

Hydrography and Offshore

Introduction

The CLS may be involved in hydrographic or offshore surveys on occasional basis or full time. The CLS should be aware of the relevant standards and best practices detailed below.

Federal Government Hydrographic Standards

The Canadian Hydrographic Service (CHS) represents Canada's hydrographic interests on various entities that develop and oversee hydrographic and chart information standards. The primary worldwide body which deals with these standards is the International Hydrographic Organizations (IHO).

CHS has adopted and/or established several standards in cooperation with the IHO to as follows:

- Advance hydrographic expertise and knowledge.
- Ensure hydrographic products and services are available to clients in a timely manner.
- Support safe navigation through internationally recognized standards and best practices.

CHS standards adhere to rigorous international standards for conducting federal government hydrographic surveys. These include as follows:

- IHO Standards for Hydrographic Surveys (S-44), and
- Hydrographic Survey Management Guidelines

The Hydrographic Survey Management Guidelines are based on international and CHS experience and best practices. The current second edition of the Guidelines are dated June 2013. The document is available online at Fisheries and Oceans Canada / Science and Research / Science and Research by Topic / Water Science and Hydrography / Hydrography / Standards for Developers / Hydrographic Standards / Hydrographic Survey Management Guidelines at <https://ppa.gc.ca/sites/default/files/2018-09/CHS%20Standards%20for%20Hydrographic%20Surveys.pdf>.

Commercial Hydrographic and Offshore Surveys

Commercial hydrographic and offshore surveys may follow the Hydrographic Survey Management Guidelines or some other standards relevant to the project, which is being supported by the required collection of seabed topography and other engineering information. Generally, such projects could be on Canada Lands on rivers and lakes in the Territories, bays and straits along Canada's three coasts, and nearshore or offshore off of Canada's three coasts.

Be aware that hydrographic and offshore surveys are expensive. The financial consequences of making a small error in specifying the work can be disproportionately costly. Survey specifications, if they are to be comprehensive and appropriate, can only be fully developed by the assessment of a particular project's objectives, in relation to particular circumstances and conditions.

There are many other purposes for hydrographic surveys besides nautical charting. This would include surveys in support of engineering construction projects such as communication and power cable lays, and river crossings for pipelines and bridge works. Also, surveys in support of port management and coastal engineering such as dredging, environmental and hydraulics monitoring.

Generally, the engineering requirements of such projects may not be met by the Hydrographic Survey Management Guidelines. The charting requirements fulfilled by following the Hydrographic Survey Management Guidelines, usually do not meet the need for the more detailed spatial and geotechnical information and mapping required for these projects.

For specialist commercial hydrographic and offshore surveys the project surveyor could consider discussing the project requirements with a hydrographic or offshore survey specialist or company. A listing of ACLS approved Certified Hydrographers (CH) and Certified Hydrographic Technicians (CHTech) personnel is provided on the ACLS website at Resources / Certified Hydrographers at <https://www.acls-aatc.ca/certified-hydrographers/>.

Whenever possible the project surveyor should ensure the seabed positioning and depth of burial of offshore infrastructure surveys related to communication and power cables, should be shared with the appropriate federal, provincial and territorial bodies besides being provided to the client. The project surveyor should ensure the seabed positioning is as accurate as possible taking into account the water depth and layback of the touchdown point.

The project surveyor may wish to consult ***Canada's Offshore: Jurisdiction, Rights, and Management***, 3rd edition (Ottawa, ACLS, 2006), which is available to purchase from the ACLS office in English and French. The colour versions of the figures are available on the ACLS website at Offshore Expertise / Offshore Book Images at <https://www.acls-aatc.ca/offshore-expertise/offshore-book-images/>.

Commercial Oil and Gas Offshore Surveys

Legal surveys carried out by the project surveyor related to oil and gas are carried out under the *Canada Oil and Gas Regulations*. The requirements for such surveys are discussed more fully in the ***National Standards for the Survey of Canada Lands*** in "Chapter 11: Oil & Gas Surveys – NT, NU, and Offshore".

However, there are a variety of other non-legal surveys used by the offshore oil and gas industry as shown in the Table below:

Category	Surveys
Drilling Support	Drilling rig positioning, drilling rig anchor placement in congested areas, and drilling rig leg or blowout preventer seabed inspections.
Site, Hazard and Environmental Surveys	Site, hazard and environmental surveys including prior to shallow water seismic surveys, engineering surveys prior to platform installation, pipeline route selection, surveys prior to offshore drilling, submarine cable route selection and lay, and baseline and monitor environmental surveys.
Pipeline Lay and Rectification Work	Pre-lay, lay, as-built, trenching and ploughing surveys; rectification work required such as dead man anchor deployment(s), pipeline defences and pipeline crossing(s); and pipeline inspection surveys.
Construction Support	Platform installation, platform as-built, and platform dimensional control surveys for gravity-based, pile-driven, guyed, floating, and tension-leg platforms.
Platform Decommissioning	Hazard, decommissioning and platform removal, debris clearance and seabed rectification.

For all of these surveys surface and seabed positioning are critical, along with any depth of burial or height above the seabed information required, beside other engineering information collected.

Whenever possible the project surveyor should ensure seabed positioning and depth of burial or height above the seabed of offshore infrastructure such as offshore pipelines, flowlines, umbilicals, and subsea structures should be shared with the appropriate federal, provincial and territorial bodies besides being provided to the client.

Online Specification Information

When using online specification information the project surveyor should perform a critical analysis of the information found to ensure it meets the requirements of the particular circumstances and conditions of the specific project.

Besides any information provided by Canadian provincial survey and engineering associations (if available), the project surveyor could examine additional information from other organizations, as may be appropriate, such as follows (listed alphabetically):

- IHO relevant publications selected from the “Index of IHO Publications” at <https://iho.int/en/iho-publications>.
- International Marine Contractors Association (IMCA) relevant guidance notes from Resources / Publications / Guidance and Technical Reports / Offshore Survey Division at <https://www.imca-int.com/divisions/survey/publications/>.
- The Surveyors Association in the United Kingdom (TSA) relevant “Client Guides” and “Guidance Notes” at <https://www.tsa-uk.org.uk/>.
- United States National Oceanographic and Atmospheric Administration, National Ocean Service, Office of Coast Survey, Hydrographic Survey Standards and Deliverables 2019 at <https://nauticalcharts.noaa.gov/publications/docs/standards-and-requirements/specs/hssd-2019.pdf>.

Typically, the client may have contract specifications that could be used as a guide. However, some specifications may be dated and not reflect current technologies, which could provide the project surveyor with opportunities to provide further services to the Client. In addition, the individual circumstances and conditions of the specific project should be addressed. Where hydrographic surveys are repeated on an ongoing basis, such as for port works, care should be exercised least some aspect has change significantly, which is not taken into account by the specifications.

Certification

Hydrographic and offshore surveyors with the necessary academic qualifications, training, and work experience are encouraged to obtain internationally recognized certification through the Canadian Hydrographer Certification Scheme (CHCS) operated by the ACLS as a Certified Hydrographers (CH) and Certified Hydrographic Technicians (CHTech), as may be appropriate.

For further information, please see the ACLS website at Offshore Expertise / Canadian Hydrographer Certification Program at:

<https://www.acls-aatc.ca/offshore-expertise/canadian-hydrographer-certification-program/>.