CHARTER

World Geodetic System and Geomatics (WGSG) Focus Group

of the

Geospatial Intelligence Standards Working Group (GWG)

8 August 2011

World Geodetic System and Geomatics (WGSG) Charter

1. PURPOSE

1.1. Charter: The purpose of this charter is to establish the World Geodetic System and Geomatics (WGSG) Focus Group of the Geospatial Intelligence Standards Working Group (GWG).

1.2. World Geodetic System and Geomatics Focus Group (WGSG): The purpose of the WGSG is to serve as a National System for Geospatial-Intelligence (NSG) community-based forum to advocate for and manage the standardization of the World Geodetic System and for activities related to its implementation which enable the provision of timely, relevant, and accurate geo-referenced data and information.

2. BACKGROUND

2.1. The Department of Defense (DoD) World Geodetic System (WGS) is a set of conventions, parameters, and geophysical models that define a geodetic coordinate reference system for the Earth. The various models and conventions tie the basic geometric coordinate systems to the dynamic physical living world. The values that define these ties require constant monitoring, analysis, and updating to account for the dynamic nature of the Earth and its physical changes. Some of the specific standards types that will be managed by this group are:

2.1.1. WGS reference frame, coordinate system, and datum transformations.

2.1.2. The Earth Gravitational Models (EGM) developed for the WGS to include all derived or modeled quantities such as the geoid and deflection of the vertical components.

2.1.3. World Magnetic Model (WMM)

2.1.4. Geodetic parameters of the various geodetic models (e.g. WGS ellipsoidal parameters).

2.2. Geomatics is a discipline that integrates data collection, modeling, analysis, and the management of spatially referenced data based on the scientific framework of geodesy, geophysics, geotechnical analysis, photogrammetry, orbital sciences, and topographic and bathymetric sciences. Some of the data types for which standards will be developed include:

2.2.1. Global Positioning System (GPS) Precise Ephemeris information

2.2.2. GPS Navigation message replacement standards

2.2.3. Geodetic Survey Standards

2.2.4. Geotechnical Standards

2.2.5. Accuracy and positioning standards

2.2.6. Geopositioning content and data for:

2.2.6.1. Controlled imagery accuracy standards

2.2.6.2. Elevation and Bathymetry accuracy standards[1]

3. SCOPE

The WGSG will deal with those aspects of GEOINT standardization relating to the WGS and Geomatics information, products, and services. Standardizing the content and structure of the related data and models will provide creators the appropriate information to effectively apply and integrate into existing and emerging navigation and weapon systems. Furthermore, standardizing the implementation of this information will assist users in achieving interoperability of information, products, and services across the NSG. The WGSG will coordinate activities between the various recognized organizations and will assume a leading role in the development of standardized WGS and Geomatics data across the NSG.

4. MISSION

The mission of the WGSG is to serve as a conduit for information and coordination related to WGS and Geomatics activities within the NSG community and to identify existing and future requirements for the standardization of WGS and Geomatics. The WGSG will identify and resolve issues related to the development of information, products, and services which are dependent on WGS and the Geomatics.

5. REFERENCES

5.1. Policy and Guidance References

5.1.1. GEOINT Publication 1 – Geospatial Intelligence

5.1.2. Charter of the GEOINT Standards Working Group (GWG)

5.2. WGS and Geomatics Technical References

5.2.1. CJCSI 3900.01C, Position (Point and Area) Reference Procedures

5.2.2. DODI 5000.56, Programming GEOINT, GI&S, and Geodesy Requirements for Developing Systems

5.2.3. MIL-STD-2401, Department of Defense World Geodetic System (WGS)

5.2.4. STANAG 2211 Ed 6, Geodetic datums, projections, grids and grid references

5.2.5. MIL-W-89500, World Magnetic Model (WMM)

5.2.6. STANAG 7172 Ed 2, Use of geomagnetic models

5.2.7. STANAG 2577 Ratification Draft 1, Global Area Reference System (GARS)

5.2.8. TR8350.2, WGS Technical Report

5.2.9. TM8358.1, Datum's, Ellipsoids, Grids, and Grid Reference Systems

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[1] Only static models are being considered at this time. Dynamic tidal constituents and models will be addressed at a later date.

5.2.10. TM8358.2, The Universal Grids: Universal Transverse Mercator (UTM) and Universal Polar Stereographic (UPS)

5.2.11. TR8400.1, Error theory as applied to Mapping, Charting and Geodesy

5.2.12. MSP GEOTRANS 3.1 (Geographic Translator) MSP GEOTRANS 3.1 (Geographic Translator)

6. ORGANIZATION

The WGSG will follow the basic organization established by the Geospatial Intelligence Standards Working Group (GWG).

6.1. Chair: The National Geospatial-Intelligence Agency (NGA) will provide a chairperson to head the WGSG. The Chair has the responsibility to include:

6.1.1. Represent the WGSG at all meetings of the GWG and other related forums as required.

6.1.2. Establish and oversee standing and ad-hoc subgroups that conduct specific tasks or perform special studies in support of the WGSG as required. Each subgroup has a Chair who reports to the WGSG Chair.

6.1.3. Maintain close communication and coordination with the GWG Chair and the GWG Standing and Ad Hoc Focus Groups having interest in the activities of the WGSG.

6.1.4. Define and coordinate the level of Secretariat and administrative support for the WGSG, and any WGSG Standing or Ad Hoc subgroup required to facilitate the execution and management of WGSG work items.

6.1.5. Coordinate the agenda for WGSG meetings, WGSG and subgroup work, and the execution of all WGSG business.

6.1.6. Serve as meeting lead, encourages consensus-building and teamwork among WGSG membership.

6.1.7. Assign an Alternate Chair to act in the Chair's absence or on the Chair's behalf, as required or assigned by the Chair.

6.2. Members:

6.2.1. Member organizations of the GWG may participate in the WGSG if they have an interest or expertise in the subject matter, or designate alternates to represent them.

6.2.2. Participation in the WGSG is open to the Department of Defense (DOD), other Intelligence Community (IC) organizations, Federal and civil agencies, coalition partners, international organizations, and commercial organizations. All voices will be heard. While no voting is expected to occur in the WGSG, the WGSG Chair and members may request that each participating member organization designate a primary and alternate representative who has the authority to speak on behalf of his/her member organization.

6.2.3. Non-GWG member organizations may participate on an ad-hoc basis in WGSG activities when their participation is mutually beneficial. WGSG members may invite guest participants as required to support the WGSG. Non-GWG member organizations are also eligible and encouraged to apply for GWG membership as appropriate.

7. FUNCTIONS and RESPONSIBILITIES

7.1. Advise the NSG members and partners on matters relating to the implementation and use of WGS and Geomatics standards.

7.2. Lead the coordination and assessment of applicable WGS and Geomatics standards and guidance documents within the NSG; and recommend respective standards for inclusion into the DISR and ICSR as appropriate.

7.3. Maintain the WGS 84 and associated implementation guides.

7.4. Develop and maintain documentation related to the field and application of the principles of Geomatics which enable accurate and timely geo-referenced data and information.

7.5. Develop, publish, and maintain NGA's NSG geodesy and geophysics standards and implementation guides.

7.6. Identify and report major changes in the Geomatics discipline that could affect the scientific scope of the WGSG.

7.7. Define conformance criteria/measures for standards and specification.

8. PROCEDURES

8.1. Convene as a working group as needed. Generally meetings will be scheduled to correspond with scheduled GWG general meetings, or to support the DISR/ICSR, , registry baseline schedules, typically updated three times a year. The Chair or members may request additional meetings, if they are required to address a particular issue that cannot be considered during regular meetings, due to urgency, complexity, or other extraordinary factors.

8.2. Provide recommendations to the GWG and serve as the technical experts that sponsor to the GWG the WGSG standards change requests for GWG voting recommendations for citation in the DISR/ICSR.

8.3. Prepare and provide status reports on the progress of the WGSG program of work to the GWG Plenary, typically held twice a year. (Chair or designated appointee)

8.4. Participate in reoccurring GWG Focus Group Chairs planning meetings held bi-weekly. Typically the responsibility of the Chair or designated appointee. (Chair or designated appointee)

8.5. Manage WGSG membership rosters, distribution lists, and content on the GWG web site (http://www.gwg.nga.mil) and/or the GWG members web site, and communicate with the GWG community as appropriate.

8.6. Document working group procedures and practices in an WGSG Standard Operating Procedures (SOP). The WGSG SOP will be developed and maintained by the WGSG members.

8.7. The WGSG shall review this charter every three years or more often as changes dictate, and WGSG core members shall approve revisions, as necessary to ensure adequate continuity and appropriateness.

Approved:

Richard D Salman — 9 August 2011

WGSG Focus Group Chair Signature — Date

Gregory Black — 8/17/11

GWG Chair Signature — Date

Annex A

DEFINITIONS

1. **data**: Data collection of symbolically or numerically recorded information such as measurements, and derived information, such as summaries and statistics intended for analysis.

2. **datum transformation:** A datum transformation is a mathematical model that can transform from one geodetic datum to another using a mathematical model, such as the Seven Parameter Transformation:

   - three translation parameters (dx, dy, dz)
   - three rotation parameter (θx, θy, θz)
   - one scale factor (s)

3. **geodesy:** A literal meaning of GEODESY is "dividing the earth." Geodesy includes both science and art:

   - Science of geodesy is devoted to:
     - Determining size and shape of the earth.
     - Defining and quantifying gravity field of earth.
     - Defining reference frames and coordinate systems.
   - Art of geodesy utilizes scientific data to:
     - Obtain latitude/longitude/height of points.
     - Compute trajectories of satellites, missiles etc.
   - Fields of Geodesy
     - **geometrical**: Geometrical geodesy is concerned with the three dimensional geometrical elements of the mathematical model of the earth.
     - **physical**: Physical geodesy relates the geophysical internal constitution of the arth to the corresponding gravity field and its observable effects.
     - **satellite**: Satellite geodesy deals with satellite orbits, tracks existing satellites, and predicts the trajectory of a given missile, satellite, or spacecraft.
     - **geodetic astronomy**: Geodetic astronomy chronicles the changing position of stars and other celestial objects. Although listed separately, it overlaps other areas of geodesy and will not be pursued separately here.

4. **geodetic datum**: Geodetic datum is defined as "A set of constants specifying the coordinate system for a collection of points on the Earth surface."

5. **geospatial information**: Information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth, including statistical data; information derived from, among other things, remote sensing, mapping, and surveying technologies; and mapping, charting, and geodetic data, including "geodetic products."

6. **geospatial intelligence**: The exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the earth

7. **National System for Geospatial Intelligence (NSG)**: The combination of technology, policies, capabilities, doctrine, activities, people, data, and communities

necessary to produce geospatial intelligence in an integrated multi-intelligence, multi-security domain environment

8. **reference frame**: A coordinate system or set of axes within which to measure the position, orientation, and other properties of objects in it, or it may refer to an observational reference frame tied to the state of motion of an observer.