental principles of calibrating the vessels survey grade attitude (MRU/IMU/INS) and heading (gyro) sensors. We will focus on different types of sensor and the importance of understanding their coordinate and rotation conventions.	✓	✓

Sample Programme - Day 3

Activity/Lesson	Classroom Theory	Practical Session
Dimensional control calibration survey During this session students will complete a dimensional control calibration survey on a mock up of a survey vessel, including installing RTK GNSS shore control, datum transformations, scale factor, convergence, total station observations to vessel baselines and navigation checks.		✓
Data processing During this session students will utilise software packages such as Microsoft Excel, AutoCAD and GEOBASE to process dimensional control offset and calibration data. This will include network adjustments, the principles of Least Squares Adjustment and working in an environment where 6 degrees of freedom need to be considered.		✓

Sample Programme - Day 4

Activity/Lesson	Classroom Theory	Practical Session
Verification procedures During this session students learn how to verify the results of their dimensional control offset and calibration data through field measurements.		✓
Data processing & reporting continued… During this session students will continue with data processing of dimensional control data and verifications, and will learn how to present data in a format that is easily understood by the end user.		✓

Course Fees...

- 4 day training course = £POA for one delegate
- Additional delegates £POA per person per day

Course fees include:

- 12 month subscription to the GEOBASE software
- Hot Lunch (if hosted at GEOSIGHT offices in UK)
- All course training materials and equipment for the duration of the course

Course fees do not include:

- Delegate travel to and from course location
- Accommodation

Course fees listed are based on hosting at GEOSIGHT offices in the UK. Courses delivered at client offices will be subject to additional travel costs for GEOSIGHT personnel.