"*Delivering Military Advantage through multi-national geospatial interoperability*"

DGIWG 910

Vector Data Roadmap

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Abstract: This document summarises the development and maintenance activities that the DGIWG P1 Vector Data Technical Panel will be undertaking in the next 24 months. Emphasis is on promoting interoperability of geospatial data, products, and services; and being responsive to requirements of the Defence Geospatial community.

Table of Contents

Table of Tables

Table of Figures

Executive Summary

This document describes the aims and objectives of the DGIWG Vector Technical Panel (P1) outlining its current and planned activities and deliverables within the short, medium, and long term time horizons.

The document complements the DGIWG Geospatial Reference Architecture and other DGIWG Panel Roadmaps in supporting the DGIWG Program of Work.

The document is reviewed and updated annually to ensure currency. .

ii. Contributing participants

Nation	Parent Organisation
CAN	Mapping and Charting Establishment (MCE)
USA	National Geospatial-Intelligence Agency (NGA)
GBR	Joint User, Joint Geospatial Intelligence (JGI)

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iv. Revision history

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Dec 2022	2.0 (WD2)	All Clauses, Initial Revised Draft	Review, Rewrite and improved content for internal P1 review
Feb 2023	2.0 (FD)	All Clauses. Revised Draft	P1 comment resolution, edits, revision, update, and formatting.
Apr 2023	2.0 (DP)	DGIWG Publication. All Clauses. Final draft revised and harmonized. P0 Quality Control completed	Edition 2.0 replaces edition 1.0 published in July 2019

1 Introduction

1.1 The DGIWG Vector Data Technical Panel (P1) develops and maintains standards and specifications that facilitate the efficient exchange of vector-based geospatial information and products among partners. The P1 develops solutions with consideration to both current and emerging technologies and techniques.

1.2 Vector-based data, normally referred to as a feature, is precise geospatial data comprised of points, curves, and surfaces that represent a geospatial phenomenon on the surface of the Earth coincident in time and space. Vector geospatial data includes a relational link between a feature and additional tabular data containing further information or attributes of that feature. Locations of wells, road segments, boundaries of specific land use areas, building and structure footprints, drainage patterns, and cadastral data are a few of the extensive examples of vector-based data with the vector locations usually being linked to specific data about that location (e.g. road surface material, well depth and type, ownership information, physical condition, etc.)

1.3 DGIWG Vector Data Standards, and their derivatives, are developed and maintained as part of the Defence Geospatial Information Framework (DGIF) series of standards and specifications.[1]

1.4 The P1 comprises all projects and maintenance efforts that constitute the DGIF and its derived profiles, mappings, and product specifications. The DGIF includes an information model, data dictionary, real-world index, related tools, artefacts, schemas and products.

1.5 The Vector Model and Schema Team (VMST) is the persistent team within P1 responsible for maintenance and the evolution of the DGIF to meet national and international client requirements and the demands of implementation technology.

[1] A high-level overview of Defence Geospatial Information Framework (DGIF) and its components can be found in DGIWG 200 https://dgiwg.org/documents/dgiwg-standards

1.6 Individual project teams are established on an as-basis to develop data product specifications (DPS) to satisfy client requirements. These operate independently, in-parallel but, in cooperation with the VMST.

1.7 This document describes the current DGIF standardisation landscape and the development trajectory of the P1 at the time of this writing.

2 Scope

2.1 This roadmap serves as both a strategy and planning tool for the DGIWG, the P1, and its member organisations and associates. It further describes current and future development activities relating to geospatial vector data standardisation within DGIWG. This document has the following key sections:

- The target vector data architecture.
- The current P1 responsibilities.
- The current and planned P1 activities.
- An assessment of the emerging concepts and associated standards that influence or have the potential to influence vector data standardisation.

3 References

3.1 DGIWG Documents

3.1.1 DGIWG 933, DGIWG Geospatial Reference Architecture (DGRA), 2022

3.1.2 DGIWG Requirements Tracker, 2022

3.1.3 DGIWG 902, Program of Work (PoW), 2022

3.1.4 DGIWG 930, Business Manual, 2022

1.1.5 DGIWG 904, Defence Geospatial Standards Baseline (DGSB)

3.2 DGIWG Standards

3.2.1 DGIWG 200, Defence Geospatial Information Framework (DGIF) Overview (v2.0) 2017

3.2.2 DGIWG 205: Defence Geospatial Information Model (DGIM) (v2.0) 2017

3.2.3 DGIWG 206, Defence Geospatial Feature Concept Dictionary (DGFCD) Descriptions and Content (v2.0) 2017

3.2.4 DGIWG 207, Defence Geospatial Real World Object Index (DGRWI) (v2.0) 2017

3.2.5 DGIWG 208, Defence Geospatial Information Framework Encoding Specification – Part 1: Product Implementation Profile (v2.0), 2017

3.3 International Organization for Standardization (ISO)

3.3.1 ISO 19131:2022, Geographic Information - Data Product Specifications

1.4 North Atlantic Treaty Organization (NATO)

3.4.1 STANAG 2592, Ed:2 NATO Geospatial Information Framework (NGIF) 2018

3.4.2 AGeoP-11 Ed: B Ver.1, NATO Geospatial Information Framework (NGIF)

4 Terms and abbreviations

Table 1: Table 1: List of abbreviations and acronyms

Acronym	Definition
DCM	Defence City Map
DMGEM	Defence Maritime Geospatial Exchange Model
DFDD	DGIWG Feature Data Dictionary
DGFCD	Defence Geospatial Feature Concepts Dictionary
DGIF	Defence Geospatial Information Framework
DGIM	Defence Geospatial Information Model
DGIWG	Defence Geospatial Information Working Group
DGRA	Defence Geospatial Reference Architecture
DGRWI	Defence Geospatial Real-World Object Index
DJOG(A)	Defence Joint Operations Graphic (Air)
DMF	DGIWG Metadata Framework

DPS	Data Product Specification
DTM50	Defence Topographic Map 1:50,000 scale
DTOX	Defence Topographic Exchange
DCM	Defence City Map
DVOF	Digital Vertical Obstruction File
EA	Enterprise Architect
FOAF	Friend Of a Friend
FTP	File Transfer Protocol
GAWG	Geospatial Aeronautical Working Group
GIS	Geographic Information System
GML	Geography Mark-up Language
GMWG	Geospatial Maritime Working Group
GPKG	GeoPackage
GRWG	Geospatial Requirements Working Group
ICM	Image City Map
IHO	International Hydrographic Organisation
IPHG	International Program for Human Geography
ISO/TC211	International Organisation for Standardisation, Technical Committee 211 (Geographic Information)
JGSWG	Joint Geospatial Standards Working Group
JOG(A)	Joint Operations Graphic (Air)
JSON	JavaScript Object Notation
MDG	MGCP Derived Graphic
MGCP	Multinational Geospatial Co-Production Program
MUVD	MGCP Urban Vector Data
NATO	North Atlantic Treaty Organisation
NGIF	NATO Geospatial Information Framework
NGMP	NATO Geospatial Metadata Profile
OCL	Object Constraint Language
OGC	Open Geospatial Consortium
OSM	Open Street Map

OWL	Web Ontology Language
P1	Vector Panel
PO	Product Object
POI	Point Of Interest
PRD	Production Reference Document
RDF	Resource Description Framework
RWO	Real World Object
SME	Subject Matter Expert
SPARQL	SPARQL Protocol and RDF Query Language (sic)
STANAG	Standardization Agreement
TPC	Tactical Pilot Chart
TRD	(MGCP) Technical Reference Document
UML	Unified Modelling Language
URI	Uniform Resource Identifier
VMST	Vector Model and Schema Team
XML	Extensible Mark Up Language

5 Target Architecture

5.1 This section amplifies those elements of the DGIWG Geospatial Reference Architecture (DGRA) (DGIWG 933) that are relevant to P1. It outlines DGRA-related support the panel anticipates providing.

5.2 DGIF provides a common modelling solution and semantic framework that enables standardised vector information exchange and the generation of standard geospatial product specifications. DGIF-derived and related standards and specifications enable interoperability between the data schemas of interested nations and ensure consistent data products and services for the end-user of defence geospatial information.

5.3 The vision for DGIF success is in maximising and maintaining vector data conformance and/or compliance of Defence Geospatial community vector data providers, producers and consumers to the DGIF Data model and DGIF compliant specifications.

5.4 Organisations and communities that create, share, or consume vector-based data for the defence community can facilitate effective exchange of data through adherence to standards-based semantics, syntax, and data structures. Use of these standards enable vector data to be organised and configured into precise formats and structures that can be exchanged, consumed, and exploited without loss or distortion of the data. The DGIF defines defence community-based exchange and encoding standards and/or data product specifications to support these requirements.

5.5 Conformance to DGIF standards and specifications supports efficient and lossless exchange of vector data. The use of a DGIF standard ensures that both producer and recipient have a common understanding of the data content and structure being created. Data production programs can also engage in burden-sharing for cooperative data development. Additionally, minimum standards of quality can be enforced, and data can be more rapidly exploited with little to no “data conditioning” required.

5.6 The creation, management, sharing, and exploitation of vector-based data is simplified by the application of consensus-based data standards. Adherence to such standards positions enables the defence user community to exploit vector data for the missions and needs of today and the missions of the future.

5.7 The target for future work in the P1 is to continue the logical evolution of the DGIF to better serve the evolving needs of the Defence Geospatial community for vector data exchange and data product generation. A specific focus area is the migration from interoperability via product-specific data towards collection, exchange, and utilization of data for multiple sources for multiple mission in relevant open standard formats.

6 Current Responsibilities

Figure 1 depicts the general overview of P1 Technical Panel structure and program of work activities.

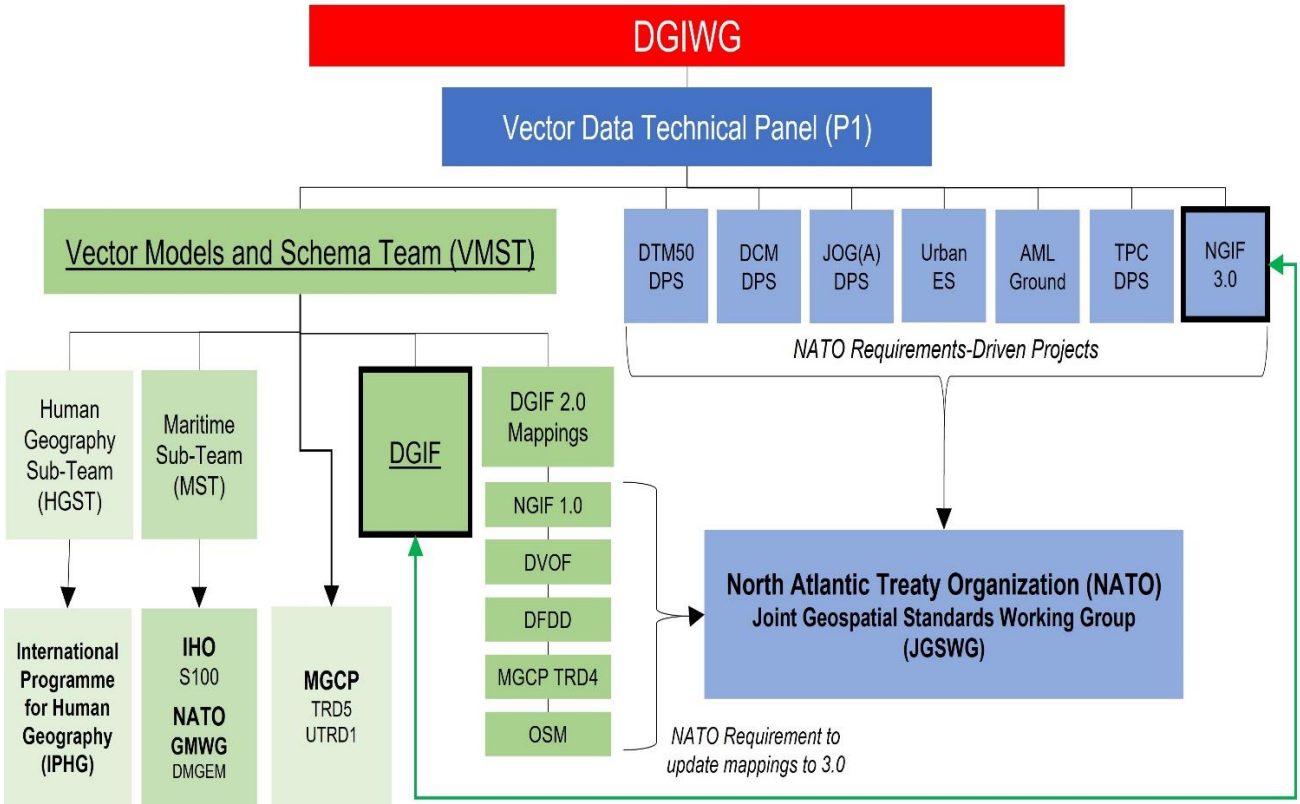

Figure 1: P1 Technical Panel Structure and Program of Work

6.1 The P1 is focused on the development and maintenance of the Defence Geospatial Information Framework (DGIF), its associated documentation and artifacts, and the standardised Digital Product Specification (DPS) derived from the DGIF.

6.2 Additional P1 goals include:

- Increasing interoperability and DGIF compliance or compatibility with national environments. VMST members provide a community through which national activities, experiences and resource can be shared to develop common solutions as well as receive and respond to implementer and user feedback.
- Aligning goals with international geospatial vector collection programs. A strong collaborative working relationship with Multinational Geospatial Collaboration Program (MGCP) and International Program for Human Geography Program (IPHG)[2] in achieving DGIF interoperability.

[2] The Multinational Geospatial Co-Production Program (MGCP) was created in April 2003 and currently has 35 participating members. The aim of the program is to collect geospatial data worldwide, concentrating on areas where little data currently exists. MGCP Data is collected in 1 by 1-degree cells of geographic coordinates at scales 1:50,000 and 1:100,000. MGCP have also initiated an Urban Vector Data capture program (MUVD). The International Program for Human Geography (IPHG) Is a co-production agreement between 12 member countries for the sharing of human geography data.

- Improving and maintaining interoperability with other geospatial data communities and domains. This includes forging strong collaborative relationships with the geospatial defence maritime and aeronautical communities.
- Developing and maintaining interoperability with other relevant programs, domains, communities, and open-source providers. This includes engaging with relevant other communities using or producing geospatial data to ensure its interoperability. These may be military, governmental or commercial open-source users/providers.
- Expanding and maintaining data model content in accordance with client requirements. Opportunities to expand/extend the model with new concepts for which use cases emerge, and the Defence Geospatial community wishes to exchange/utilise will be evaluated and holistic solutions applied to DGIF.
- Rationalising and enhancing model content in line with evolutions in technological use cases advances and new ways of working, while maintaining backwards compatibility. VMST will continue to work for efficiency in the model driven by emerging trends and implementers feedback. This is done through the formal DGIF change management process overseen and approved by the control body consisting of members from all DGIWG nations.
- Expanding the product specification and output portfolio. There is scope for developing DGIF compliant specifications to meet clients and end users' data output needs. This specification encompasses paper maps, digital maps and datasets, and are created as a cross panel and cross community endeavour.
- Enhancing DGIF user interaction and understanding. VMST will continue to develop new and improved artifacts, outputs and supporting documentation to present the DGIF Standard content, its usage and its processes.

6.3 The Vector Model Schema Team (VMST)

1.3.1 The VMST constitutes the core DGIF maintenance body within the P1. The VMST is responsible for maintaining and evolving DGIF content in a holistic manner via a formal configuration management process. Change proposals, can be developed internally to improve aspects of the model or they can be developed to address shortfalls in the current model needed to better address a user community requirement be that a client, community or individual nation. These change proposals are considered and voted upon by the membership before each new content baseline is produced. Three DGIF content baselines are produced per year and are distinguished by the year pr production and the production sequence. For example, DGIF baseline 2023-1 is the first baseline produced in 2023. The VMST also produces and maintains all DGIF supporting documentation and artifacts. VMST raises or maintains subgroups to progress specific areas of interests. This currently includes Maritime and Human Geography sub teams.

1.3.2 The VMST provides technical resources for deriving DGIWG-compliant technical artefacts to support many DGIWG product specifications. These artefacts are primarily schemas and feature catalogues.

1.3.3 Individual project teams are established on as-needed basis to develop or maintain data product specifications (DPS) to satisfy client requirements.

While DPS production is administered under P1, project teams call on resource across other DGIWG panels e.g., Metadata and Portrayal in their completion. Dedicated projects are allocated a unique P1 project reference number e.g., P1.07 or P1.08.

1.3.4 The P1 as a whole is responsible for the maintenance and update of many DGIWG published standards profiles and documents. A full list of these can be found in Annex A of this document.

7 Current and Planned Activities

This Section of the document contains a summary of the technical work being undertaken by P1.

7.1 Maintenance Work

The table below provides a list of current published artefacts P1 is updating or planning to update in the next 24 months.

Table 2: Table 2: P1 Published Artefacts in Maintenance

Doc ID [3]	Name	Task summary	Document type (Standard, Guidance note etc.)	Due Date
101	Profile of ISO 19131 - Geographic Information – Data Product Specification	Update of DGIWG 101 - Profile of ISO 19131 - Geographic Information - Data product specification to account for updates in the ISO19131 Standard	Standard	Jun-2023
200	Defence Geospatial Information Framework (DGIF) - Overview	Update Standard to reflect DGIF2.0 to DGIF3.0 Changes [Part of Project P1.07]	Standard	Feb-2024
200 SD3	Defence Geospatial Information Framework (DGIF) - Overview - SD3: MGCP TRD 4.x to DGIF v2.0	Update Mapping table to reflect DGIF2.0 to DGIF3.0 Changes [Part of Project P1.07]	Mapping Table	Feb-2024
200 SD4	Defence Geospatial Information Framework (DGIF) - Overview - SD4: OSM to DGIF v2.0	Update Mapping table to reflect DGIF2.0 to DGIF3.0 Changes [Part of Project P1.07]	Mapping Table	Feb-2024
200 SD5	Defence Geospatial Information Framework (DGIF) - Overview - SD5: Mapping Table DVOF to DGIF v2.0 with Cover	Update Mapping table to reflect DGIF2.0 to DGIF3.0 Changes [Part of Project P1.07]	Mapping Table	Feb-2024
205	Defence Geospatial Information Model (DGIM) -	Update Standard to reflect DGIF2.0 to DGIF3.0	Standard	Feb-2024

[3] Refence to published DGIWG Standards https://dgiwg.org/documents/dgiwg-standards

	Normative content workbook view	Changes [Part of Project P1.07]		
205 SD	Defence Geospatial Information Model (DGIM) - Normative content workbook view	Provide 3 scheduled updated baselines a year including establishing designated baseline as DGIF 3.0. [Part of Project P1.07]	Standard	Feb-2024
205 SD	Defence Geospatial Information Model (DGIM) - Normative content - Content UML view	Provide 3 scheduled updated offline model baseline a year including establishing designated baseline as DGIF 3.0. [Part of Project P1.07]	Standard	Feb-2024
206	Defence Geospatial Feature Concept Dictionary (DGFCD) Description and Content	Update Standard to reflect DGIF2.0 to DGIF3.0 Changes [Part of Project P1.07]	Standard	Feb-2024
207	Defence Geospatial Real World Object Index (DGRWI)	Update Standard to reflect DGIF2.0 to DGIF3.0 Changes [Part of Project P1.07]	Standard	Feb-2024
252	Defence Topographic Map for 1:50,000 Scale (DTM50) Data Product Specification (DPS)	Update Specification to reflect DGIF2.0 to DGIF3.0 Changes	Data Product Specification	Dec-2025
253 253 SD1 253 SD2 253 SD3	Defence Topographic Exchange (DTOX) Data Product Specification	Update Specification to reflect DGIF2.0 to DGIF3.0 Changes	Data Product Specification	Dec-2025
910	DGIWG Vector Roadmap	Update P1 Roadmap	Enterprise Document	Apr-2023

7.2 Development Work

The table below provides a summary of new standardisation tasks that P1 is currently engaged with or planning to work on in the next 24 months based on accepted and in-progress requirements.

Table 3: Table 3: P1 Development and Maintenance Projects

DGIWG Req. No.[4]	Task Name	Task Summary	Customer	Output *(Standard, Profile Guidance note, White paper etc.)*	Due Date
91	Human Geography Points of Interest Exchange Schema	Enhancement of DGIF and development of exchange schema to satisfy IPHG requirements for the collection and exchange of the IPHG POI Concept [Project P1.11]	IPHG	Data Product Specification, GML Schema, Feature Catalogue	Mar-2023
N/A	DGIF Handbook	Develop a Handbook for describing DGIF use guide, concept of operations, principles, and ways of working for non-DGIWG	DGIWG	Supporting Document	Dec-2023

[4] Reference number to the DGIWG Requirements Tracker

		participates. Proposed to be a new DGIWG 200 Supporting Document [Part of P1.07]			
79	DGIF 3.0/ NGIF 3.0 Content Development	Development and formalization of the next major version of DGIF. This major baseline will be published as DGIF 3.0. The primary driver is the requirement for formalizing NGIF 3.0 (NATO STANAG 2593) but will formalise and harmonize other key program requirements. This includes receiving and processing relevant National, MGCP, MUVD, IPHG, NATO JGSWG, NATO GMWG change requirements and proposals within the DGIF Information Model. Feedback from national and client DGIF implementations will also be evaluated. Feature level metadata requirement will also be evaluated. DGIF3.0 will also see the introduction of the Product Object (PO) Artifact into DGIF to support product development and delivery [VMST Maintenance Team]	DGIWG/ NATO	Standard Baseline	Dec-2023
69	Urban Exchange Schema	Development exchange schema for all urban features within DGIF [Project P1.06]	NATO	Data Product Specification, GML Schema, Feature Catalogue	Feb-2024
70	Defence City Map (DCM) – DGIWG-256	Development of a product specification for the DCM subset of DGIF urban features (cross panel) [Project P1.03]	NATO	Data Product Specification, GML Schema, Feature Catalogue	Jan-2024
78	Defence Joint Operations Graphic (Aeronautical) (DJOG(A)) – DGIWG 258	Development of an “internationalized” product specification based on the US national Joint Operations Graphic (Aeronautical) product (cross panel) [Project P1.05]	NATO	Data Product Specification, GML Schema, Feature Catalogue	Dec 2025
79	DGIF 2.0 to DGIF 3.0 Mapping Table	Develop Mapping Table to provide continuity and backwords compatibility between DGIF 2.0 and DGIF 3.0 [part of Project P1.07]	DGIWG/ NATO	Supporting Document	Jun-2024
87	Human Geography Data Exchange Specification	Enhancement of DGIF and development of exchange schemas to facilitate exchange of HG Data incorporating scope of IPHG Data. Includes enhanced Cultural Context	IPHG / DGIWG	Data Product Specification, GML Schema(s), Feature Catalogue	Feb-2024

		and Statistical Area data as well as POI content. [VMST Human Geography Subgroup]			
N/A	MUVD Data Product Specification	Development of a Data Exchange Specification for the MUVD v1 Schema [Project P1.10]	MGCP (MUVD)	Data Product Specification, GML Schema, Feature Catalogue	Oct-2023
68	S101 to DGIF Mapping	Provide a mapping of S101 Concepts to DGIF resolving gaps and concept alignment through the DGIF CP Process. [VMST Maritime Subgroup]	NATO GMWG	Supporting Document	Jan-2024

8 Emerging Concepts and Associate Standards

8.1 Overview

8.1.1 This section Identifies 'emerging' trends/concepts/technologies/standards currently outside of P1s requirements and scope but could have future impact. Accordingly, these external activities/developments regarding these identified trends are being monitored by P1 for potential new vector standards requirements needing support or impacts on current program of work, activities, direction, and resource. Trends can be considered medium term (2-5 years) or long term (6-10 years).

8.2 Trend - New Product Requirements/Developments

8.2.1 P1 manages the development of DGIF compliant Data Product Specifications (DPS) required by clients within DGIWG, as well as provide collaboration, support, verification and certification of external specifications in achieving DGIF compliance. The goal is to expand the portfolio of DGIF compliant product specifications in order to maximise interoperability of data exchange.

8.2.2 P1 continues to monitor and collaborate with other groups and organisations to identify new and emerging product specification requirements.

8.2.3 NATO Geospatial Aeronautical Working Group (GAWG) have indicated a requirement for Defence Tactical Pilotage Chart (TPC) Data Product Specification. This remains un-resourced within P1 and thus no activity is programed.

8.2.4 NATO Geospatial Requirements Working Group (GRWG) have also initialised a development of products for ground 'additional military layers. It is anticipated that the development of the schemas and specifications for these will be a requirement on P1/VMST and thus P1 is monitoring the GRWG Tiger Team activity.

8.2.5 These specification requirements are an evolving medium-term trend.

8.3 Trend - Alternative Vector Data Schema Formats

8.3.1 DGIF supports Geography Mark-Up Language (GML) as a primary format.[5] Schemas are produced in accordance with **DGIWIG 208 - Defence Geospatial Information Framework Encoding Specification - Part 1: GML** as default. VMST expect that it will become necessary to support mobile devices and to evaluate additional open standard exchange formats including GeoPackage[6], GeoJSON, JSON Schema, and JSON FG. [7]

8.3.2 DGIF is focused on machine-readable standards and deliverables that support maximum processes automation. An aim is to provide specifications not only as human-readable text files (i.e. .doc or .pdf) but also in XML.[8] Whilst symbols and symbol rules should be described in XML, derivate and business rules are defined in Object Constraint Language (OCL)[9].

8.3.3 Emerging technologies describing rules based on natural language and may be beneficial for DGIF in the future. These might include Resource Description Framework (RDF), Web Object Language (OWL), and SHACL, among others.

8.3.4 In order to ensure DGIF compliant Product Specifications and Schema remain relevant and usable to the Geospatial Community it needs to be evaluated as to whether DGIF outputs needs to be delivered in alternative formats, which ones are most applicable and what skills and processes need to be developed in VMST to meet such a demand.

8.3.5 This is an evolving medium-term trend with elements ready for adoption and other elements not yet ready for stabilization.

8.4 Trend - Linked Data

[5] Geography Markup Language (GML): is the XML grammar defined by the Open Geospatial Consortium (OGC) to express geographical features. GML serves as a modelling language for geographic systems as well as an open interchange format for geographic transactions. https://www.w3.org/Mobile/posdep/GMLIntroduction.html

[6] A GeoPackage is an open, standards-based, platform-independent, portable, self-describing, compact format for transferring geospatial information. The GeoPackage standard describes a set of conventions for storing the following within an SQLite database; vector features, tile matrix sets of imagery and raster maps at various scales, extensions https://www.ogc.org/standards/geopackage

[7] JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate https://www.json.org/json-en.html

[8] Extensible Markup Language (XML): is a markup language similar to HTML, but without predefined tags to use. Instead, you define your own tags designed specifically for your needs. This is a powerful way to store data in a format that can be stored, searched, and shared. https://developer.mozilla.org/en-US/docs/Web/XML/XML_introduction

[9] Object Constraint Language (OCL) is a formal language, developed by the Object Management Group (OMG) used to describe expressions on UML models. https://www.omg.org/

8.4.1 A key identified emerging technology is that of Linked Data. This involves the publishing of structured data that can be connected and linked together by machines.

8.4.2 Instead of having all data stored locally in one dataset, there is significant potential in linking to the source that initially produced the data, and to those who will keep the data up to date.

8.4.3 The P1 does not current expect DGIF to be evolved into a model supporting a Linked Data construct; however, DGIF-compliant data may eventually be required to integrate/link into such a construct.

8.4.4 Research and an understanding of semantic technology, knowledge graphs, and Linked Data standards such as Resource Description Framework (RDF)[10], Web Ontology Language (OWL)[11], Friend of a Friend ontology (FOAF)[12] and SPARQL Protocol and RDF Query Language (SPARQL)[13] would be required to achieve this. The JSON-LD and JSON-FG candidate standards may identify further development trajectories that would impact how this technology impacts a Defence Geospatial Reference Architecture.

8.4.5 This is an evolving medium-term trend with element ready for adoption and other elements not yet ready for stabilization.

8.5 Trend - OGC Points of Interest Standard Working Group

8.5.1 The Open Geospatial Consortium (OGC) established a Points of Interest (PoI) Standards Working Group to produce an encoding standard of points of interest data that includes an abstract data model and JSON implementations of that data model.[14] Within OGC a “point of interest” (PoI) is a location for which information is available. A PoI can be as simple as a set of coordinates, a name and a unique identifier, or more complex such as a three-dimensional model of a building with names in multiple languages information about opening and closing hours, and a civic address.

8.5.2 While DGIF is responding to an IPHG ‘Points of Interest’ requirement, this is independent to the OGC development work and definition.

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[10] Resource Description Framework (RDF) is a standard model, developed by the World Wide Web Consortium (W3C), for data interchange on the Web https://www.w3.org/RDF/

[11] Web Ontology Language (OWL) is a Semantic Web language, developed by the World Wide Web Consortium (W3C), designed to represent rich and complex knowledge about things, groups of things, and relations between things. https://www.w3.org/OWL/

[12] http://xmlns.com/foaf/0.1/

[13] GeoSPARQL - A Geographic Query Language for RDF Data. The OGC GeoSPARQL standard supports representing and querying geospatial data on the Semantic Web

[14] OGC Points of Interest SWG https://www.ogc.org/projects/groups/poiswg

8.5.3 However, given that the OGC PoI use cases include the search and delivery of location-based information for mapping and navigation and aspects such as financial institutions, accommodations, retail shops, transportation and services, VMST notes considerable overlap with IPHG data and NATO “additional military layer” requirements as well as existing DGIF concepts. As such, VMST will monitor this trend and ensure outputs are consistent or compatible with this standard.

8.5.4 In November 2022, OGC announced the completion of a draft UML Conceptual Model for POI and a draft JSON Schema for the POI Conceptual Model.[15]

8.5.5 This is an evolving medium-term trend with element ready for adoption.

[15] The draft POI Specification and data model can be found at https://github.com/opengeospatial/poi/tree/main/21-049

ANNEX A Artefact Responsibility

Table A1 contains a list of completed DGIWG documents and artefacts that the P1 is responsible for maintaining As of March 2023. *(Note this table is extracted from the DGIWG PoW and should not be updated in isolation)*

Table 4: Table A 1: Artefacts for which P1 is responsible

DGIWG Number[16]	Title	Edition	Artifact Type/Format	Current Edition Date	Description
101	Profile of ISO 19131 - Geographic Information - Data product specification	1.0.0	PDF	2018-04-05	This is a descriptive profile of the ISO 19131:2007/Amd.1:2011 Geographic information -- Data product specifications. Its purpose is to define military requirements for the specification of data products and provide guidance for the creation of such data product specifications.
200	Defence Geospatial Information Framework (DGIF) - Overview	2.0.0	PDF	2017-11-28	This document gives an overview on all DGIF artifacts, deliverables and specification and defines basic and conformance classes for DGIF in the area of geospatial vector data.
200 SD1	Defence Geospatial Information Framework (DGIF) - Overview - SD1: NGIF v1.0 to DGIF v2.0	1.0	PDF	2017-11-03	Mapping table from NGIF 1.0 to DGIF 2.0
200 SD2	Defence Geospatial Information Framework (DGIF) - Overview - SD2: DFDD 2013-1 to DGIF v2.0	1.0	XLS	2017-11-03	Mapping table from DFDD 2013-1 to DGIF 2.0
200 SD3	Defence Geospatial Information Framework (DGIF) - Overview - SD3: MGCP TRD 4.x to DGIF v2.0	1.0	XLS	2017-11-03	Mapping table from MGCP TRD4 to DGIF 2.0
200 SD4	Defence Geospatial Information Framework (DGIF) - Overview - SD4: OSM to DGIF v2.0	1.0	XLS	2019-08-12	Mapping table from Open Street Map (OSM) to DGIF 2.0
200 SD5	Defence Geospatial Information Framework (DGIF) - Overview - SD5: Mapping Table DVOF to DGIF v2.0 with Cover	1.0	XLS	2019-10-16	Mapping table from Digital Vertical Obstruction File (DVOF) to DGIF 2.0

[16] Refence to published DGIWG Standards https://dgiwg.org/documents/dgiwg-standards

205	Defence Geospatial Information Model (DGIM)	2.0.0	PDF	2017-11-28	This standard provides information on the purpose and structure of data within the Defence Geospatial Information Model (DGIM) part of the Defence Geospatial Information Framework (DGIF)
205 SD	Defence Geospatial Information Model (DGIM) - Normative content workbook view	Various	XLS	Various	A workbook view of the DGIF Geospatial Information Model (DGIM). VMST publish three baselines per annum maintaining a current version.
205 SD	Defence Geospatial Information Model (DGIM) - Normative content - Content UML view	Various	EAP	Various	An offline UML view of the DGIF Geospatial Information Model (DGIM). VMST publish three baselines per annum maintaining a current version.
206	Defence Geospatial Feature Concept Dictionary (DGFCD) Description and Content	2.0.0	PDF	2017-11-28	This standard provides information on the purpose and structure for the registration of geospatial phenomena within the Defence Geospatial Feature Concept Dictionary (DGFCD), part of the Defence Geospatial Information Framework (DGIF).
207	Defence Geospatial Real World Object Index (DGRWI)	2.0.0	PDF	2017-11-28	This standard provides information on the purpose and structure of data within the Defence Geospatial Real World Object Index (DGRWI) as part of the Defence Geospatial Information Framework (DGIF).
208	Defence Geospatial Information Framework Encoding Specification - Part 1: GML	2.0.0	PDF	2017-11-28	This document describes a schema using the Geography Markup Language for exchanging data for application schemas of the Defense Geospatial Information Model.
252	Defence Topographic Map for 1:50,000 Scale (DTM50) Data Product Specification (DPS)	1.1	PDF	2023-xx-xx	this document is to describe the content and arrangement of a Defence Topographic Map for 1:50,000 Scale (DTM50). A DTM50 is a hardcopy map characterized by a high level of planimetric detail and quantitative representation of relief using elevation contour lines. The various features shown on the map are represented by standard symbols
253	Defence Topographic Exchange (DTOX) Data Product Specification (DPS)	1.0	PDF	2018-06-26	This is a data product specification describing the exchange of basic topographic vector data from a GML application schema, derived from Defence Geospatial Information Framework (DGIF).

253 SD1	Defence Topographic Exchange (DTOX) Data Product Specification (DPS) - SD1: GML Application Schema	1.0	GML Schema	2018-06-26	DTOX GML Application Schema
253 SD2	Defence Topographic Exchange (DTOX) Data Product Specification (DPS) - SD2: Metadata Schema	1.0	XML Schema	2018-06-26	DTOX Metadata Schema
253 SD3	Defence Topographic Exchange (DTOX) Data Product Specification (DPS) - SD3: Feature Catalogue	1.0	HTML	2018-06-26	DTOX Feature Catalogue
260	International Program for Human Geography (IPHG) Data Product Specification (DPS)	1.0	PDF	2022-02-28	This Data Product Specification (DPS) describes the requirements for defining and exchanging standardised geospatial vector data covering the Cultural Context and Statistical Extent Locations as set out by the International Program for Human Geography (IPHG).
260 SD1	IPHG DPS - SD 1 CCL GML Application Schema	1.0	GML Schema	2022-02-28	IPHG Cultural Context Location (CCL) Application Schema
260 SD2	IPHG DPS - SD 2 SEL GML Application Schema	1.0	GML Schema	2022-02-28	IPHG Statistical Extent Location (SEL) Application Schema
260 SD3	IPHG DPS - SD 3 Metadata Schema	1.0	XML Schema	2022-02-28	IPHG Cultural Context Location (CCL) Statistical Extent Location (SEL) Metadata Schema
260 SD4	IPHG DPS - SD 4 Data Feature Catalogue	1.0	HTML	2022-02-28	IPHG Cultural Context Location (CCL) Statistical Extent Location (SEL) Feature Catalogue
910	DGIWG Vector Roadmap	1.0.0	PDF	2019-09-16	The Vector Roadmap captures needs for the generation of standards and product specifications that facilitate the efficient exchange of vector-based geospatial information and products across the defence user communities. It defines the strategies and direction that ensures target level of interoperability are achieve across the producer and user communities