

# Certified Hydrographic Surveyor Knowledge, Practice and Responsibilities

## **1.0 Standards of Competence for Hydrographic Surveyors - Knowledge**

The Australasian Hydrographic Surveyors Certification Panel (AHSCP) certifies hydrographic surveyor competence in accordance with the International Hydrographic Organisation (IHO) publication S-5A (Standards of Competence for Category “A” Hydrographic Surveyors) and S-5B (Standards of Competence for Category “B” Hydrographic Surveyors). The S-5 is a syllabus for educational and training programmes, principally Category “A” and Category “B” for Hydrographic Surveyors.

The subjects covered under the Standards are:

### **S-5A Category “A” for Hydrographic Surveyors**

- **Basics:** Mathematics Statistics, Theory of Observations, Information and Communication Technology, Physics, Nautical Science, and Meteorology
- **Foundation Science:** Earth Models, Oceanography, Geology and Geophysics
- **Hydrographic Science:** Positioning, Underwater Sensors and Data Processing, LiDAR and Remote Sensing, Survey Operations and Applications, Water Levels and Flow, Hydrographic Data Acquisition and Processing, Management of Hydrographic Data, Legal Aspects
- **Complex Multidisciplinary Field Project**

### **S-5B – Category “B” for Hydrographic Surveyors**

- **Basics:** Mathematics Statistics, Theory of Errors, Information and Communication Technology, Physics, Earth Sciences, Nautical Science and Meteorology
- **Essentials:** Underwater Acoustics, Remote Sensing, Water Levels and Flow, Positioning, Hydrographic Practice, Hydrographic Data Management and Environment
- **Comprehensive Final Field Project**

## **2.0 Hydrographic Surveyor Certification - Practice**

Hydrographic Surveyors are certified at two competency levels, Level 1 and Level 2, which approximate the Category “A” (Cat A) and Category “B” (Cat B) academic qualification but with important differences. In addition to recognising the academic qualifications of an applicant who has completed a Cat A or Cat B course, the AHSCP also recognises equivalent qualifications. All applicants must also demonstrate appropriate practical experience in order to attain certification as a Hydrographic Surveyor.

### **2.1 Level 1 Certification**

Certification as a Level 1 Hydrographic Surveyor is the highest attainable level of professional hydrographic surveying certification. As a Level 1 Hydrographic Surveyor, an individual is expected to have:

- A deep understanding (degree equivalent level) of the theoretical aspects of hydrographic surveying.
- Extensive experience in practical hydrographic surveying.

- Experience in leadership and management of projects and teams.

A Level 1 Hydrographic Surveyor is expected to be able to:

- Plan, undertake and manage complex hydrographic surveying projects.
- Identify sources of error and resolve data discrepancies.
- Maintain quality assurance principles.
- Provide professional advice on hydrographic matters.
- Compile and approve project reports and deliverables.

## **2.2    Level 2 Certification**

Certification as a Level 2 Hydrographic Surveyor recognises a practical comprehension of hydrographic surveying and is the initial professional level of hydrographic surveying certification. As a Level 2 Hydrographic Surveyor an individual is expected to have:

- A fundamental understanding (Diploma equivalent level) of the theoretical aspects of hydrographic surveying.
- Practical experience in conducting various hydrographic surveying tasks.

A Level 2 Hydrographic Surveyor is expected to be able to:

- Undertake the survey plan as directed.
- Process data.
- Prepare charting and reporting.

## **3.0    Certification of Sub-Specialisms**

Applicants are initially certified at Level 1 as a Hydrographic Surveyor i.e. they have the demonstrated requisite academic qualifications and experience to undertake most forms of hydrographic survey at Level 1. The certified Hydrographic Surveyor is therefore a 'generalist' and in theory, able to undertake many types of hydrographic survey task. A similar 'generalist' analogy would be a medical student, who on passing their exams, then consolidates via practise as a General Practitioner.

The AHSCP however, also recognises that many surveyors will sub-specialise in a particular field of hydrography and may therefore wish to seek additional certification in that particular sub-specialism (discipline) to differentiate their skillset. The AHSCP considers that identifying a sub-specialism as an important activity. It aids in quickly identifying a hydrographic surveyor to conduct a very particular and more specifically practiced component of Level 1 hydrographic surveying.

Applicants may apply for certification in any sub-specialism of hydrography at the initial application or at any time post-certification. Certification in multiple sub-specialisms is possible.

Level 1 Hydrographic Surveyors can be certified in the following sub-specialisms of hydrography:

- (i)    **Hydrography in Support of Coastal Management** - Applicants will need to demonstrate a higher level of experience and expertise against the following topics of the Foundation Science (F) and Hydrographic Science (H) subjects detailed/outlined in the S-5A publication:
  - a.    F1.3 – Land surveying methods and techniques
  - b.    F3.1 – Geology
  - c.    F3.2 – Geophysics
  - d.    H2.5 – Backscatter

- e. H3.1 – LiDAR
  - f. H3.2 – Remote sensing
  - g. H4.1 – Hydrographic survey projects – with a focus on dredge surveys, port limit surveys, berth surveys, geotechnical surveys, geophysical surveys, engineering surveys, profiling monitoring, estuarine surveys, Rapid Environmental Assessment surveys and climate change investigation.
  - h. H4.3 – Seabed characterisation
  - i. H5.3- Tide modeling
  - j. H5.4 – Ellipsoidal separation models and vertical datum
  - k. H7.3 – Spatial data integration and deliverables – with a focus on survey plans and drawings
- (ii) **Hydrography in Support of Inland Waters Management** - Applicants will need to demonstrate a higher level of experience and expertise against the following topics of the Foundation Science (F) and Hydrographic Science (H) subjects detailed/outlined in the S-5A publication:
- a. F1.3 – Land surveying methods and techniques
  - b. H3.1 – LiDAR
  - c. H3.2 – Remote sensing
  - d. H4.1 – Hydrographic survey projects – with a focus on dam surveys, river and lake surveys, hydraulic engineering surveys, flood plain mapping, elevation modeling, and volumetric calculations
- (iii) **Hydrography in Support of Offshore Infrastructure Development** - Applicants will need to demonstrate a higher level of experience and expertise against the following topics of the Foundation Science (F) and Hydrographic Science (H) subjects detailed/outlined in the S-5A publication:
- a. F3.1 – Geology
  - b. F3.2 – Geophysics – with a focus on F3.2c seismic surveys
  - c. H1.4 – Subsea positioning
  - d. H2.5 – Backscatter
  - e. H3.1 – LiDAR
  - f. H3.2 – Remote sensing
  - g. H4.1 – Hydrographic survey projects – with a focus on geophysical surveys, seismic surveys, rig positioning, engineering surveys, volumetric calculations, pipe and cable lay, jacket / platform installation, seabed mapping, pipeline route surveys, and geotechnical surveys
  - h. H4.3 – Seabed characterisation
- (iv) **Hydrography in Support of Safe Navigation** - applicants will need to demonstrate a higher level of experience and expertise against the following topics of the Foundation Science (F) and Hydrographic Science (H) subjects detailed/outlined in the S-5A publication:
- a. F1.3 – Land surveying methods and techniques
  - b. F2.1 – Physical oceanography and measurements
  - c. H3.1 – LiDAR
  - d. H3.2 – Remote sensing
  - e. H4.3 – Seabed characterisation
  - f. H4.1 – Hydrographic survey projects – with a focus on planning, collection, assessment and presentation of data to support marine navigation, rendering surveys to support official navigation products, mine countermeasures, route surveys, submarine bottoming areas, and surveys for declaration of depth.
  - g. H5.3 – Tide modeling
  - h. H5.5 - Currents
  - i. H7.3 – Spatial data integration and deliverables – with a focus on nautical charting and military survey requirements
  - j. H8.2 – Maritime zones

#### **4.0 Certified Professional Hydrographic Surveyor (CPHS) 1 – Responsibilities**

A CPHS 1 is expected to uphold similar behaviours in ethics, morals and practice, assuming responsibilities and accountabilities as would be expected of a Registered or Licensed Land Surveyor under a State or Territory's surveying legislation.

- (i) **Project Management** - In a supervisory capacity a CPHS 1 is expected to be able to manage hydrographic survey projects in a quality assured manner by being:
  - a. Responsible for understanding the requirements of the hydrographic project and the technical standards to be complied with. Providing customers with professional advice to support a risk based approach to hydrographic survey projects.
  - b. Responsible for the survey team members' conduct and standards whilst under their direct supervision.
  - c. Responsible for the sign-off of the mobilisation and calibration phase, ensuring the survey system is implemented to relevant survey practices and required standards. It is highly recommended this be undertaken on site where possible. For remote operations where site visits are not possible, a detailed methodology must be developed to meet the required standard.
  - d. Responsible for developing and enforcing the methodology, QA & QC requirements suitable to satisfy all relevant Client and applicable standards for the Project.
  - e. Responsible for the daily conduct and execution of the survey to meet required standards during the survey acquisition phase with an emphasis on quality and accuracy. This includes the sign-off of final compliance checks.
  - f. Responsible for the sign-off of the Survey Reporting and Deliverables to meet the required standard.
  - g. Implementing and maintaining detailed procedures for project surveyors to follow to ensure data quality is maintained.
  - h. Assuring that claimed Logbook experience has been verified.
  - i. Ensuring that CPHS 1 status is current when signing documentation as a certifying Level 1 Hydrographic Surveyor
  - j. Providing mentoring and correction to survey team members when under their direct supervision.