UK Hydrographic Office

Notes Before Completing the Application

We have read and understood the notes concerning our application submission.

True

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:

CORE TRUSTWORTHY DATA REPOSITORIES REQUIREMENTS

Background & General Guidance

Glossary of Terms

BACKGROUND INFORMATION

Context

R0. Please provide context for your repository.

Repository Type. Select all relevant types from:

Domain or subject-based repository, National repository system; including governmental, Archive

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Brief Description of Repository

UK Hydrographic Office Bathymetry Data Archive Centre (UKHO DAC) is the UK national repository for bathymetry data. It is provided by the UK Hydrographic Office (UKHO) as part of the wider Marine Environmental Data and Information Network (MEDIN) [1]. The UKHO is part of the Ministry of Defence.
The UKHO DAC holds bathymetry data assets from a wide range of sources – Government funded, commercial, environmental and defence.

[1] https://www.medin.org.uk

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Brief Description of the Repository's Designated Community.

The designated community for the UKHO DAC consists of a wide range of users of bathymetry data and the related surfaces. Primary use of the data held is in support of SOLAS (Safety of Life at Sea). Users are typically within academia, local authority organisations, and industry – including the hydrocarbon industry, environmental consultants, as well as the geotechnical and site investigation sector.

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Level of Curation Performed. Select all relevant types from:

A. Content distributed as deposited, B. Basic curation – e.g. brief checking; addition of basic metadata or documentation, C. Enhanced curation – e.g. conversion to new formats; enhancement of documentation, D. Data-level curation – as in C above; but with additional editing of deposited data for accuracy

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept

Comments

A. Content distributed as deposited.
B. Basic curation – e.g. brief checking; addition of basic metadata or documentation.
C. Enhanced curation – e.g. conversion to new formats; enhancement of documentation.
D. Data-level curation – as in C above; but with additional editing of deposited data for accuracy.

D1. All bathymetric data received at the UKHO undergoes quality assurance and assessment against navigational products for possible SOLAS action.
D2. Civil and Defence Hydrography Programme (CHP and DHP) surveys are quality assured to an agreed standard (IHO S-44).
D3. All other bathymetric data received are assured as far as possible given the information provided and assessed against navigational products for possible SOLAS action. Where practical, queries are raised with the supplying authority. Where data quality is doubtful, surveys and soundings are tagged appropriately.
D4. UKHO has standards, policies, and procedures in place for the acquisition, storage, metadata, quality assurance, use, re-use and licensing of bathymetric and other marine data.
D5. The UKHO is an accredited ISO 9001:2008 organisation.
D6. In the first instance, the UKHO DAC will concentrate on bathymetry and bathymetric surveys.
D7. Bathymetric surveys can be rendered in a wide variety of formats each requiring differing Quality Assurance processes. The UKHO has documented existing procedures for commonly received surveys (modifying and developing these as necessary) as internal document “QP506 Validation and Appraisal of Bathymetric Surveys – Depth Data”.

D8. The basic stages are:
a. Items are checked against the original inventory.
b. Data files are read and checked for format, content, and range of values.
c. Navigation data are checked for completeness and consistency.
d. Depth data are modelled in 3D and checked for completeness and consistency.

e. Depth data are compared to existing data in the locality to check for comparative consistency.

f. Data is archived in its original format, the Generic Sensor Format (GSF Specification, v3.04, US Naval Oceanographic Office, 08 June 2012) and the proprietary CARIS Bathy DataBASE format.

Reviewer Entry

Reviewer 1

Comments:
Excellent curation on the data level

Reviewer 2

Comments:
Accept

Insource/Outsource Partners. If applicable, please list them.

Marine Environmental Data and Information Network (MEDIN) https://medin.org.uk/

Reviewer Entry

Reviewer 1

Comments:
https://medin.org.uk/

Reviewer 2

Comments:
Accept

Summary of Significant Changes Since Last Application (if applicable).

Minor changes throughout resubmission in response to Reviewer and Board comments, with significant changes within Section R10 on Preservation Planning.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:
Accept

Other Relevant Information.

Reviewer Entry

Reviewer 1

Comments:

Reviewer 2

Comments:
N/A

ORGANIZATIONAL INFRASTRUCTURE

1. Mission/Scope

R1. The repository has an explicit mission to provide access to and preserve data in its domain.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Response:

As a Public Authority, the UK Hydrographic Office makes relevant data sets available under the Open Government Licence in compliance with the ‘Infrastructure for Spatial Information in Europe (INSPIRE) initiative [2].

The ADMIRALTY Marine Data Portal from UKHO provides access to marine data sets held by the UK Hydrographic Office within the UK Exclusive Economic Zone (EEZ). The ADMIRALTY Marine Data Portal enables users to search and download data sets regarding maritime limits and boundaries, ships’ routeing measures, bathymetry and more [3].

We have been accredited by the Marine Environmental Data and Information Network (MEDIN) as the National Data Archive Centre for bathymetric surveys [4]. Therefore, we have included access to relevant bathymetric surveys held in our Data Archive Centre as part of our ADMIRALTY Marine Data Portal [5].

The Marine Environmental Data and Information Network (MEDIN) promotes sharing of, and improved access to, these data. It is an open partnership, and its partners represent government departments, research institutions and private

companies [6]. As part of MEDIN, UKHO publishes its mission to hold and make accessible “all UK Government sponsored survey data gathered in support of charting around the British Isles [4]”.

Data stored at UKHO is used by numerous engineering and environmental organisations. The most common are wind farm developers, who use the data to assist their planning for the positioning of the turbines and to form the base layer in environmental impact studies. Other uses have included academic use by students and coastal monitoring organisations.

[2] https://www.gov.uk/government/organisations/uk-hydrographic-office/about
[3] https://www.admiralty.co.uk/digital-services/data-solutions/admiralty-marine-data-portal
[4] https://www.medin.org.uk/data-archive-centres
[5] https://www.gov.uk/guidance/inspire-portal-and-medin-bathymetry-data-archive-centre
[6] https://www.medin.org.uk/about

Reviewer Entry

Reviewer 1

Comments:
Accept

Reviewer 2

Comments:
Accept
The mission described in the response is clear and closely tied to preserving and providing access to data.

2. Licenses

R2. The repository maintains all applicable licenses covering data access and use and monitors compliance.

Compliance Level:

3 – The repository is in the implementation phase

Reviewer Entry

Reviewer 1

Comments:
3 – The repository is in the implementation phase

Reviewer 2

Comments:
3 – The repository is in the implementation phase

Response:

The UKHO Data Archiving Centre (DAC) complies with UKHO Licensing Policy [7] that describes the conditions of use, along with the different charging and licensing arrangements applied for data and information. The charges levied are compliant with UK Government legislation and guidance, and links to relevant documents are included in the policy.

The UKHO Intellectual Property (IP) webpage [8] provides an advisory and licensing service for the reproduction of UKHO copyright material. UKHO intends to increase visibility of its licensing terms to support existing information around acquiring or purchasing UKHO data during 2022.

To encourage the use and re-use of bathymetry data the UKHO makes bathymetry data sets freely available wherever possible via the ADMIRALTY Marine Data Portal (MDP) [9].

Bathymetry data sets released on the MDP are governed by an Open Government License [10] with the following two additional terms:

(a) The data sets are not suitable for use in marine navigation or in the creation navigational products.
(b) If you reuse any of the data, you must acknowledge the source by including the following attribution statement "Contains public sector information licensed under the Open Government Licence v3.0, from the [the Owner/Originator of the data as indicated in the metadata]."

UKHO DAC data is also included in the range of charts and publications that support global safe maritime navigation [11]. These products are protected by the UKHO Licensing Policy, Crown copyright where applicable and digital product licensing mechanisms such as the International Hydrographic Organization (IHO) S-63 Data Protection Scheme [12].

Data is generally only made available under OGL where permissions exist. Where they do not exist, due to security or 3rd party IPR constraints, data is still archived but not made available externally without the express consent of the supplier.

[7] http://www.ukho.gov.uk/copyright/index.aspx#Licensingpolicy
[8] http://www.ukho.gov.uk/copyright/aboutus.aspx
[9] https://datahub.admiralty.co.uk
[10] http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/
[11] http://www.admiralty.co.uk
[12]
https://iho.int/uploads/user/Services%20and%20Standards/ENC_ECDIS/data_protection/S-63_e1.2.0_EN_Jan2015.pdf

Reviewer Entry

Reviewer 1

Comments:
Accept
Licenses are clearly described.

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC's on-going and future efforts of adopting, maintaining, and publicizing relevant data licenses, including the Open Government License.

3. Continuity of access

R3. The repository has a continuity plan to ensure ongoing access to and preservation of its holdings.

Compliance Level:

3 – The repository is in the implementation phase

Reviewer Entry

Reviewer 1

Comments:
3 – The repository is in the implementation phase

Reviewer 2

Comments:
3 – The repository is in the implementation phase

Response:

The UKHO DAC is implemented as an integral part of the UKHO infrastructure. To comply with best practice and industry standards, data assets are backed up and archived according to stated policies that are implemented by UKHO Technology Operations. Archived data is replicated between two systems to ensure continuity of access – an off-site data centre for geographic redundancy and Microsoft Azure for Cloud-based resilience.

UKHO DAC data assets are held within and are accessible from wider UKHO infrastructure and, as a result, their future continuity is determined by that of the organisation.

The UKHO does not have a formal 'long-term' stewardship plan which covers the transfer of the data holdings to another archive centre at some point in the future. Specific individual data retention agreements exist in respect of Maritime and Coastguard Agency (MCA) and Royal Navy (RN) data holdings and similar agreements will be made at the request of any data owner.

The UKHO is a Place of Deposit under The Public Records Act 1958 [13]. Aspects of data retention are also covered by several other Acts of Parliament that are being reviewed with the intention of modernising relevant legislation [14]. The UKHO would be covered by such initiatives.

Explicit planning to the continuity of UKHO is made in the confidentially supplied UKHO Framework Document (to be published during 2022) that outlines the purpose of UKHO, corporate governance structures, risk management boards, Parliamentary accountability, Ministerial responsibilities, plus applicable Acts of Legislation or Government directives.

Further reference is also made within the UKHO Annual Report 2020/21, which is published online and approved by the Comptroller and Auditor General to the Houses of Parliament [15]. Specific reference to seabed mapping is made on page 21, with the latest information on strategic risks, sustainability, governance, and performance, both financially and operationally, within the main body of this report.

If at some time in the future the UKHO is not required to fulfil this role or is disbanded, an appropriate plan will be developed to ensure that the data and metadata are transferred. This will include notifying the original donor and giving them the opportunity to reclaim the data.

All data held in the UKHO DAC is described using appropriate INSPIRE/UK government (UK GEMINI) compliant metadata [16]. All DAC data is accessible and searchable in metadata catalogues internally and externally releasable data is available via the ADMIRALTY Marine Data portal web site [17] and harvested by metadata aggregator sites MEDIN and Data.Gov.UK.

INSPIRE = Infrastructure for Spatial Information in the European Community
UK GEMINI = GEo-spatial Metadata INteroperability Initiative
MEDIN = Marine Environmental Data and Information Network

[13] https://www.nationalarchives.gov.uk/information-management/legislation/public-records-act/
[14] https://www.nationalarchives.gov.uk/information-management/legislation/
[15] https://www.gov.uk/government/publications/uk-hydrographic-office-2020-2021-annual-report-released
[16] https://guidance.data.gov.uk/publish_and_manage_data/harvest_or_add_data/harvest_data/gemini/
[17] https://datahub.admiralty.co.uk

Reviewer Entry

Reviewer 1

Comments:
Accept
Continuity of the institution is credible; an explicite plan is to be published in 2022

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC’s efforts to ensure continuity of access to their data holdings.

4. Confidentiality/Ethics

R4. The repository ensures, to the extent possible, that data are created, curated, accessed, and used in compliance with disciplinary and ethical norms.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Response:

Supporting front-end assurance efforts, the UKHO has rigorous processes in place for the ingestion of geospatial data into our repository. Guided by our published UKHO Data Principles, we use customer relationship management systems (Microsoft Dynamics 365) to robustly track and associate supplier information with their datasets. This ensures that IPR considerations, constraints and privacy considerations are explicitly linked and not separated from the underlying data, thus reducing the risk of governance lapses with respect to disclosure risk.

Our UKHO Data Principles are top-level management approved guidelines to ensure that the handling of our data and the Best Practice behaviours of those responsible for data, meet organizational norms and expectations. These include the safeguarding of data via the following four sub-principles:

“One way in and one way out”
Having one channel for incoming and outgoing data reduces technological and administrative complexity, resulting in responsive offerings and reduced overheads. Customers and data suppliers will have a clear understanding of how to provide and access our datasets. Coordination will likewise be enhanced if standards are maintained to a common scheme.

“We own and protect data”
Data will have an owner responsible for the application of the data principles to that data and its associated metadata. The owner will monitor the veracity, quality, protection, and value for money of that data. Data will be protected against corruption, illegal access, and unavailability.

“We manage the data lifecycle”

Accurate record-keeping of all changes made to a dataset, including timestamping and the originator of the change, will ensure transparency for assurance or compliance purposes. An external regulator or the original data provider may wish to audit, informally or otherwise, what actions have been carried out on the data and hence transparency will both mitigate corporate risks and enhance commercial relationships or trust.

“We record data lineage”
Further to capturing a snapshot of received data 'as-is' for technical traceability, its lineage must also be comprehensively recorded for due diligence purposes. Maintaining an accurate and complete record of data lineage from source is key to ensuring that we have the onward confidence and comfort to exploit the data in products and services.

(For completeness here, the three other major Data Principles are that Data is Valued, Easy to Use and is Fit for Purpose, each with several sub-principles and explanatory text.)

To ensure alignment with wider HM Government, the Data Ethics Framework as published by the Department of Digital, Culture, Media & Sport (DCMS); forms the basis of ethical consideration and decision making for our wider Data Release process [18,19]. This Data Ethics Framework guides the design of appropriate data use and release within HM Government. It explicitly builds upon the values in the Civil Service Code – integrity, honesty, objectivity, and impartiality – to encourage ethical design of data services. Our Data Governance Working Group is empowered and encouraged to add aspects particular to any given project but cannot knowingly deviate from this nationally published standard. (Evidence of the Data Ethics Framework as used by UKHO has been provided with this submission.)

Our Data Release process is an agreed organization-wide methodology for ensuring that all officially published data meets UKHO expectations for fitness-of-purpose and the protection of personal confidentiality or National Security interests as applicable. It also supports our endorsement and adoption of the UN-GGIM (United Nations Global Geospatial Information Management) IGIF (Integrated Geospatial Information Framework), as part of UKHO strategy in support of UK Government objectives.

For release of a given dataset, the following 8 aspects must be unanimously agreed by all stakeholders of our Data Governance Steering Group, which encompasses key stakeholder interests throughout the organization. These aspects are as follows:

Personal data, legal challenge (incl. IPR), National Security interest, competition law, prior licensing considerations, damage to commercial interests of data suppliers, dataset quality caveats, and other substantive risks associated with data release. These aspects are encapsulated within Acts of Parliament including the Data Protection Acts (DPA) 1998/2018, Freedom of Information Act (FOIA) 2000 and the Public Records Acts (PRA) 1958/1967 among others.

It should be noted that a substantial proportion of our bathymetry data is collected via third party contracts. This is governed through an MoU with the MCA and an MoU, contract, or agreement with the relevant Port Authority. UKHO does not directly control the contractors in the field, although UKHO supplies specifications to the MCA for the data collection

and can provide technical advice to Ports upon request.

[18] https://www.gov.uk/government/publications/data-ethics-framework/data-ethics-framework

[19] https://www.gov.uk/government/publications/data-ethics-workbook

Reviewer Entry

Reviewer 1

Comments:
Accept
UKHO Data Principles correspond to the level of curation. For general aspects, the data ethics framework of GOV.UK is adopted.

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC's efforts to ensure that data are created, curated, accessed, and used in compliance with disciplinary and ethical norms through following the UKHO Data Principles (supplied as Supporting Evidence).

5. Organizational infrastructure

R5. The repository has adequate funding and sufficient numbers of qualified staff managed through a clear system of governance to effectively carry out the mission.

Compliance Level:

3 – The repository is in the implementation phase

Reviewer Entry

Reviewer 1

Comments:
3 – The repository is in the implementation phase

Reviewer 2

Comments:
3 – The repository is in the implementation phase

Response:

Since its founding in 1795, the UKHO as part of the Ministry of Defence has been globally supplying its ADMIRALTY hydrographic and geospatial charts. As the UK Government's recognised expert in areas such as bathymetry, oceanography, and geodesy data; UKHO is also listed as the UK experts for Law of the Sea at the UN and IHO. UKHO

has primary responsibility for the Exclusive Economic Zone(s) of the United Kingdom, Overseas Territories and Crown Dependencies, plus coverage of global regions under agreements with those respective sovereign States.

The UKHO Bathymetric Database currently contains over 11,500 surveys covering approximately 139,800 M^2, of which 9,776 surveys fall within the United Kingdom and Ireland. Of these surveys, the UKHO hosts 5,900 surveys that are legally releasable and available on the Bathymetric DAC. These releasable surveys cover 118,939 M^2 that correspond to 34% of the UK Exclusive Economic Zone.

UKHO has acted as the Bathymetry DAC for over 10 years and has sustained a continued level of commitment to this as it closely aligns with our core organisational mission. Making this archive of data accessible to a wide audience is a key part of our ongoing strategy [20]. This combined with our organisational stability and past public record, ensures that we continue to dedicate SQEP (Suitably Qualified and Experienced Persons) staff to this requirement.

By compliance with MEDIN we also comply with GEMINI, INSPIRE and ISO 19115 by default. We adhere to International Hydrographic Organisation (IHO) standards S-4, S-52, S-57, S-58, S-63 that are now evolving into the S-100 set of standards.

The UKHO has a variety of non-binding Memoranda of Understandings (MoUs) with other HMG Agencies, Departments, Crown Dependencies and Overseas Territories to receive, hold and use supplied data, as well as supplying to 3rd parties for reproduction. The largest example is an MoU with the MCA who head the Civil Hydrography Programme (CHP). The focus of MoUs is SOLAS, but this is evolving to meet emerging needs for maritime data services. Contractual obligations for Law of the Sea data for the Ministry of Defence (MoD), Foreign and Commonwealth Office (FCO), Association of Chief Police Officers (ACPO) and several Sovereign States.

The 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. We are a trading fund of the MoD and employ circa 850 people based in Taunton, Somerset. Our public task defines those things that UKHO is required to do by statute or common administrative practice [21].

Our market-leading portfolio of ADMIRALTY Maritime Data Solutions is found on over 90% of the world’s ships trading internationally and provides the widest official coverage of the world’s busiest international shipping routes and ports.

As part of UK Government, we are responsible for:

■ Providing operational support to the Royal Navy and other Defence customers by providing hydrographic services.
■ Servicing wider government by supporting the Maritime & Coastguard Agency’s (MCA) obligations to the Safety of Life at Sea (SOLAS) Convention by ensuring marine data of the UK coastal waters is accurate and kept up to date.
■ Advising the government, the MCA, and the public, as well as representing the government worldwide for expert advice on hydrography.

Our framework document sets out the purpose and role of UKHO, together with the governance, policy and finance parameters that guide its day-to-day operations [22]. It also captures MoD expectations for the Trading Fund, its Top-Level Objectives, and the arrangements in place to ensure the effective delivery of these expectations.

To deliver upon our Governmental responsibilities, UKHO has a dedicated Data Governance practice responsible for the implementation of Best Practice of people, processes, and procedures for handling geospatial data. One key area of responsibility is ensuring that persons have the right balance of accountability, responsibility, and expertise at their level of data ownership. This is achieved by using common Data Governance role (sub)titles across the organization, irrespective of actual business role titles that can varying from department to teams (and organizations/countries). Such standardized roles include Information Asset Owner, Data Custodians and Data Stewards with associated documented Best Practice behaviours, which are agnostic to their expert data discipline.

Using a common vocabulary for Data Governance roles (with the practical criteria to perform them) ensures interoperability of Governance structures, both within and without the organization. This enables UKHO to ensure that personnel meet the required level of competency, with any identified shortfalls and/or gap remediated via training solutions (Learning & Development).

Geospatial and Data Management teams have access to the required Learning & Development resources from civil service learning, MoD, industry, and an internal technical training team. Our approach to managing training follows rigorous policies and processes which are aligned with the Defence Systems Approach to Training (DSAT), ensuring our staff are competent to perform their tasks and that we meet our safety obligations.

[20] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/957537/24134_UKHO_AR19_20_Artwork_v29_Accessible_300dpi.pdf [Refer page #24]
[21] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/336499/UKHO-Public-Task.pdf
[22] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/392992/20150106_UKHO_Framework_Document.pdf

Reviewer Entry

Reviewer 1

Comments:
Accept
Describes UKHO as a whole; parts of the response belong to other requirements; adequate funding and sufficient numbers of qualified staff is implicitely described and can assumed to be sufficient.

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC’s on-going efforts to ensure adequate funding support and qualified staff members.

6. Expert guidance

R6. The repository adopts mechanism(s) to secure ongoing expert guidance and feedback (either inhouse or external, including scientific guidance, if relevant).

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Response:

The UKHO Bathymetry DAC hosts wide ranging datatypes, with all submitted scientific data relating to bathymetry totalling more than one petabyte. Data received can range from many terabytes to megabytes. The UKHO infrastructure that hosts the DAC allows archiving of datatypes and in collaboration with UKHO Bathymetry and Data Science teams, continues to make more datasets accessible.

The teams that support the DAC at UKHO are wide-ranging in expertise, ensuring the correct advice is sought and procedures developed. We have an in-house bathymetry technical advisor and bathymetry team who support the scientific analysis of data deposited and help shape technical data management.

There is also a specialist Data management team who work closely with the UKHO Data Science and UKHO Data infrastructure teams, to ensure that UKHO Bathymetry DAC data is supported the correct expertise.

The UKHO has technical working meetings with other Governments ALBs (MCA, GLA's, CEFAS and NOC) where technical, curation and disciplinary experts discuss and share advice regarding all aspects of bathymetry data.

UKHO staff also regularly engage in knowledge exchange with a range of organisations, including other repositories, data centres, and similar organisations around the world, e.g. Foreign Government Hydrographic Offices, Hydrographic Industry and other UK data centres (BGS, BODC) that interact on an ad hoc basis to coordinate and advise on various aspects of data management policy.

The UKHO proactively engages with the Seabed Mapping and marine geospatial data community through a team of product managers support by expert User Researchers. To support the users and ensure a quality service is delivered, a range of metrics including user satisfaction are measured and benchmarked. This is achieved through a regular survey and usability testing. Regular feedback is also encouraged through the customer services team or directly to the Product Management team alongside engagement by our team our experts to support and advise customers on an ad-hoc basis.

Reviewer Entry

Reviewer 1

Comments:
Accept
Well supported by expertise on different levels inside out outside

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC's efforts to secure ongoing expert guidance and feedback, through the in-house bathymetry technical advisor and collaboration with the bathymetry team and the UKHO Data Science and UKHO Data infrastructure teams.

DIGITAL OBJECT MANAGEMENT

7. Data integrity and authenticity

R7. The repository guarantees the integrity and authenticity of the data.

Compliance Level:

3 – The repository is in the implementation phase

Reviewer Entry

Reviewer 1

Comments:
3 – The repository is in the implementation phase

Reviewer 2

Comments:
3 – The repository is in the implementation phase

Response:

Our “UKHO Data Principles” are intended to serve as guidelines to direct behaviours and actions, supporting the UKHO’s aspiration, offering valuable information services to the expanding Blue Economy, alongside our traditional Product-based offerings for SOLAS and pure navigational needs. They can be considered as a “lens” through which to view (planned or in-progress) changes, developments, and business activities; to ensure they are being conducted and executed in support of wider organizational goals, while being aligned with other functional teams.

In summary, the UKHO Data Principles comprise the following main principles, each with subordinate subprinciples and further explanatory text (not repeated here for conciseness, but the full version is publicly available [23]). They are disseminated, embedded, and reinforced through UKHO in a manner befitting the needs of various teams – for example, those teams that directly handle data are given more intensive training into the practical implementation of the UKHO Data Principles. Another example is that our Technology Architecture teams are required to account for these principles when designing new solutions or platform, thus ensuring that Best Practice measures are hardwired into them (as applicable). This prevents future risks associated with retrofitting such measures back into them and empowering end-users to focus upon higher-level data considerations when low-level ones are already taken care of automatically.

1. Data is an Asset that has Value
a. We Source Once, Use Many
b. We retain received data As-Is
c. We prioritise data collection and analysis
d. We maximise the value of data
e. We ensure our own datasets comply with the Data Principles

2. Data must be Safeguarded
a. One Way In and One Way Out
b. We own and protect data
c. We manage the data lifecycle
d. We record data lineage

3. Data must be Easy to Use
a. Our data has metadata
b. Our data is sharable
c. Our data is standardised
d. Our data adheres to FAIR Principles
e. We present data appropriately

4. Data must be Fit for Purpose
a. We define data purpose at an appropriate level
b. We define and understand data veracity
c. We monitor data veracity

These Data Principles are intended to support the entire organization, providing a common denominator and shared understanding across diverse teams undertaking varied projects. Before its publication in 2019, many aspects of the Data Principles were already being practiced in different ways under different guises, either knowingly or not, but no organizational set of Data Principles existed at that time to unify the entire enterprise. This new single set of governing values for dealing with data is seen as crucial for UKHO transformation, which is a whole-of-organization endeavour that all functions must contribute to, not just those teams connected with the “Data as a Service” concept, since transitioning to a world-leading Geospatial Maritime Agency is far more than purely data provision, but an ecosystem of supporting factors.

Since our Data Principles are intended to serve the entire organization, they are necessarily non-exclusive and widely applicable. They are intended to be simple but not simplistic, encompassing the critical aspects needed for a world-leading Geospatial Maritime Agency. While some aspects may indeed be self-evident for subject matter experts in each field, they may not always be as readily apparent in every situation, so such overarching guidance is an essential organizational tool. Having such a “lens” with which to view an otherwise straightforward (or even complex) situation could thus offer opportunities to make changes to the wider or future benefit of the organization. The Data Principles are intended to drive incremental positive changes in behaviour, amongst individuals and teams (as well as entire groups), that accumulate or compound to deliver organizational excellence.

The following is also of relevance to preserving data (R10). UKHO does not currently adopt Digital Object Identifiers (DOIs), please refer to section R13. Internal version control is managed through robust procedures and processes which are audited for our ISO9001 certification as they support our stringent Safety of Life at Sea obligations. Due to the irregular extents and frequency of bathymetric data collection, version control is achieved by supplying each individual dataset with a Unique Persistent Identifier (UID) as described above. This enables users to discover data within a given area and observe any temporal trends. Data is never overwritten / superseded for this reason.

[23] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1030101/A_request_for_the_UKHO_s_organisation_information_around_their_internal_plans_and_strategy_documents_around_ICT_Redacted.pdf

Reviewer Entry

Reviewer 1

Comments:
Accept
Description concentrates on the UKHO data principles. Persistent identifiers like DOI are missing - instead internal UID. However, it is sufficiently credible that data are persistently referencable

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC’s efforts to guarantee the integrity and authenticity of the data.

8. Appraisal

R8. The repository accepts data and metadata based on defined criteria to ensure relevance and understandability for data users.

Compliance Level:

3 – The repository is in the implementation phase

Reviewer Entry

Reviewer 1

Comments:
3 – The repository is in the implementation phase

Reviewer 2

Comments:
3 – The repository is in the implementation phase

Response:

UKHO DAC bathymetry data sets available through the MDP are accompanied by metadata complying with MEDIN Discovery Metadata Standard v2.3.8. The MEDIN metadata schema is based on the ISO 19115:2003 standard and includes all core INSPIRE metadata elements. It also complies with the UK GEMINI 2.3 metadata standard. The XML produced conforms to the ISO 19139 standard for XML implementation.

All data received by UKHO is archived. We operate pro-active data collection campaigns both within the UK and abroad, however majority of data received is from third parties. We have a triage process for identifying where data requires analysis for the primary mission of UKHO (SOLAS navigation safety) – however all received data is retained and archived irrespective of this.

We have metadata guidance and submission forms (H275) based on our metadata requirements, which we actively encourage all data suppliers to complete when submitting data to UKHO. The H275 form can be downloaded from the ADMIRALTY Marine Data Portal along with survey specifications [24]. The UKHO intends to work with its data suppliers over the coming years to understand their needs in improving the data submission process. We will then use the user requirements to consider and implement potential options to improve the data submission process.

The metadata and data formats received are manually validated by UKHO experts and suppliers are contacted if the supplied metadata or data format has any inconsistencies or omissions that would prevent long-term preservation. Where preferred formats are not supplied, the supplying organization is contacted to request this. If this is not possible, UKHO possesses a variety of tooling to enable conversion into a more appropriate format for long-term preservation. A list of preferred formats is published in the H275 and supported by wider guidance documentation [24].

All UKHO data is archived and never removed, although where data permissions do change, processes for customer-facing web apps exist to remove this data – Unique Persistent Identifiers (UIDs) are still retained internally.

[24] https://datahub.admiralty.co.uk/portal/apps/sites/#/marine-data-portal/pages/seabed-mapping-services

Reviewer Entry

Reviewer 1

Comments:
Accept
Criteria and procedures for data acceptance and ingest described, although not clearly visible on the website; a data submission frontend is missing.

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC's efforts to ensure relevance and understandability for data users, through adoption of the MEDIN Discovery Metadata Standard v2.3.8, which is based on the ISO 19115:2003 standard and includes all core INSPIRE metadata elements.

9. Documented storage procedures

R9. The repository applies documented processes and procedures in managing archival storage of the data.

Compliance Level:

3 – The repository is in the implementation phase

Reviewer Entry

Reviewer 1

Comments:
3 – The repository is in the implementation phase

Reviewer 2

Comments:
3 – The repository is in the implementation phase

Response:

The Change Management process at UKHO is ISO9001 accredited, using Microsoft SharePoint as our Document Management system, to meet ISO requirements for approval, correct versioning at points of use, and control procedures for long-term storage [25]. Under ISO9001, the UKHO is certificated for the "Production of digital and paper hydrographic

products and other allied products and services, including the processing of electronic navigational chart (ENC) data, to cover UK national, defence and civil needs and to provide customers with readily accessible hydrographic products, information and services worldwide." (Evidence of ISO9001 accreditation provided in confidence with this submission.)

UKHO use a combination of storage methods and in September 2020, all existing backup data stored on Linear Tape-Open (LTO) was ingested onto Microsoft Azure Cloud, helping ensure against media deterioration. Raw data archives are synchronised on Apollo servers at both the UKHO HQ Datacentre and UKHO Disaster Resilience Datacentre in Plympton, with additional geographical redundancy via Microsoft Azure Cloud. All outputs from UKHO Validation Operations and the appraisal of bathymetry data are hosted in the CARIS Bathy Database. This Database is hosted on the UKHO HyperV platform, which utilises direct storage spaces as its storage area network and is replicated to the Plympton site.

[25] https://www.gov.uk/government/publications/iso-90012015

Reviewer Entry

Reviewer 1

Comments:
Accept
Part describes backup procedures and structures (good).

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC's efforts to apply documented processes and procedures in managing archival storage of the data.

10. Preservation plan

R10. The repository assumes responsibility for long-term preservation and manages this function in a planned and documented way.

Compliance Level:

3 – The repository is in the implementation phase

Reviewer Entry

Reviewer 1

Comments:
3 – The repository is in the implementation phase

Reviewer 2

Comments:
3 – The repository is in the implementation phase

Response:

UKHO acts as the UK Bathymetry Data Archive Centre (DAC) and assumes an indefinite retention of all bathymetric data received. As the national government repository for bathymetry information, our mission mandate is to hold and archive all data in perpetuity.

We acknowledge that this is currently assumed, and our next submission will contain a preservation plan to make this more explicit. This work will form part of a wider UKHO Data Architecture Strategy (draft version supplied in confidence to reviewers) to be followed by an implementation plan (ahead of FY22/23). This Strategy contains a draft implementation roadmap in Appendix B that defines the high-level milestones for delivery that will continue to evolve. UKHO are additionally looking to improve policies with business-wide agreement and formalisation in the following key areas:

– Data retention policies.
– Data migration approach to ensure data integrity for reducing the risk of technology and file format obsolescence.
– Formalise and document our approach to the provision and updating of discovery metadata or formats to ensure records remain relevant and accessible into the future.

This evolving and ongoing work is underpinned by two aspects; the first being the UKHO Information Asset Register (mandatory obligation from wider Government) that states that all Source Data shall be kept permanently. The second aspect is the non-functional requirement for the UKHO Data Platform, which also stipulates the permanent retention of Source Data. (Evidence of both points are provided in confidence within the UKHO Supporting Evidence document that accompanies this submission.)

We are committed to both awareness and contribution towards evolving data standards (UKHO holds strategic membership of the Open Geospatial Consortium). We also continue to monitor both data and metadata standards at various international and national forums. For example, we are active members of International Hydrographic Organisation working groups that are defining the next generation of data and metadata standards [26,27]. We also contribute to MEDIN standards working groups to ensure we are aware of both current and upcoming developments in discovery metadata standards (e.g. GEMINI and by definition, INSPIRE and ISO19115)

The above engagements and our internal Technology expertise then allow us to make decisions to ensure long term safety and integrity of our archived data. For example, data was previously held in an LTO tape archive, but this has recently been migrated to Azure cloud storage to ensure resilience and long-term preservation. Through our engagement with the MEDIN standards working group and wider MEDIN community, we also ensure current and future provision of discovery metadata for archived data, thus ensuring continued compliance with up-to-date metadata standards. By way of an example, we are currently upgrading the metadata records (6000+ records) from v2.3.8 to v3.1 of the MEDIN discovery metadata standard by March 2022.

Data permissions are managed at a supplier level and relevant permissions (rights to copy, transform, store, and provide access) are held within a supplier management system (Microsoft Dynamics 365). These are agreed at time of receipt or ahead of this. Where these are not clear or are historically incomplete, we are proactively contacting suppliers to ensure

as much data as possible is made publicly available. This supplier management system (D365) is connected to our internal data platform and drives release processes (Element 20 / 21 of the MEDIN profile). We have internal process / procedures that enforce the receipt and archiving process.

The UKHO is a Place of Deposit under The Public Records Act 1958 [28]. Aspects of data retention are also covered by several other Acts of Parliament that are being reviewed with the intention of modernising relevant legislation [29]. The UKHO would be covered by such initiatives.

Explicit planning to the continuity of UKHO is made in the confidentially supplied UKHO Framework Document (to be published during 2022) that outlines the purpose of UKHO, corporate governance structures, risk management board, performance monitoring committee, Parliamentary accountability, Ministerial responsibilities, plus UKHO-applicable Acts of Legislation or Government directives.

Further reference is also made within the UKHO Annual Report 2020/21, which is published online and approved by the Comptroller and Auditor General to the Houses of Parliament [30]. Specific reference to seabed mapping is made on page 21, with yearly updated information on strategic risks, sustainability, governance, and performance, both financially and operationally, within the main body of this report.

If at some time in the future the UKHO is not required to fulfil this role or is disbanded, an appropriate plan will be developed to ensure that the data and metadata are transferred. This will include notifying the original donor and giving them the opportunity to reclaim the data.

[26] https://discover.admiralty.co.uk/news/S-100-new-data-standards
[27] http://s100.iho.int/product%20specification/division-search/s-102-bathymetric-surface
[28] https://www.nationalarchives.gov.uk/information-management/legislation/public-records-act/
[29] https://www.nationalarchives.gov.uk/information-management/legislation/
[30] https://www.gov.uk/government/publications/uk-hydrographic-office-2020-2021-annual-report-released

Reviewer Entry

Reviewer 1

Comments:
Accept.
A preservation plan is in preparation. Sufficient evidence is supplied that long term preservation is managed adequately.

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC’s efforts to assume responsibility for long-term preservation and manages this function in a planned and documented way.

11. Data quality

R11. The repository has appropriate expertise to address technical data and metadata quality and ensures that sufficient information is available for end users to make quality-related evaluations.

Compliance Level:

3 – The repository is in the implementation phase

Reviewer Entry

Reviewer 1

Comments:
3 – The repository is in the implementation phase

Reviewer 2

Comments:
3 – The repository is in the implementation phase

Response:

The UKHO Data Archiving centre requires that all datasets have comprehensive discovery metadata and employs the MEDIN version 3.1 metadata standard which complies with UK GEMINI, ISO 19115:2003 (Geographic Information Metadata) and INSPIRE standards for all deposits. The data is archived/stored on the UKHO Data Platform that adheres to the above standards.

UKHO have made improvements to the metadata field called Resource Abstract, which now includes detailed descriptions of the data content, along with improvement of the dataset titles that now have unique and meaningful names. As stated in section R7, UKHO currently do not use DOIs however we do use persistent file identifiers which can be found in the metadata.

The UKHO has extensive expertise in the validation of quality of bathymetric data and has rigorous internal process given much of this data is used for Safety of Life at Sea (SOLAS). In doing this we assess data quality in alignment with the International Hydrographic office (IHO) S44 quality standard [31] for Hydrographic Surveys and this is held within the metadata provided to end users.

We share this expertise with as wide an audience as possible by providing simple guides e.g. “A guide to Bathymetry” as well as providing specifications for both data, collection and submission based on recognized international standards already identified above. Reference “Seabed Mapping Expertise” on the ADMIRALTY Marine Data Portal [32].

Discovery metadata for the datasets held by the UKHO DAC is made available on the ADMIRALTY Marine Data Portal. This discovery level metadata is harvested by several systems including Data.gov.uk and the central MEDIN portal. Technical adherence to metadata standards and overall quality of the metadata is provided from internal validation rules

and externally on an annual basis through the MEDIN network. Additionally, Dataset records published to Data.gov.uk are required to undergo an authoritative data assessment using the Authoritative Data Assessment Tool [33] from the Geospatial Commission. This tool ensures that release data meets a minimum standard of quality across participating Government agencies before public release.

The above processes and systems are aligned with our Data Governance Strategy, Data Principles and are subject to oversight from the Data Governance Steering Group (under defined Terms of Reference). The Data Governance Steering Group is comprised of Senior representatives across the UKHO divisions including those with regular contact and relationships with consumers and suppliers of our Data, who can directly feedback any data issues, improvements and/or insights. The Steering Group is empowered to make decisions to resolves any identified data issues such as returning to data provider for rectification, fixing before being deposited in the repository, noting quality flags in the data file, and/or including in the accompanying metadata.

We hold monthly Service Reviews (under defined Terms of Reference) with a broad cross section of stakeholders to continuously monitor and review the levels of performance that our products and services deliver for our customers to ensure that these consistently meet our customers' needs.

UKHO does not currently adopt Digital Object Identifiers (DOIs), please refer to section R13. Although we would like to move towards ISO19115 Data Quality descriptors, we are currently bound by the International Hydrographic Organisation (IHO) standards for data quality [34]. As part of our wider Data Governance journey, describing data quality is one of our key Data Principles and so we will continue to explore how we can better align IHO standards to the ISO data quality descriptors.

[31] https://iho.int/uploads/user/pubs/standards/s-44/S-44_Edition_6.0.0_EN.pdf
[32] https://datahub.admiralty.co.uk/portal/apps/sites/#/marine-data-portal/pages/seabed-mapping-services
[33] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/911672/Authoritative_Data_Assessment_Process_tool_V_1.1.ods
[34] https://iho.int/uploads/user/pubs/standards/s-4/S4_V4-9-0_March_2021.pdf

Reviewer Entry

Reviewer 1

Comments:
Accept
Following the standards descriptions, the data curation level supplied, and the expertise and feedback from data suppliers, data quality can presumed to be good. Metadata could be enhanced by description of the data content (ISO19115 ContentInfo). UKHO uses internal identifiers (UID).

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC's efforts to address technical data and metadata quality and ensures that sufficient information is available for end users to make quality-related evaluations, through the adoption of relevant data/metadata standards, ISO 9001:2008 process, and monthly review services.

12. Workflows

R12. Archiving takes place according to defined workflows from ingest to dissemination.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Response:

The UK Hydrographic Office has policies and procedures in place to cover the lifecycle of the data from submission to archiving. The Marine Data Portal contains instructions for the acquisition and submission of bathymetry data.

The guide to Bathymetry [35] gives an overview of what bathymetry is and the different hydrographic survey methods. It also provides detail on bathymetry-related terms such as ‘datums’ and ‘grids’, as well as guidance on data cleaning and data formats. Including a metadata form [36] to compliment the guide detailing metadata requirements and supplementary specifications [37] for UKHO Surveys.

All data received is audited and recorded within our Source, Data Receipt, Assessment (SDRA) database and follows a strictly governed workflow process to ensure data prioritization and processing. All data is assigned an identifier at the point of entry to the repository, and these internal identifiers will persist for the lifetime of the original deposit as part of an archive.

The workflow, policies, and quality procedures and structured and controlled using “High Level Plans” (internal document available upon written request), in accordance with ISO 9001:20XX, which enables instructions to be accessible through process flow diagrams and content displayed in wiki format. Any change to workflows, policies or procedures is conducted using the “Production Flowline Change Control process”. (Evidence as screenshots within the attached UKHO Supporting Evidence document.)

The UK Hydrographic Office (UKHO) is committed to openness and transparency, making information available where

possible [38]. As a Trading Fund and Executive Agency of the Ministry of Defence (MOD), we fully support our obligations under the Freedom of Information Act 2000 (FOIA) and the Environmental Information Regulations (EIRS).

As an appointed Place of Deposit for hydrographic records under Section 4 (1) of the Public Records Act 1958, UKHO data management currently conforms to National Archives and MoD practices and recommendations.

The data is archived/stored in the UKHO Data Platform, which adheres to the above standards and there is ongoing work to build a UKHO External Ingest Portal (scheduled to go later in 2022) to receive data, metadata, and to document the terms of deposit in a more automated manner.

[35] https://datahub.admiralty.co.uk/portal/sharing/rest/content/items/34f06847efbe4c24953d2783d360e8fc/data
[36] https://datahub.admiralty.co.uk/portal/sharing/rest/content/items/daadc5904ba84221bf1a13269ac902ad/data
[37] https://datahub.admiralty.co.uk/portal/sharing/rest/content/items/086521ce9e6844bd8f729469ed3a97f4/data
[38] https://www.admiralty.co.uk/freedom-of-information

Reviewer Entry

Reviewer 1

Comments:
Accept
Guideline has been fully implemented, UKHO External Ingest Portal supposed to make the workflows and conditions more transparent to users might be availabe late 2021

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC's efforts to ensure archiving takes place according to defined workflows from ingest to dissemination, through appropriate instructions, auditing and recording within the Source, Data Receipt, Assessment (SDRA) database, and following a strictly governed workflow process.

13. Data discovery and identification

R13. The repository enables users to discover the data and refer to them in a persistent way through proper citation.

Compliance Level:

3 – The repository is in the implementation phase

Reviewer Entry

Reviewer 1

Comments:
3 – The repository is in the implementation phase

Reviewer 2

Comments:
3 – The repository is in the implementation phase

Response:

Customer-facing front end search facility is provided by geographic area due to the nature of the data [39]. The internal UKHO central catalogue (Data Platform) has enhanced search functionality (supplier, additional metadata, numerous internal stores archive, processed working area etc) is based on MEDIN 2.8, but plans are in place to upgrade to v3.1 by March 2022 (covering ISO, Gemini and INSPIRE standards). Releasable metadata is currently exposed via the customer-facing front end in MEDIN v2.8.

UKHO institutes Unique Persistent Identifiers (UIDs) for each data product hosted that are persistent between internal and customer facing front end. We do not currently facilitate machine harvesting, but work is in hand with the UK Government's Geospatial Commission to make this available via a Web Accessible Folder (WAF) by March 2022. UKHO however has plans to enable this capability by March 2022 via a REST API and onwards plans to move towards an OGC compliant catalogue service.

Metadata is available via data.gov.uk to GEMINI standards and from the UK MEDIN central repository to MEDIN standards. The MEDIN metadata standard accounts for Responsible Party (originator, custodian, distributor, owner, and metadata point of contact).

UKHO does not currently adopt Digital Object Identifiers (DOIs) or other formally named online resource, and we currently have no definite plans to do so. Internally generated unique IDs are exposed externally within the metadata. We are currently building a newly improved front end (currently at beta stage) that uses the Unique Persistent Identifiers (UID) in the file naming convention when downloading datasets [40]. UKHO intends to work with its user base to understand their requirements surrounding DOIs over the coming years.

[31] https://datahub.admiralty.co.uk/portal/apps/webappviewer/index.html?id=bd7cb85270ce4366bf0db9f515c37fae
[32] https://seabed.admiralty.co.uk

Reviewer Entry

Reviewer 1

Comments:
Accept
Comprehensive access supplied via MEDIN. The Marine Data Portal lists groups of available data and a contact formular to get access. Persistent identifiers except internal ones are not used. ISO19115 is supplied, WAF is planned.

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC's efforts to enable users to discover the data and refer to them in a persistent way through proper citation, through the adoption of UKHO institutes UIDs, the internal UKHO central catalogue, data.gov.uk, and an OGC compliant catalogue service.

14. Data reuse

R14. The repository enables reuse of the data over time, ensuring that appropriate metadata are available to support the understanding and use of the data.

Compliance Level:

3 – The repository is in the implementation phase

Reviewer Entry

Reviewer 1

Comments:
3 – The repository is in the implementation phase

Reviewer 2

Comments:
3 – The repository is in the implementation phase

Response:

UKHO DAC bathymetry data sets available through the MDP are accompanied by metadata complying with MEDIN Discovery Metadata Standard v2.3.8. The MEDIN metadata schema is based on the ISO 19115:2003 standard, and includes all core INSPIRE metadata elements. It also complies with the UK GEMINI 2.3 metadata standard. The xml produced conforms to the ISO 19139 standard for xml implementation.

The MDP provides data in two community focused formats ASCII and Bathymetry Attributed Grid (BAG). ASCII is used for data which is not or cannot be gridded whilst the BAG format support gridded data. BAG is a file format designed to store and exchange bathymetric data and underpins the IHO S-102 Bathymetric Surface Data Product. The decision to supply data via the MDP in these formats was based on community feedback and the best data format for the data provided on our experts advise.

Our master data platform has been developed to be extensible and can flex based on our user needs for alternative data formats and the potential for future changes to standards. Through our engagement with users and the wider standards community, such as OGC Strategic Membership, we are proactive in meeting these user needs and any changes to output will be prioritised through application of Product Management Best Practice.

Reviewer Entry

Reviewer 1

Comments:

Accept
Standards for metadata in place, data formats dito. It should be stated that the facility is ready to migrate to other formats if needed.

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC's efforts to ensure the reuse of the data over time and appropriate metadata are available to support the understanding and use of the data, through the adoption of the MEDIN Discovery Metadata Standard v2.3.8 and appropriate data formats.

TECHNOLOGY

15. Technical infrastructure

R15. The repository functions on well-supported operating systems and other core infrastructural software and is using hardware and software technologies appropriate to the services it provides to its Designated Community.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Response:

A 200 GB fibre optic link between Taunton and Plympton (Disaster Resilience Site) enables the fast synchronisation of data between the Apollo servers. UKHO also has 2 x 1 GB links from Taunton to the Internet to enable connectivity to Azure and 1 x 1GB link from Plympton to Azure for backup purposes. These are currently enough for existing needs and will be increased as needed. CACTI is used to monitor network connections with SolarWinds used to monitor service, server availability and server status. No community supported software in use.

1. UKHO Communication and Information Systems (CIS) are accredited by the Defence Security Standards Organisation

(DSSO). The DSSO is responsible for providing an INFOSEC Accreditation and advice service; Penetration Testing; coordination of Electronic Security Environment (ESE) inspections and Vulnerability Analysis (VA) programme across the MoD. It undertakes independent Security Risk Management audit, providing advice and consultancy services to Top Level Budgets and Trading funds.

2. The vehicle for the accreditation process is the Accreditation Document Set (ADS). Each domain at the UKHO has an ADS (irrespective of data classification or ownership), which focuses on the risks to Confidentiality, Integrity and Availability and must be Compliant with JSP440; the MOD implementation of HMG Manual of Protective Security (MoPS).

3. The MoPS is published by the Cabinet Office, containing general requirements and guidance for the handling of protectively marked information in electronic and other forms. It provides UK Government guidance for the implementation of ISO/IEC17799 controls.

4. Each ADS comprises a Security Risk Assessment (SRA), Security Requirement Statement (SRS), Operational Security Management Plan (OSMP) and Security Aspects of Design (SAD). They use a Defence in Depth approach to ensure that the Global Security Environment (GSE), Local Security Environment (LSE) and Electronic Security Environment (ESE) protect the data effectively and show that the risks that are relevant to the assets have security driven requirements in the solution, which have through-life management. Security risks identified within the ADS as requiring management are transferred to Corporate Risk Registers. Equally the personnel security and supporting process (Configuration, Change and Asset management which are al ITIL based) are identified. Each ADS also considers the impact of domain interconnections and to Wide Area Networks.

5. The UKHO is effectively a single site establishment which is ring fenced and guarded 24/7. Building and room security is relative to the assets housed within. Staff are identified by passes and visitors are not permitted on site without prior arrangement through a sponsor.

6. Access to any of our networks and setting of user privilege is managed through the Change Process and must be initiated from the requestor’s line management chain. Local procedure for air gapped CIS covers the closure of accounts and the HR process stimulates the closure of any network accounts when staff leave the UKHO.

7. Backup schedules are defined in the OSMP for each domain with frequency driven by the Availability Impact Level applied to the asset, as is the requirement for back-up power supply from either UPS or generators. Backup tapes are stored locally on site in fireproof safes and off site (under reciprocal arrangements with other MOD sites). Access to them is provided using secure furniture from the Security Equipment Assessment Panel (SEAP) catalogue. SEAP are responsible for the evaluation and approving of security equipment.

8. The UKHO employs an IT Security Advisor and IT Security Officer. The UKHO has sufficient IT Security Awareness to know that including further detail about our Database and Password Policies, Firewall Configuration and Access control would put us at greater risk.

Reviewer Entry

Reviewer 1

Comments:
Accept
Technical infrastructure uses up to date technologies; very good: usage of cloud components.

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC's efforts to ensure that the repository functions are on well-supported operating systems and other core infrastructural software and is using hardware and software technologies appropriate to the services it provides to its Designated Community.

16. Security

R16. The technical infrastructure of the repository provides for protection of the facility and its data, products, services, and users.

Compliance Level:

4 – The guideline has been fully implemented in the repository

Reviewer Entry

Reviewer 1

Comments:
4 – The guideline has been fully implemented in the repository

Reviewer 2

Comments:
4 – The guideline has been fully implemented in the repository

Response:

The UK Hydrographic Office is ISO 27001 certified and operates a compliant Information Security Management System (ISMS). The scope of our certification includes the design, development, hosting and provision of software and services, in support of the UKHO as a maritime geospatial agency, including processes and locations in support of the UKHO commercial business. Our ongoing certification is subject to independent, bi-annual audits from our certification body.

In addition to our ISO 27001 certification, and as a requirement of the UKHO being a MoD organisation, our Information Systems are formally accredited by the Cyber Defence and Risk Directorate (CyDR). In this context, accreditation is defined as a formal, independent assessment of technology or service against its Information Assurance (IA) requirements, resulting in the acceptance of residual risk in the context of the business requirements and information risk appetite.

The UKHO has a dedicated Information Security team, led by the Head of Information Security, and supported by IT Security Officers. In addition, there exist several roles associated with Information Security. These include a Senior Information Risk Owner (SIRO), Chief Technical Officer (CTO), Deputy Chief Information Officer (DCIO), Information Asset Owners (IAO) and Custodians (IAC).

The following high-level information security principles provide overarching governance for the security and management of information at the UKHO.

1) Information will be classified according to an appropriate level of confidentiality, integrity, and availability and in accordance with relevant legislative, regulatory, and contractual requirements.
2) Staff with responsibilities for information security must understand their responsibilities and must abide by any contractual requirements, policies, procedures, or systems for meeting those responsibilities.
3) All users must handle information appropriately and in accordance with its classification level.
4) Information should be both secure and available to those with a legitimate need for access in accordance with its classification level. To that end, access to information will be based on the following principles: (a) Least privilege and (b) Need to know.
5) Information will be protected against unauthorised access and processing in accordance with its classification level.
6) All information security breaches must be reported and investigated in accordance with the UKHO incident management policy
7) Information security and the policies that guide it will be regularly reviewed, including using annual internal audits and penetration testing.

Reviewer Entry

Reviewer 1

Comments:
Accept
High level of security

Reviewer 2

Comments:
Accept
Response provided clear evidence on UKHO DAC's efforts to ensure that the technical infrastructure of the repository provides for protection of the facility and its data, products, services, and users.

APPLICANT FEEDBACK

Comments/feedback

These Requirements are not seen as final, and we value your input to improve the CoreTrustSeal certification procedure. Any comments on the

quality of the Requirements, their relevance to your organization, or any other contribution, will be considered as part of future iterations.

Response:

We welcome the comments from the Reviewers and trust the amendments to our resubmission meets their expectations.

Reviewer Entry

Reviewer 1

Comments:
Board comment: We appreciated the hard work and feel a good effort has been made. This application has a lot of level 3 compliance levels ‘in progress’ for the renewal in 3 years the board will expect more requirements on compliance level 4.

Reviewer 2

Comments:
Responses to each requirement provided by the UKHO DAC provides sufficient evidence that UKHO DAC is CoreTrustSeal compliant.
Recommend approving UKHO DAC’s application.

Board comment: We appreciated the hard work and feel a good effort has been made. This application has a lot of level 3 compliance levels ‘in progress’ for the renewal in 3 years the board will expect more requirements on compliance level 4.