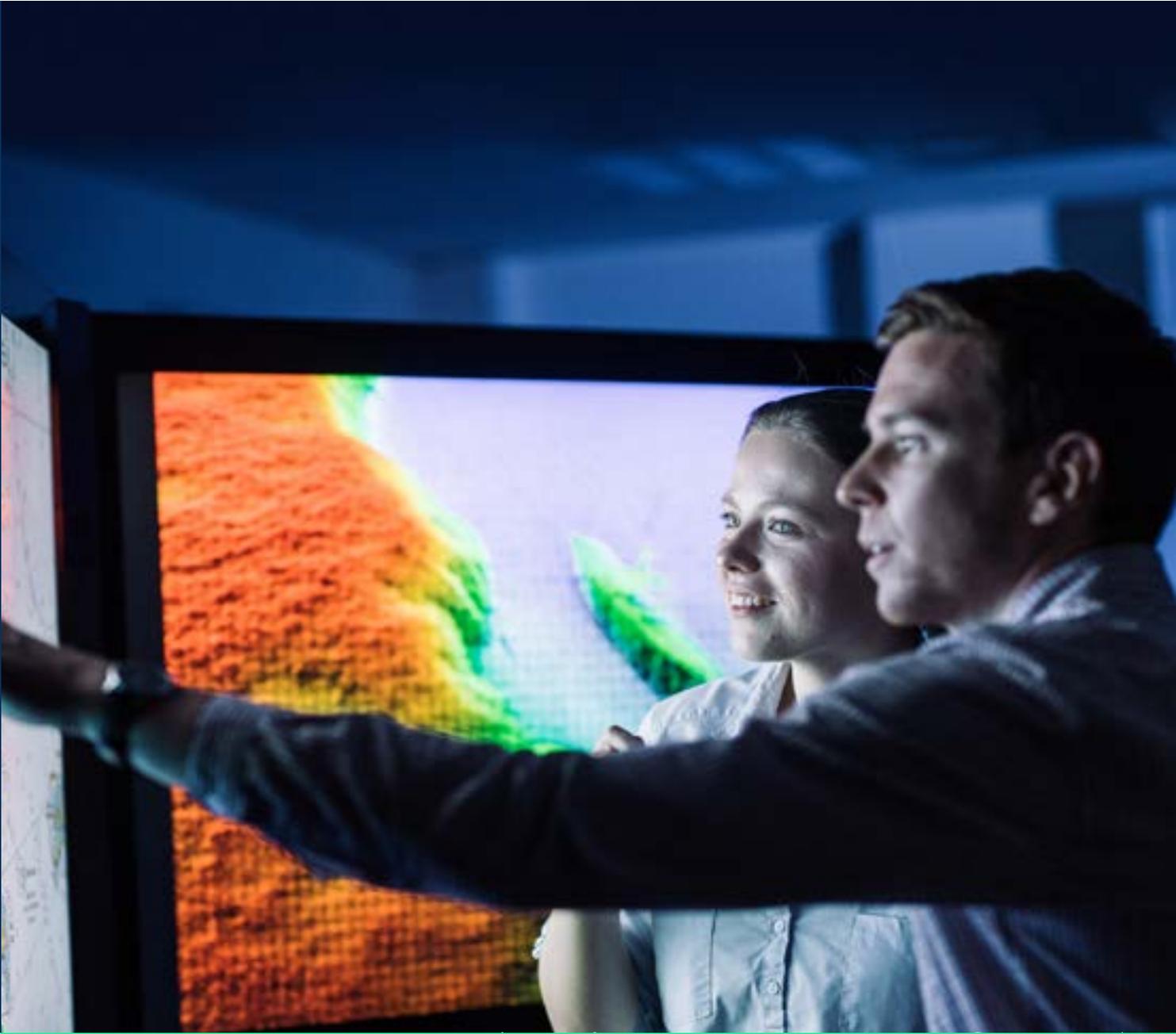


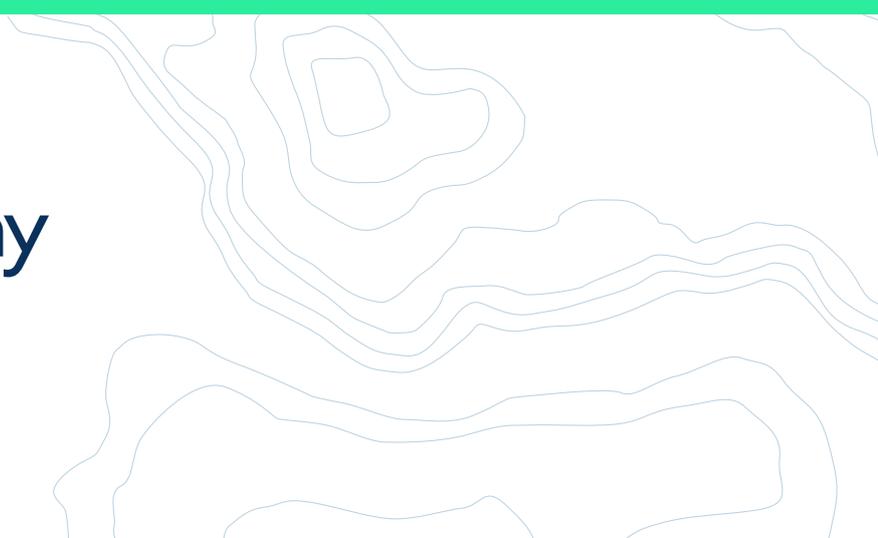


UK Hydrographic
Office

ADMIRALTY



International Training Academy





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Academic Structure

Collaboration

Working with the UKHO during a collaborative piece of work is the ideal opportunity to share knowledge, skills and experience when introducing and supporting change in your organisation.

Collaborative activity will take a deep dive into current practices, structures and business strategies, with a view to shaping, supporting and/or informing the organisations vision of the future. The UKHO leads will work alongside and within the organisations people and structures to fully understand current developments, personnel capability/capacity, and ongoing department prioritisation and commitments.

Collaboration activity encompasses stakeholder discussions ensuring the organisation direction is maintained and progress made towards the agreed strategic outcome.



Introductory level

Courses are your first entry point to a new subject area. An ideal starting point when entering a new position on the career ladder within a hydrographic or cartographic environment.

However, this entry point within the education pathway will benefit those who wish to explore a new topic area, developing an already existing skillset.

Introductory level courses will allow the delegate to develop skills through pre and post course activity, this ensures that all content delivered either online or in the selected place of learning will act as the foundation knowledge needed to progress further.



Established level

Courses are ideally suited to delegates who are either progressing from an Introductory level course or who have previous and existing experience in their current field of work, particularly the subject matter of interest.

Pre and post course activity along with the course content will be more challenging than the Introductory level, with the expectation of the delegate to recall existing knowledge to answer questions or to produce coursework.

All content delivered either online or in the selected place of learning will act as an ideal platform when progressing knowledge and skills, both practically and academically, future-proofing skills and enhancing your career progression.



Advanced level

Courses will comprise of both academic and practical activity, of which will place more challenge on the delegate.

These courses in the main are longer in duration and will require more time commitment to complete the required coursework.

Entry onto an Advanced level course will be through a robust selection process, ensuring that the level of entry is appropriate.

Advanced level courses will require the delegate to attend both online and in person lectures, leading to periods of self-study underpinned by experiential knowledge of the subject.



The UK Hydrographic Office and International Training Academy

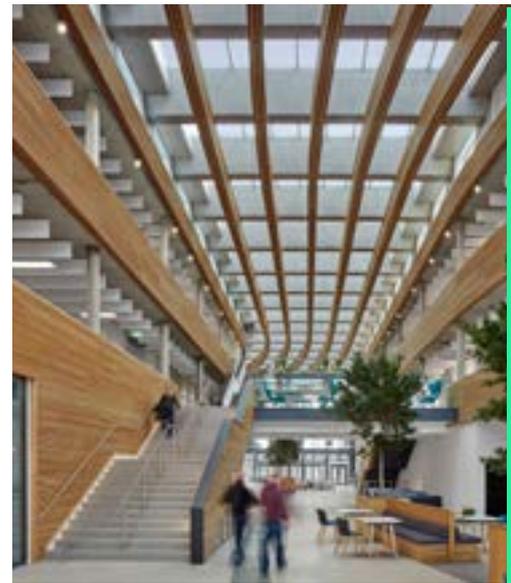
The UK Hydrographic Office (UKHO) is a world-leading centre for hydrography, specialising in marine geospatial data that helps others to unlock a deeper understanding of the world's oceans.

Working with a wide range of partners, we source, process and provide access to this data, ranging from seabed to surface. This is key to helping others make the best use of our oceans in safer, more secure and more sustainable ways.

Our International Training Academy drives forward the continuous skills and knowledge development of our global network through world-class training. We are proud of our high-quality international training programme and its alumni, who utilise their knowledge and skills every day within the blue economy to shape their decisions and to truly make the most of the world's oceans.

Our courses are of consistently high quality and recognised internationally. We continuously listen to you, our stakeholders, and ensure the way in which we design our curriculum aligns to the real-world need for continuous maritime training. As our industry changes, we ensure our courses change with it, whether it be supporting your journey through the decade of implementation, or when you join us for a short yet informative online course.

Our International Training team is the foundation of the International Training Academy. Its wealth of experience, knowledge and skills working within hydrography, cartography, education and training ensures that world-class, relevant training is delivered to you either in person or online.





Our history

1795-1800

In 1795, King George III appointed Alexander Dalrymple FRS as the first Hydrographer to the Admiralty Board (which, until 1964, was responsible for the command of the Royal Navy). Dalrymple was charged with reviewing the 'difficulties and dangers to His Majesty's fleet in the navigation of ships'.

The first 'Admiralty' chart was produced in 1800, and covered Quiberon Bay in Brittany.

1800-1825

Captain Thomas Hurd, RN, served as Hydrographer from 1808 and started selling charts to the public in 1821. He also oversaw the production of sailing directions and the first chart catalogue, and organised the first collaborative agreement with a hydrographic office from another country.

1825-1900

Other early National Hydrographers included Rear Admiral Sir Francis Beaufort, (KCB, FRS, FRGS, MRIA). Appointed in 1829 he worked until 1855, organising surveys worldwide to expand and improve chart coverage and encouraging international cooperation. Among his many accomplishments were the Beaufort Scale of wind strength and the introduction of official tide tables in 1833. By 1855, the chart catalogue listed 1,981 charts, with 64,000 copies issued to the Royal Navy. The efforts and vision of Beaufort and his predecessors meant the UKHO led the world in the techniques of hydrography and cartography.

1900's

Developments such as the echo sounder in the 1930s, and sonar in the 1960s, brought huge advances in charting the seabed. Recent technology has brought accuracy and data-handling abilities that were unimaginable only a few years ago.

Today

Today, the UKHO is a world-leading centre for hydrography, providing marine geospatial data to inform maritime decisions across the globe.

Accreditation

The UKHO has been recognised by the International Advisory Board as meeting its S-8 Standard of Competence for Nautical Cartographers - Category B. The advisory board comprises the Fédération Internationale des Géomètres (FIG), the International Hydrographic Organization (IHO), and the International Cartographic Association (ICA).

The Category B status is awarded to programmes 'which provide a practical comprehension of nautical cartography for individuals with the skills to carry out routine nautical cartographic tasks' (S-8 Third Edition Standards of Competence for Nautical Cartographers).

The UKHO also currently holds ISO9001:2015 certification, including TickIT covering IT aspects, and have had our Investor in People (IIP) status confirmed following a successful re-accreditation.

Desired level of English Proficiency

The UKHO's International Training Academy courses are delivered predominately in English. As you would expect, our course content is of a technical nature.

To engage with our courses and make the most of your time studying with us, you will be expected to have a good level of English throughout your studies. This is of benefit as we enter into open discussions both online and in person, but also required when engaging daily with the international trainers, colleagues, and everyday life in England for those visiting us from overseas.

We strongly advise delegates to be able to demonstrate an English Proficiency level of **CEFR B2** (IELTS 6.5) or higher by presenting a recent IELTS certificate with their initial application documents.

Not sure where to start?

You can check your basic English Proficiency level with the free **English Level Test by the British Council**.

Is your CEFR level below the advised level?

You can improve through a variety of options.

- We recommend preparing to take an **IELTs General Training Assessment** through the UK's most comprehensive global English language training provider, the **British Council**.
- The British Council offers several English language training courses **online, in-person, and in a group setting for your business**.

Do you require a course delivered in a language other than English?

Please contact internationaltraining@ukho.gov.uk to request course translation options.





What our delegates say



I attended the Understanding ENC's and an Introduction to S-57 course, this was delivered online via Microsoft Teams. Bespoke, convenient delivery times were established so myself and my colleagues could attend the training.

This was appreciated as we were aware the instructors delivered the session into the early hours of the morning in the UK.

They were positive and engaging as we covered the basic overview of the functions and terminology of the subjects. As a result myself and my colleagues were more familiar with the references and how and where to find them.

Meteorology-Oceanography Officer - Australia (GMT +10)



What I liked most about the course was the exchange sessions, where the trainers and trainees together had some discussions on specific questions. They were very passionate about the subject and got the trainees actively involved with the course.

Cartographer - Japan (GMT +9)



The course taught me how to create electronic and paper charts from scratch without any previous cartographic training. The Training Team were a great help and we were able to greatly benefit from their experience, and they guided us all through the training to the same pace and level.

The trainers also went with us on weekend trips, where we got to explore the UK. We were supported in every way, from travel arrangements/suggestions, to contacting the accommodation management.

Survey and Meteo Officer -Lebanon (GMT +2)



What our delegates say



Long before I arrived in the UK, the International Training staff were very helpful in providing all the information I needed, ranging from what I needed to prepare before departure, to my arrival in the UK. As a Muslim, I initially had difficulty finding halal food and the International Training staff were happy to help me get the information I needed.

The accommodation was also very comfortable and suitable for me, and the training system, delivery, and subject matter were easy to understand and apply. The Training Team provided more than enough support, and I really enjoyed field trips to increase my knowledge and experience.

Paper chart technical officer – Indonesia (GMT +7)



The training met my expectations; I felt the whole time a huge support and assistance from the Training Team. I also enjoyed field trips and the presentations from other work areas were fruitful and boosted my knowledge and performance. Accommodation was comfortable, clean, and tidy. I spent an excellent half year there.

Specialist – Poland (GMT +1)



The International Training Team was very professional and delivered way above my expectations. The support and guidance given never disappointed me. I was well taken care of; and made to feel at home and safe. I never used to see the relevance of other departments of ocean departments to cartography, but having the extra SME presentations included into the course really showed me the relevance and how to incorporate it in our work as cartographers. Amazing staff.

Assistant Nautical Cartographer and
Hydrographic Surveyor – Fiji (GMT +12)



Training Needs Analysis (1 week – In Country)



COLLABORATION

A UKHO Training Needs Analysis (TNA) is a collaborative deep dive into current training structures and business strategies, with a view to shaping and informing the organisations training vision of the future and enhancing those currently in operation. UKHO leads will work alongside and within the organisations people and structures to fully understand current practices, personnel capability/capacity, and ongoing department prioritisation, and commitments.

Stakeholder discussions, thorough analysis followed by detailed reporting of outcomes will act as the foundation for the final TNA recommendations bespoke to your organisation. Phase 5 of the TNA process will also factor in a later follow-up evaluation of the programme's implementation, ensuring direction is maintained and progress made towards the agreed strategic outcome.

5 phases of the Training

Needs Analysis:

Phase 1

Analyse – The analysis phase is a systematic deep dive into the department of interest, identifying current and future skills gaps, training resources, compliance responsibilities, existing systems and potential costs – the current picture.

Phase 2

Design – The design phase underpins the project piece by identifying the training process alongside the areas for development yet addressing this with appropriate training interventions against set objectives.

Phase 3

Develop – The development phase starts to unpack the specific 'doing' elements of the project piece; delegate activities, delivery systems, review delivery material and identify those key in achieving a successful outcome.

Phase 4

Implement – Deliver the designed material to appropriate stakeholders.

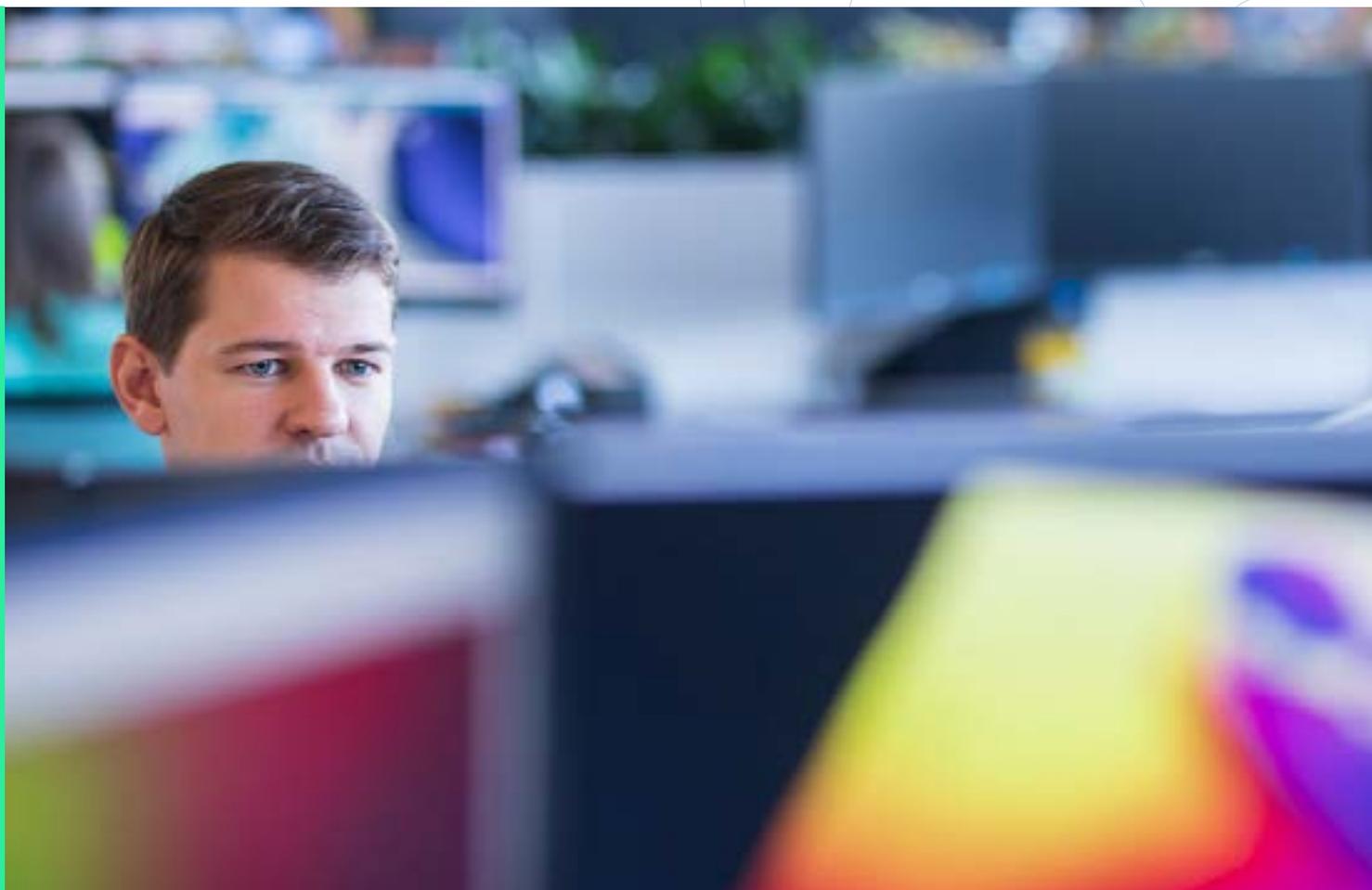
Phase 5

Evaluate – UKHO personnel evaluate the delivered project after an agreed duration of delivery.





UKHO virtual training courses



These courses are designed to raise awareness and provide an introduction to some key topics for Nautical Charting and are delivered in English language using Microsoft Teams. These sessions are also supported by further reading and learning material via our online Learning Management System (LMS).

Please contact the International Training team (internationaltraining@ukho.gov.uk) for all course availability and booking. Once in contact with the International Training team they will be able to assist you with your booking.

Course names:

- Chart Awareness
- Compiling for Navigational Safety
- Understanding Electronic Navigational Charts (ENCs)
- Introduction to S-57
- Introduction to S-100
- Principles of S-100
- Introduction to S-101
- S-101 Practical / ENC Conversion



Chart Awareness (2x Half days – Online)



INTRODUCTORY

This course is aimed at those who receive and manage the supply of hydrographic data and need a foundation awareness of hydrographic and navigational products. You will need to have a basic understanding of the content and production of paper Standard Nautical Charts (SNCs) and Electronic Navigational Charts (ENCs) but you do not carry out cartographic tasks. This knowledge will enable you to recognise the importance of hydrographic data and provide it to the relevant chart producers for your region.

Certificated by:



UK Hydrographic
Office

Subjects taught:

- The differences between paper charts, raster electronic charts and vector electronic charts
- Identifying the projections used in nautical charting
- Geographical plotting
- Navigational lights
- IALA buoyage system
- Nautical chart symbols
- Sources of information
- Methods used to keep nautical charts up-to-date





Compiling for Navigational Safety (2x Half days – Online)



INTRODUCTORY

This short online course provides an insight into the main navigational dangers that impact on mariners' navigational decision making, and the main types of Aids to Navigation that are deployed to assist mariners in making effective navigational decisions. The course also provides cartographers with guiding principles into how navigational dangers and Aids to Navigation are clearly and effectively charted. A detailed session on the principles of sounding selection and depth contour compilation is included.

Certificated by:



UK Hydrographic
Office

Subjects taught:

- Danger to navigation
- Marking of dangers using navigational buoyage
- Marking of dangers with navigational lights
- Compiling depth information safely





Understanding Electronic Navigational Charts (ENCs) (Half day – Online)



INTRODUCTORY

This course is aimed at nautical cartographers and users of paper products that have none or very limited knowledge of Electronic Navigational Charts (ENCs). It is designed to raise awareness and to help appreciate how ENCs benefit the mariner and also to consider some of the disadvantages. Delegates will gain a basic understanding of ENCs, how they are produced and distributed and how they are used by the mariner.

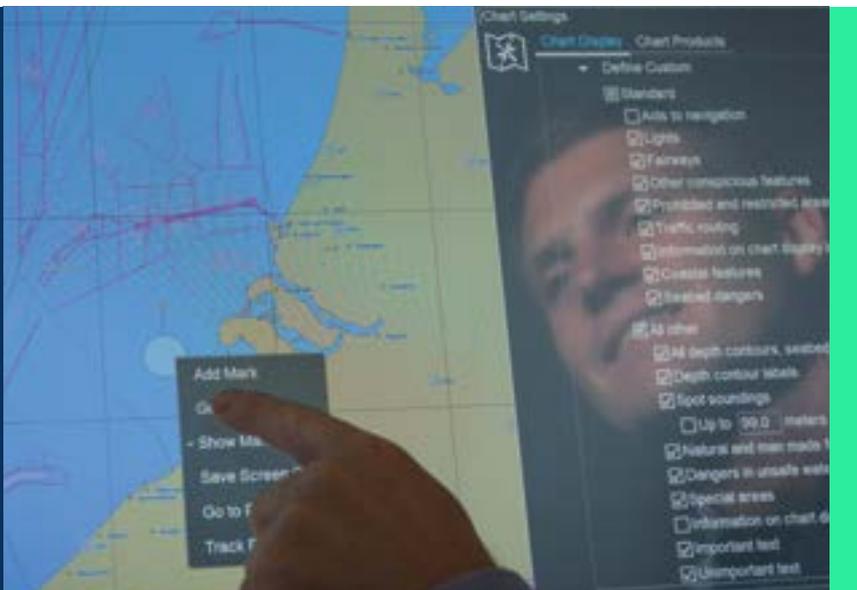
Certificated by:



UK Hydrographic
Office

Subjects taught:

- Introduction to the S-57 Data Model
- Navigational purpose and ENC scheming
- Structure of ENCs and S-52 Display Standard
- ECDIS use and customisation
- ENC production and distribution (S-65)
- Limitations of ENC for the Mariner





Introduction to S-57 (Half day – Online)



INTRODUCTORY

This short online course provides an introduction to the IHO S-57 Data Exchange Standard, which is used to capture and encode digital data in the required format for Electronic Navigational Charts (ENCs). S-57 is also increasingly used by hydrographic offices to encode data for use in geospatial databases and for paper chart production. This course is aimed at nautical cartographers and geospatial operators inexperienced in S-57 data capture for ENCs, databases and when producing paper charts from S-57 data.

Certificated by:



UK Hydrographic
Office

Subjects taught:

- S-57 Development
- S-57 Document Structure
- S-57 ENC in ECDIS
- S-57 Theoretical Data Model
- Spatial Objects
- Object & Attribute Catalogues
- S-4 Chart Specifications of the IHO
- Group I Polygons
- LNDARE
- Coastline - COALNE / SLCONS
- Height of the Coastline
- Depth Areas
- Soundings
- Light Descriptions
- CARIS Source Editor
- SCAMIN
- Meta Objects
- CARIS - S-58 Validations





Principles of S-100 (Half day – Online)



INTRODUCTORY

This half day online course is aimed at potential delegates who wish to explore the principles of the S-100 Universal Hydrographic Data Model.

This lesson makes the S-100 standard easy to understand as technical details are broken down and technical language is minimised whilst big-picture concepts are made clear to maximise learning.

The lesson will benefit delegates of any background and technical skill as it is the ideal starting point to develop knowledge and understanding of the future of maritime cartography.

The online course will be delivered via Microsoft Teams, using a PowerPoint presentation to share information, fill in knowledge gaps and promote understanding.

Certificated by:



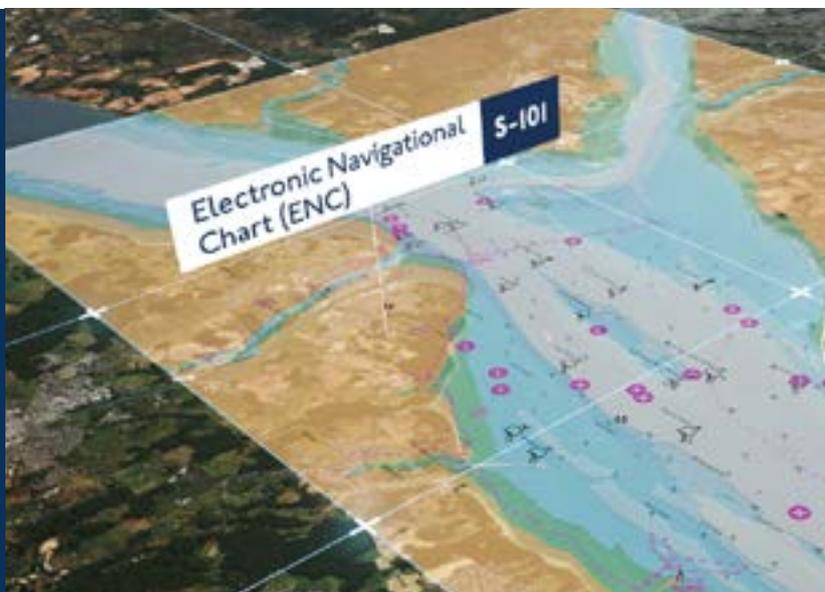
UK Hydrographic
Office

Subjects taught:

- What is S-100?
- Why develop S-100?
- What are the benefits of S-100?
- How will S-100 be implemented?
- What S-1XX standards exist?
- When will S-100 be ready?

Phase I layers:

- S-101
- S-102
- S-104
- S-111
- S-124
- S-129





Introduction to S-101 (Half day – Online)



S-101 will soon succeed S-57 as the primary ENC Data Exchange Standard and therefore the reference standard for the cartographic compilation of navigational data to be used in Electronic Navigational Charts (ENCs).

S-101 has the potential to be used by National Hydrographic Offices (NHOs) to encode data for use in geospatial databases to be published as ENCs and input to Paper Charts, it makes up the leading section of the S-100 Universal Hydrographic Data Model (UHDM), will enhance the ability for NHOs to meet Safety Of Lives At Sea obligations and provides mariners with a streamlined ENC for more efficient navigation.

Students will be introduced to new concepts and provided with an understanding of the new IHO S-101 Data Exchange Standard as compared to S-57, and the role of S-101 within the S-100 UHDM.

This short theory lesson builds upon the learning introduced in the Introduction to S-57 and Compiling for Navigational Safety lessons and is designed to supplement the Principles of S-100 lesson which should be taken prior to this lesson.

To best benefit from these lessons students should have some experience with data capture in S-57.

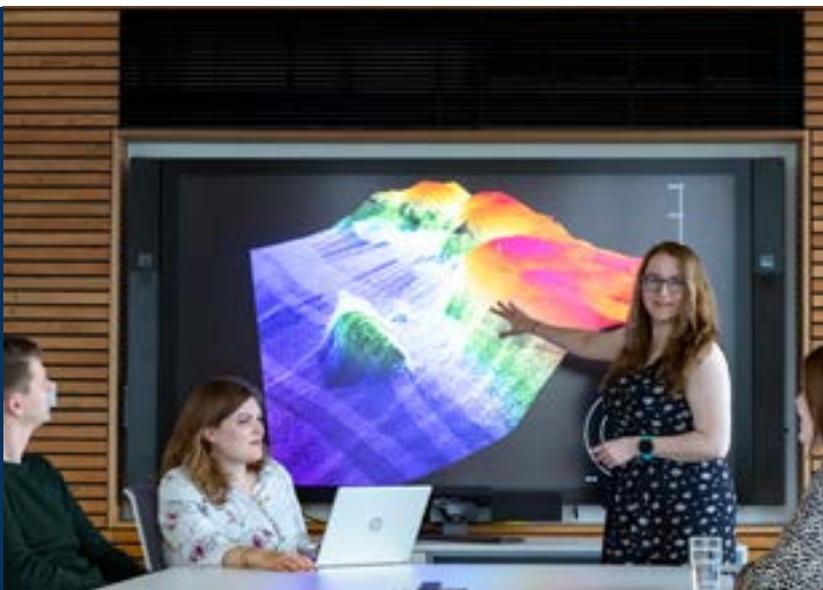
Certificated by:



UK Hydrographic
Office

Subjects taught:

- S-101 Overview
- S-101 Development
- S-101 Document Structure
- S-101 Naming Conventions
- Data Classification and Encoding Guidance for:
 - Group one objects
 - Land and shoreline constructions
 - Ocean features (soundings, depth features and obstructions)
 - Aids to navigation (lights, buoys and beacons)
- Meta Objects
- Scale Minimum (SCAMIN) and display
- Theory of automated conversion





S-101 Practical / ENC Conversion (Multi-day – Online)



S-57 continues to be the leading Data Exchange Standard across the Blue Economy and despite limitations will continue to be used throughout the decade, as National Hydrographic Offices across the globe transition to 'Dual Fuel' Electronic Navigational Chart (ENC) production. Over this period S-101 will surpass S-57 as the primary Data Exchange Standard. National Hydrographic Offices (NHOs) will first need to know how to prepare their S-57 datasets for conversion, then convert S-57 datasets and databases to S-101 before performing dual fuel and potentially triple fuel chart productions.

This course entails a blend of theory and practice to build upon the skillset of experienced Cartographers.

Practical lessons will be delivered remotely using the UKHO's renowned cloud-based Specialist Training for Online and Remote Members training platform. Here students will develop hands-on experience with S-101 data using CARIS software in a range of scenarios alongside data-improvement sessions aimed at preparing S-57 data for precise conversion.

Theory sessions will be used throughout to bolster student knowledge and understanding of S-101 through comparison to the existing S-57 standard. This includes sections outlining the current limitations, advancements and general changes to ENC compilation from a Cartographers perspective. In addition, improvements to the mariner will be highlighted through a demonstration of changes to how ENCs display and interact based on a Mariner's Selected Viewing Scale.

Students will experience the steps involved in the creation of S-101 datasets and products.

This course establishes upon the learning introduced in the Introduction to S-57, Compiling for Navigational Safety and Introduction to S-100 courses. Students must have experience with best practice data capture in S-57 as well as a working knowledge of S-100.

Certificated by:



UK Hydrographic
Office

Subjects taught:

- Principles of S-101
- S-101 data compilation
- S-57 data preparation
- Dataset conversion:
 - S-57 to S-101
 - S-101 to S-57
- Conversion error resolution
- Comparing S-57 and S-101 objects:
 - Group I Objects
 - Deprecated features
 - New features
 - Feature collections
- Rules of Geometry
- S-101 attribution:
 - Complex attributes
 - Sub-attributes
 - Mandatory attributes
 - Attribute format types
- Verifying dual fuel data parity
- Validating S-101 data
- Data display changes
- Verifying dual fuel data parity
- Validating S-101 data
- Data display changes
- Dual fuel dataset exports:
 - Publishing ENCs
 - Maintaining ENCs

UKHO in-person training courses



In-person training may be offered at our Taunton Headquarters by prior arrangement and subject to availability within the International Training Academy.

Course names:

- Foundation course
- Phase One Skills
- ENC Production
- Product Construction
- ENC Compilation
- Compilation Generalisation
- Data Assessment
- Geospatial Marine Analysis and Cartography (GeoMAC) Programme 'CAT B'



Foundation course

(3 weeks – UKHO or 2 weeks – In Country)



This highly practical course is designed for those who will undertake basic cartographic tasks. It introduces the underlying principles of marine cartography, covering charting fundamentals such as the content, structure and standards of nautical charts and publications. It is aimed at those who aspire to become marine cartographers, as well as established cartographers who want to gain further understanding of marine cartography. The course provides the basic information required to undertake the Geospatial Marine Analysis and Cartography (GeoMAC) Programme 'CAT B'.

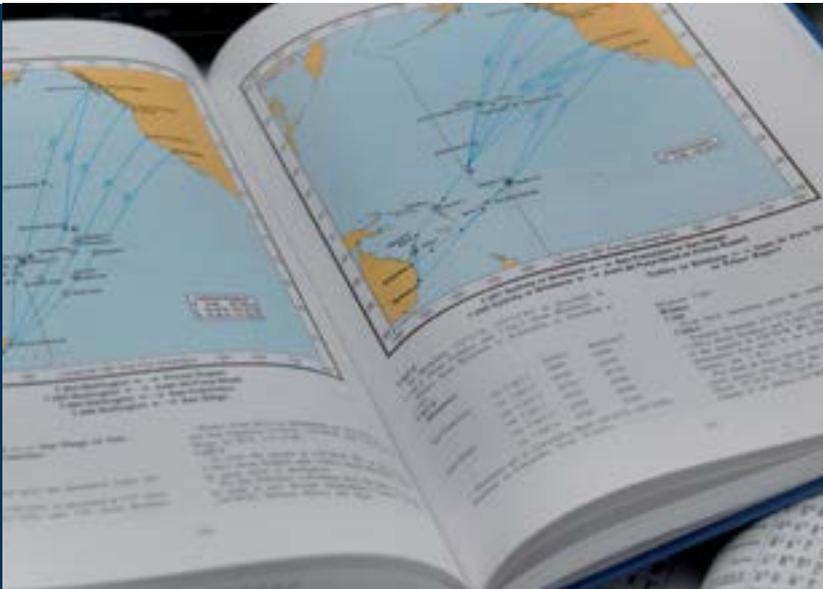
Certificated by:



UK Hydrographic
Office

Subjects taught:

- Geodetic principles including projections and datums
- Geographical plotting
- Types of nautical charts and publications
- Processing bathymetric data
- Principles of depth sounding selection
- Navigational aids
- IALA Buoyage System
- Generalisation
- Symbols used on charts (Chart symbology)
- Navigational dangers
- Chart design and layout
- Compilation source information
- Tides
- Topography





Data Compilation

(3 weeks – Delivery options available)



INTRODUCTORY



ESTABLISHED

This course provides an introduction to the role, purpose, production, maintenance and validation of Electronic Navigational Charts (ENCs). In this course, the participant will gain a full understanding of the standards required to produce these charts. It is a highly practical course, with participants required to produce an ENC with updates and then maintain it by New Edition. This course will be delivered using CARIS software.

Certificated by:



UK Hydrographic
Office

Subjects taught:

- International standards
- ENCs and ECDIS regulations
- ENC data capture
- ENC updates
- ENC validation
- ENC maintenance

Compilation Generalisation

(1 week – Delivery options available)



ESTABLISHED

This course provides an in-depth look at the purpose and principles of generalisation when compiling nautical charts. The participant will develop an understanding of the levels of charted depiction at differing scales, the generalisation processes and how these can be applied effectively. The course includes a practical element with the focus on sounding selection criteria, using CARIS software.

Certificated by:



UK Hydrographic
Office

Subjects taught:

- Purpose of generalisation
- Principles of generalisation
- Levels of charted depiction
- Generalisation processes
- Sounding selection



Product Construction

(3 weeks – In Country)



ESTABLISHED

This three-week course conducted in the classroom is for delegates to first understand the principles, and then to design and produce a Standard Navigational Chart (SNC) and an Electronic Navigational Chart (ENC) from a pre-populated database.

The course will be delivered using CARIS S-57 Composer, CARIS Paper Chart Composer and using a PowerPoint presentation. There is a blend of instructor-led demonstration with much of the course based on delegates working through an assessed exercise.

Certificated by:



UK Hydrographic
Office

Paper Chart Production

Subjects taught:

- Production overview
- Quality – Introduction to standards and policy documents
- Intellectual Property Rights
- Raster Chart
- Principles of Cartographic Generalisation
- Verification
- Lithographic/Print on Demand (POD) Printing and Distribution
- Compilation and Publication Procedures

ENC Production

Subjects taught:

- Exchange Set
- S-58 Validation
- ENC consistency and encoding issues
- ECDIS
- S-65 Data Encryption
- Regional ENC Coordinating Centre (RENCs) and Value-Added Resellers (VARs)
- Paper Chart and ENC Scheming
- Future Standards (S-101)





Data Assessment

(3 weeks – Delivery options available)



Data assessment and product maintenance are essential tasks in hydrography and nautical cartography. Data assessment involves evaluating and processing new information for accuracy and relevance, using both GIS software and traditional checking processes. Product maintenance involves updating hydrographic products, such as Electronic Navigational Charts (ENC) and Paper Charts, to reflect changes in the marine environment, as well as the production and dissemination of Notice to Mariners (NTM).

Attendees will also apply their skills in a range of assessed practical activities. Delivered by experienced trainers and subject matter experts, the course will provide comprehensive coverage of the topics on the right.

Data assessment is a complex process that uses GIS software, traditional checking processes, and expert judgment. Product maintenance uses Notice to Mariners (NTMs), new edition maintenance, and bilateral arrangements. NTMs disseminate information about changes to the marine environment, while new edition maintenance updates hydrographic products to reflect changes identified through data assessment. Bilateral arrangements are agreements between hydrographic offices to share data and information.

Hydrographic offices are responsible for acquiring source material, identifying navigational dangers, investigating marine accidents, complying with marine law and product liability requirements, entering bilateral arrangements, maintaining ADMIRALTY products, disseminating Maritime Safety Information (MSI) through NTMs, examining incoming data, preparing NTMs, updating ENCs, and managing bilateral arrangements.

By carefully assessing new information and updating hydrographic products, hydrographic offices can help to prevent accidents and keep mariners safe.

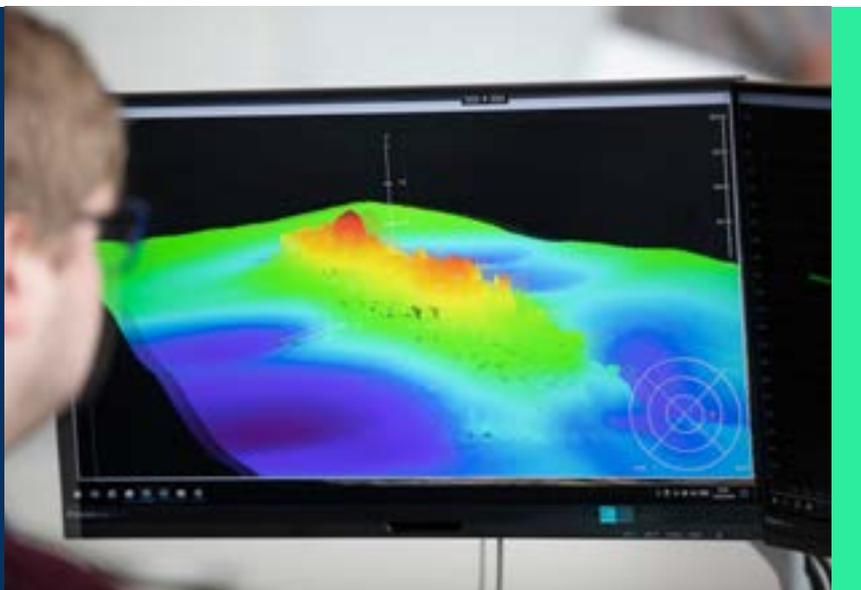
Subjects taught:

- Acquiring source material, such as bathymetric data, nautical charts, and navigational aids
- Identifying navigational dangers
- Investigating marine accidents
- Complying with marine law and product liability requirements
- Understanding bilateral arrangements with other hydrographic offices
- Maintaining ADMIRALTY products, such as nautical charts and electronic navigational charts (ENCs)
- Disseminating Maritime Safety Information (MSI) through NTMs
- Examining incoming data to ensure its accuracy and relevance
- Updating ENCs to reflect changes to the marine environment

Certificated by:



UK Hydrographic
Office



Geospatial Marine Analysis and Cartography (GeoMAC) Programme 'CAT B' (21 weeks – Delivery options available)



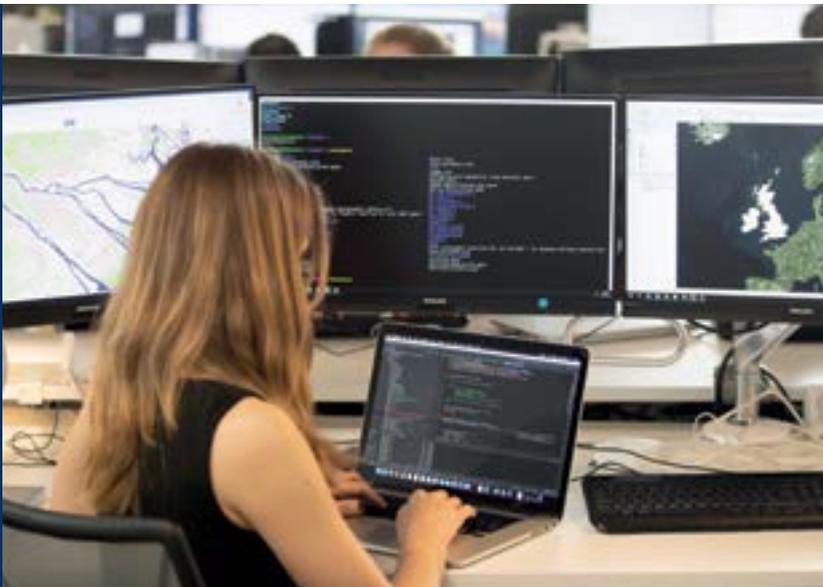
The aim of this course is to provide a practical understanding of nautical cartography and the skills and techniques needed to carry out routine nautical cartographic tasks. It includes processing hydrographic data into a published form. The course is highly practical, providing a detailed understanding of the compilation and production of paper and electronic charts using CARIS software. This course is predominately carried out at the UK Hydrographic Office, with elements that can be completed in your own country.

Accredited by:



Modules taught:

- Fundamentals of Charting
- Geospatial Fundamentals
- Compilation
- Geospatial Concepts (mini module)
- Product Construction
- Hydrography and Special Purpose Charting (mini module)
- Data Assessment and Product Maintenance





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