NUAF-B

USIGS Architecture Framework

23 June 1998

PREFACE

The National Imagery and Mapping Agency (NIMA) has developed, and is in the process of evolving, an Architecture for the United States Imagery and Geospatial Information System (USIGS). Migration from the current multitude of separated systems towards a single, integrated, virtual system is the goal of NIMA and the purpose of the Architecture. The USIGS will support requirements from the Imagery and Geospatial Community (IGC) for the acquisition and production of imagery, imagery intelligence, and geospatial information. The implementation of the USIGS Architecture will improve customer access to this information as it migrates from the current production, storage, and distribution system(s), based mostly on hardcopy media, to a system based predominantly on digital technology and softcopy production.

The USIGS Architecture Framework (UAF) is the first step to instantiate a USIGS Architecture compliant with the Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Architecture Framework. The UAF implements direction from DoD 8000.1, section 4.2.11, which requires a set of operational, technical, and system architectures be developed and applied, in order to achieve a common operating environment for the Defense Information Infrastructure (DII). The UAF provides a common framework of terminology and documentation of architecture components guiding the building of a "USIGS Architecture. Finally, the UAF defines how architecture products will be used in the Planning, Programming and Budgeting Systems, as well as, requirements and acquisition processes.

This iteration of the *USIGS Architecture Framework* reflects changes made to the previous version of the document, which include the following:

- Improved descriptions of architecture product relationships
- Removal of IDEF0 diagrams and addition of Use-Case diagrams in the Operational Architecture
- Refined System Architecture "To-Be" products
- Renaming and improved description of USIGS Conceptual Data Model
- Addition of section covering USIGS Compliance, including a Compliance Checklist
- Improved alignment of USIGS Architecture Framework to the C4ISR Architecture Framework version 2.0

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Section 1

OVERVIEW AND SUMMARY INFORMATION

1.1 Purpose of the USIGS Architecture Framework (UAF)

The United States Imagery and Geospatial Information System (USIGS) Architecture Framework document (UAF) provides a common framework of terminology and products needed to build the USIGS Architecture. The UAF implements the principles established in the *Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Architecture Framework* to ensure an interoperable imagery, imagery intelligence, and geospatial information system. The UAF responds to the Director of NIMA's responsibility to establish a system of end-to-end architectures related to imagery, imagery intelligence, and geospatial information, in compliance with National and Defense Information Infrastructure guidance and standards. In addition, the document aids the Director in his efforts to prescribe and mandate standards and end-to-end technical architectures related to imagery, imagery intelligence, and geospatial information for the DoD Components and for the non-DoD elements of the Intelligence Community. The UAF supports NIMA's role as a Combat Support Agency, as established in DoD Directive 5105.60, the National Imagery and Mapping Agency (NIMA). The UAF also provides for the development of an integrated set of operational, system and technical architectures which will be applied to determine interoperability requirements, promote standards and security, and achieve a common operating environment as part of the Defense Information Infrastructure, and in compliance with DoDD 8000.1, Management of Information and Information Technology.

1.1.1 Developing the USIGS Architecture

Joint Vision 2010 provides a conceptual template for channeling resources and technology to achieve new levels of effectiveness in joint warfighting. The template is focused on achieving dominance across the range of military operations through the application of new operational concepts; it provides a common direction for the Services in developing their unique capabilities within a joint framework of doctrine and programs as they prepare to meet the challenges and uncertainties of the future. Central to this vision of future warfighting are improvements in intelligence and command and control, which will provide the capability to gain the advantage over any adversary through achievement of information superiority: the capability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying the adversary's ability to do the same.

Two terms have been developed to assist in providing a context for architecture descriptions regarding the execution of the Director's responsibilities within NIMA, and the imagery and mapping community at large.

- **Imagery and Geospatial Community (IGC)**: The composition of cooperating commands, services, agencies, and departments within the United States government, foreign governments, and private sector organizations involved in the acquisition, production and exploitation, and dissemination of imagery, imagery intelligence, and geospatial information. The IGC fosters extensive partnerships with others, including commercial and academic institutions, to collaboratively work together to share information.
- **United States Imagery and Geospatial Information System (USIGS)**: The extensive network of systems used by the Department of Defense (DoD) and the Intelligence Community that share and exploit imagery, imagery intelligence, and geospatial information. These systems provide capabilities involved with the integrated management, collection, production, exploitation, dissemination and archive, and infrastructure of this information. Organizations which have some level of interface with USIGS, but are not part of DoD and the Intelligence Community, are considered participants in USIGS if they adhere to the technical and system standards.

The *C4ISR Framework* defines a common approach to ensure that the architecture descriptions developed by the Commands, Services, and Agencies are interrelatable between and among each organization's operational, systems, and technical architecture views. This also ensures architecture views are comparable and integratable across joint and combined organizational boundaries. It provides guidelines and defines a process that can be used across DoD, and by the IGC for developing architectures which focus support to the military, civil, and national customers. Use of the framework by DoD and IGC organizations ensures a common denominator for understanding, comparing, contrasting, and integrating architectures and is intended to bridge both current capabilities and future improvements. Application of this framework will also help evolve the USIGS toward a seamless, interoperable, common operating environment; gradually improving imagery and geospatial support to military, civil, and national customers.

As an implementation of the *C4ISR Framework* for USIGS, the *USIGS Architecture Framework* will assist NIMA and the IGC in accomplishing complementary and interoperable strategic planning. It will also provide a coherent approach for applying strategic direction and process improvements to the USIGS Architecture. This will enable functional managers to play a more visible and proactive role in contributing to USIGS Architecture improvements.

The UAF also provides a means of evaluating the validity of architecture descriptions. By looking at several specific examples of operational need scenarios and tracking their processes (threads) through the described architecture(s), NIMA and the IGC can demonstrate, in a real-world sense, the validity of their architecture.

1.1.2 Integrating USIGS Architecture with C4ISR Architectures

An important goal of the UAF is an ability to integrate USIGS Architecture with C4ISR architectures. The USIGS and IGC are composed of multiple suppliers, producers, and customers operating within, and across, all levels of the DoD, intelligence, civil, corporate, and academic communities. These participants tend to have unique perspectives on how they interact with each other. Their unique missions and focus make it difficult to find a "common denominator" or even a common authority for easily reconciling conflicts among the various architectures.

Today, and in the near future, integration will probably be accomplished toward the lower end of the integration continuum. This means that the USIGS and other architectures (whether prepared by one organization or many organizations) will be built against a common *C4ISR Framework* that is sufficiently uniform (or similar) to enable critical relationships to be identified, thereby at least setting the stage for further integration. In the future the USIGS Architecture seeks to achieve higher end integration, so that various architectures can be intertwined, or plugged together, into a single physical and logical representation.

1.2 Scope of the USIGS Architecture

An architecture is required to guide the establishment of minimum-essential controls and guidelines in ways that enhance, rather than constrain, the effectiveness of USIGS in meeting its critical support responsibilities. The USIGS Architecture defines the structure of components, their relationships, and the principles and guidelines governing their design and evolution over time. There is an interrelated set of USIGS Architecture views which include the Operational Architecture, the Technical Architecture, the System Architecture, and Conceptual Data Model. Each of these views is, in turn, described by its own specific products.

While the UAF provides direction on how to describe the USIGS Architecture; it does not provide guidance in how to design or implement a specific architecture component or how to develop and acquire a

system of systems.

1.2.1 Architecture Component Views and Products

Operational Architecture products identify operational elements, activities, and information flows. Technical Architecture products identify applicable standards and conventions. System Architecture products overlay requirements and identified standards to map current and future capabilities. The Conceptual Data Model provides the common data modeling and terminology baseline needed to articulate and integrate the other component architecture views. This document discusses the USIGS Architecture components, their roles and relationships, and identifies architecture products which need to be developed to define and evolve an integrated, interoperable USIGS. An overview of USIGS Architecture components is shown in Figure 1-1.

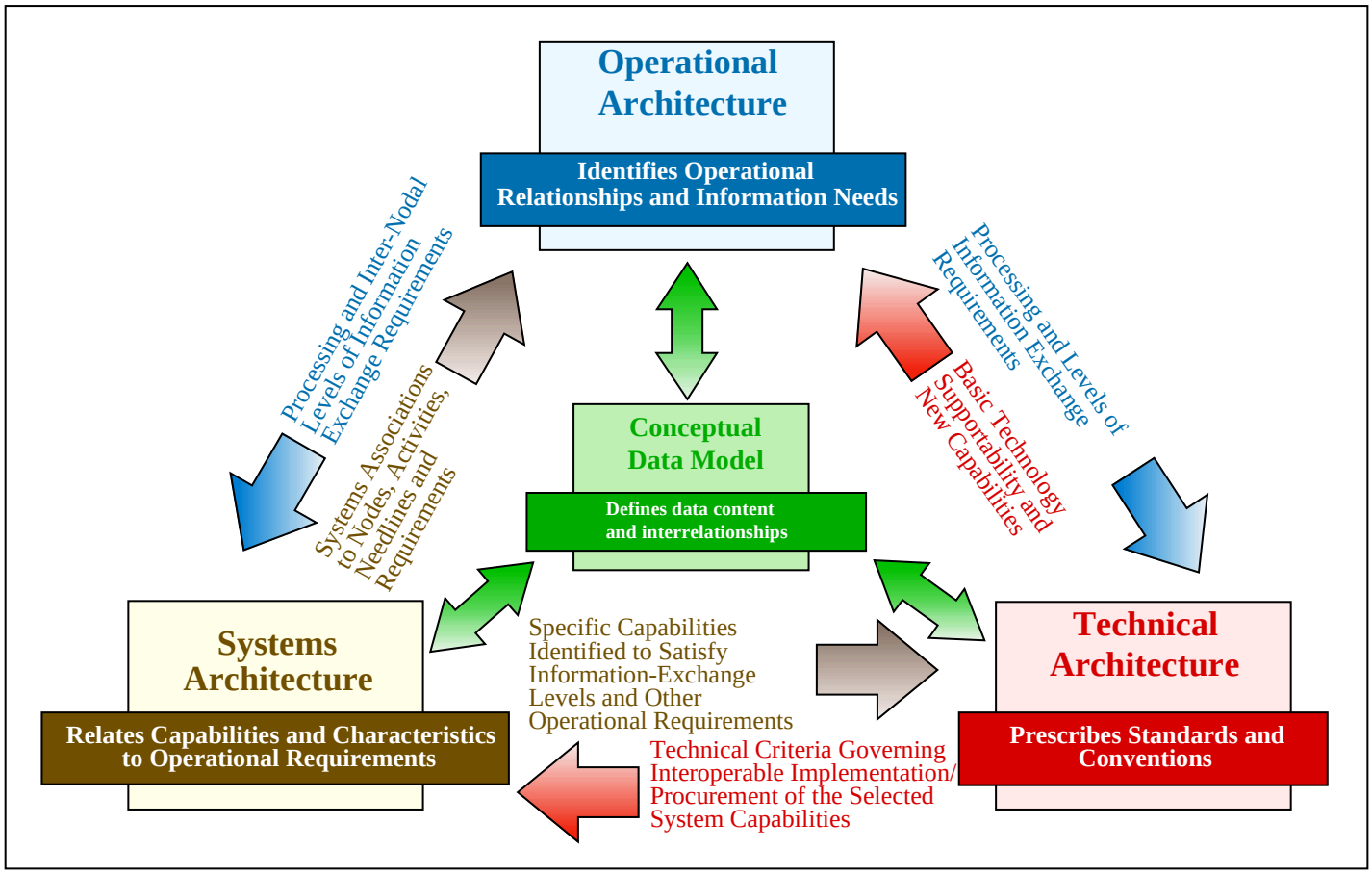


Figure 1-1 USIGS Architecture Components

The following definitions are useful in providing a clear context for the UAF:

- **Architecture**: The structure of components, their relationships, and the principles and guidelines governing their design and evolution over time.
- **Operational Architecture**: Descriptions of the tasks, operational elements, and information flows required to accomplish or support warfighting, National Security, and civil functions.
- **System Architecture**: Descriptions (often graphical) of systems and interconnections providing for or supporting warfighting, National Security, and civil functions.
- **Technical Architecture**: A minimum set of rules governing the arrangement, interaction, and interdependence of the parts or elements whose purpose is to ensure that a conformant system satisfies a specified set of requirements.
- **Conceptual Data Model**: The relationship and definitions of all data that is used by and influences the other three architecture components - operational, systems, and technical.

The UAF contains a tailored set of USIGS architecture products that has been identified for each Architecture component, as derived from the *C4ISR* approach. These products present architectural information in a consistent way to serve as a foundation for the analysis, definition, and migration of the USIGS Architecture. Note that in Figure 1-2, the UAF expands upon the *C4ISR Architecture Framework* by separating Migration Planning products from the System Architecture.

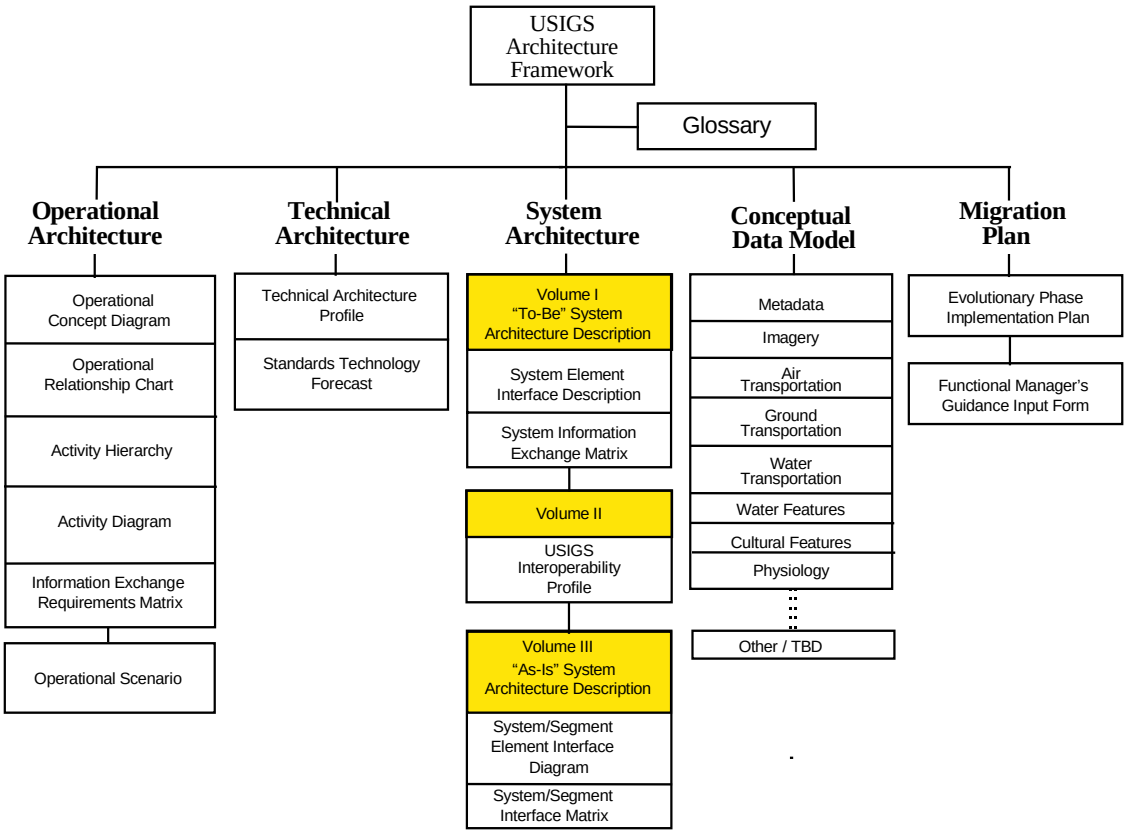


Figure 1-2 USIGS Architecture Products

The Architecture products included in the UAF is classified into two categories, namely:

- Essential Products which facilitate the development and integration of architectures within and across organizational boundaries and between USIGS and multi-national elements of the IGC;
- Supporting Products which provide additional, supporting data that may sometimes be needed to supplement the essential products.

Use of these categories will allow USIGS architects to capture most of the characteristics needed for their analysis efforts, as well as satisfying Joint and multi-national analysis needs. (Appendix II maps these categories to USIGS Architecture products). UAF products also enable the integration of the architecture components. In this context, integration aids analysis by making it easier to identify architectural linkages. It also provides a general characterization of top-level document input and output dependencies.

UAF products directly support all phases of architecture analysis, definition, and migration. This includes contributions to the requirements process, the planning process, resource management, the acquisition process, and community interaction. Figure 1-3 relates the potential contribution of UAF "product" to selected USIGS and IGC processes, types of documents, and community activities. It is important to note that UAF products influence, and are influenced by, significant IGC, DoD, and IC activities and documents.

	Planning Process		Requirements Process			Resource Management		Acquisition Process					Community Interaction								
	Business Plan	Investment Strategy	Mission Need Statements	CRD	ORD	Functional Mgr's Guidance	POM Initiatives	Requirements Documents	System Specifications	Statement of Work	Interface Control Documents	Requests for Change	FIA	JIVA	JTA	SHADE	DODIIS	CIAP	CIG/SS	IC Strategic Plan	DII COE
Operational Concept Diagram	M	M		M	M	G						G	D	D	D	D	D		D	D	D
Operational Relationship Chart	M	M		M	M	G						G	D	D	D	D	D		D	D	
Activity Hierarchy	M	M		M	M	G		G				G	D	D	D	D	D	D	D	D	
Activity Diagram	M	M		M	M	G		G				G	D	D	D	D	D	D	D	D	
Information Exchange Requirements Matrix	M	G		M	M	G		G				G	D	D	D	D	D	D	D	D	
Operational Scenario	G	G		G	G	G		G					D	D	D		D			D	
Technical Architecture Profile		M		M	M	G	G	M	M	M	M	M		D	D	D	D	D	D	D	D
Standards Technology Forecast		G			G		G	G	G	G	G	G		D	D	D	D	D	D	D	D
Glossary	M	M	M	M	M	M	M	M	M	M	M	M	D		D	D	D		D	D	D
System Element Interface Description (Vol. I)	M	M	M	M	M	M	M	M	M	M	M	M	D	D	D		D		D	D	D
System Information Exchange Matrix (Vol. I)	M	M	M	M	M	M	M	M	M	M	M	M	D	D	D		D		D	D	D
USIGS Interoperability Profile (Vol. II)	G	G		M	M	G	G	M	M	M	M	M	D		D	D	D	D		D	D
System/Segment Element Interface Diagram (Vol. III)	G	G		G	G	G	G	G	G	G	G	G	D	D	D		D		D		D
System/Segment Interface Matrix (Vol. III)	G	G		G	G	G	G	M	M	M	M	M	D	D	D		D		D		D
USIGS Conceptual Data Model	G	G		M	M	G	G	M	M	M	M	M	D		D	D	D	D	D	D	D
EPIP	M	M	M	M	M	M	M	M	M	M	M	M	D	D	D	D	D	D	D	D	D
Functional Manager's Guidance Input Form	M	M		G	G	M	M	M	M	M					D	D				D	D

NOTE: "M" - Mandatory; USIGS products must be considered in this process
"G" - Guidance; USIGS products should be considered in this process
"D" - Dependent; USIGS products are influenced by this community source

Figure 1-3 USIGS Architecture Product Process Impact Matrix

1.2.2 Architecture Time Frames

The evolution of the USIGS Architecture is an iterative process of analysis, definition, and migration. UAF products are intended to influence the cyclical planning, programming, and budgeting process. This requires that Architecture products be able to support the capability to view the USIGS in "As-Is" and "To-Be" perspectives. For the purposes of the UAF, the "As-Is" time frame generally describes the present situation, and the "To-Be" is the end of the current FYDP. Effective System Architecture planning is the key to overcoming the gaps, redundancies, issues, and shortfalls identified during architectural analysis and definition phases. Migration planning links the "As-Is" and "To-Be" perspectives. Figure 1-4 illustrates the factors involved in USIGS Architecture evolution.

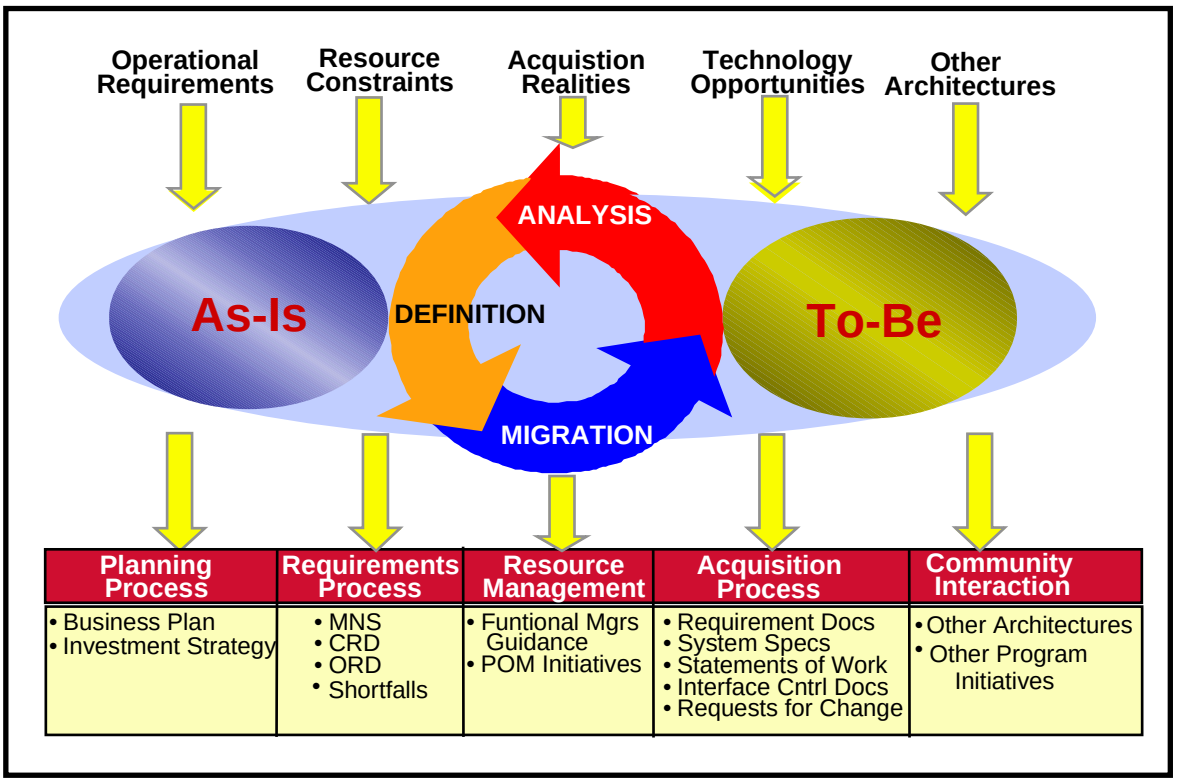


Figure 1-4 USIGS Architecture Evolution

1.2.3 Architecture Traceability and Linkages

Figure 1-5 provides a high-level overview of the relationships among documents which describe the USIGS Architecture, the documents which significantly influence the content of that Architecture, and the documents which depend on that Architecture. Subsequent sections of the UAF will describe these relationships in greater detail.

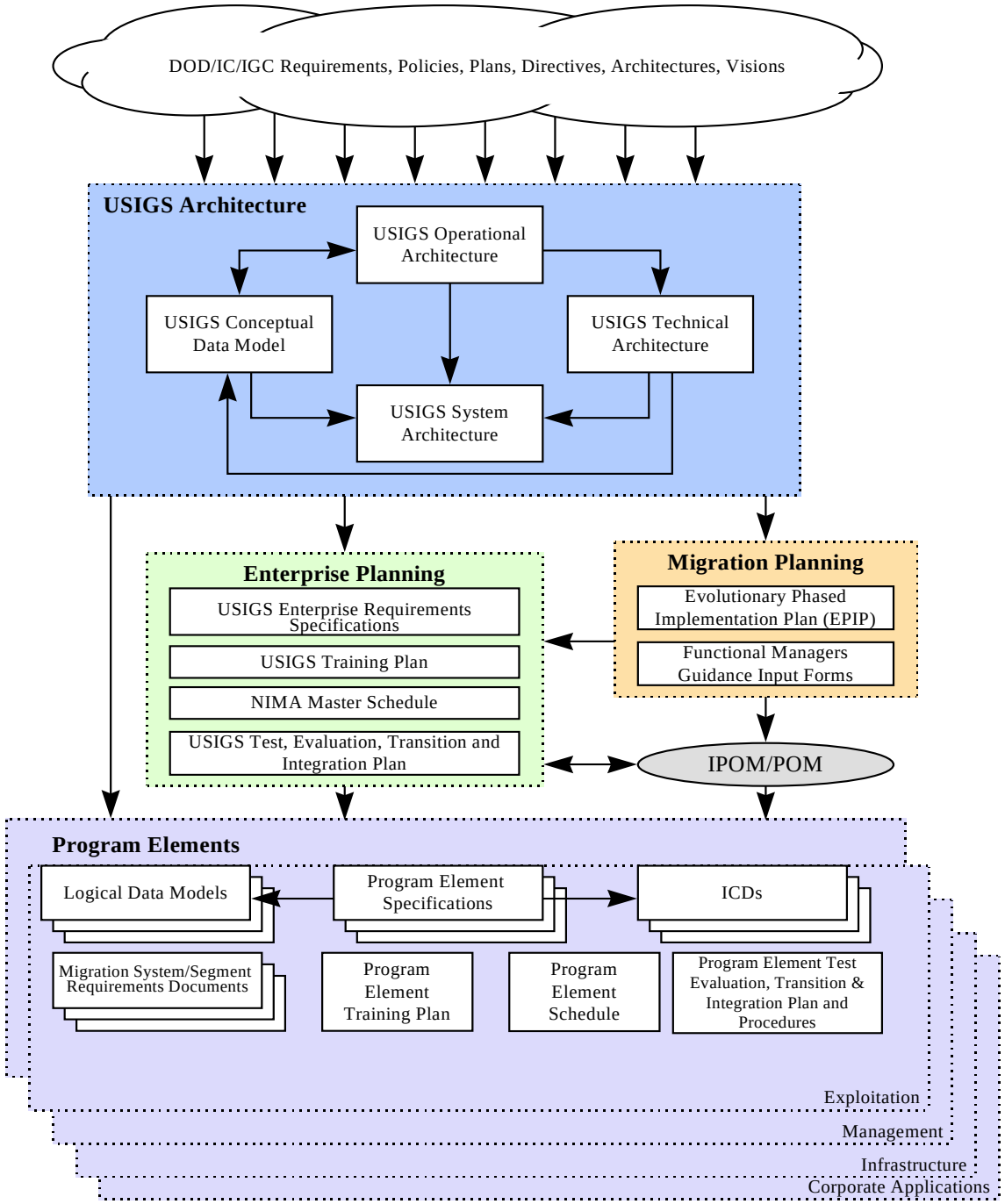


Figure 1-5 USIGS Architecture Traceability Linkages

1.2.4 Architecture References

In the course of developing essential and supporting USIGS Architecture products, one or more formal references or sources may be required to be used in order to ensure that specific architecture descriptions are complete and in conformance with current policy and formal direction. These key sources are referred to as Universal Reference Resources, as in *C4ISR Framework* usage.

Universal Reference Resources for the USIGS Architecture include the following:

- *C4ISR Architecture Framework*, Version 2.0, 18 December 1997
- Data Administration Procedures (DoD 8320.1-M), April 1998
- DoD *Technical Architecture Framework for Information Management* (TAFIM), Version 3.0, 30 April 1996
- Deputy Secretary of Defense/Director of Central Intelligence *Joint Intelligence Guidance* (annual)
- *DoD Dictionary of Military and Associated Terms* (DoDJP 1-02), as amended 3 November 1997
- *Functional Manager's Guidance for the USIGS Community FY 1999-2003*, 20 December 1996
- *DoD Joint Technical Architecture*, Version 2.0, 26 May 1998
- *Joint Vision 2010*, undated
- USIGS Technical Architecture (UTA), 6 November 1997
- USIGS Glossary, 6 November 1997
- USIGS Conceptual Data Model, 23 June 1998
- USIGS System Architecture Description, Volume I: To-Be Description, 28 July 1998
- USIGS System Architecture Description, Volume II: USIGS Interoperability Profile (UIP), 28 July 1998
- USIGS Operational Architecture Description (UOAD), 26 May 1998
- National Imagery and Mapping Agency (DoDD 5105.60), 11 October 1996
- National Imagery and Mapping Agency Business Plan 1997
- National Imagery and Mapping Agency Strategic Plan for 1998 and Beyond, 1997
- National Imagery and Mapping Agency *Operations Directorate Vision* , September 1997
- *Imagery and Geospatial Community Operation Vision into the 21st Century*, Draft, December 1997
- *Universal Joint Task List*, Version 3.0, 13 September 1996
- Defense Information Management (IM) Program (DoDD 8000.1) 8 October 1997

Other reference documents which may facilitate a reader's understanding of the material contained within this document include:

- Acquisition (NIMA Policy Directive 5000), 31 July 1997
- Acquisition, Program Development, Approval (NIMA Instruction 5000.1), 5 August 1997
- *Airborne Reconnaissance Annex* (ARA), JTA version 2.0, May 1998
- *DCGS Acquisition Handbook CIGSS Segment Standards*, Version 1.0, DRAFT, 31 July 1997
- *Concept for Future Joint Operations*, May 1997
- *Defense Information Infrastructure (DII) Common Operating Environment (COE)*, Version 3.2, 3 October 1997
- *Defense Information Infrastructure Master Plan*, Version 6.0, 27 June 1997
- *Geospatial Information Infrastructure (GII) Master Plan*, 17 October 1997
- NIMA/ST Program Implementation Document (PID), 26 August 1997
- Object Management Group's (OMG) Object Management Architecture Guide, Revision 3.0, June 1995
- Policy-Development Process (NIMA Directive 5025.1), 17 March 1997

1.3 USIGS Overview

1.3.1 Future USIGS Environment

A number of assumptions are important in describing the future environment in which USIGS will operate. Foremost among these are the impacts of continued USIGS resource constraints (personnel and fiscal), increased information requirements within shrinking timelines, and increasing pressure to release information at lower classification levels.

Another major assumption is that imagery collection capabilities will be substantially expanded in the future. Large-area collectors and multispectral imagery collectors will also be more readily available. Improved Unmanned Aerial Vehicles (UAVs) and Remotely Piloted Vehicles (RPVs) will be in regular operation. Older US national imagery will be declassified and commercially available. Finally, commercial imagery with improved quality will be available from a number of new US and foreign imagery collectors.

Demands on USIGS capabilities to provide more timely access to imagery, imagery intelligence , and geospatial information will continue to increase. Achieving and maintaining Dominant Battlefield Awareness – an interactive picture using all-source fused information – will mandate more timely information support to a shorter military operations cycle, and the flexibility to provide a wide variety of information rapidly in support of US and allied military operations world-wide. Increased availability of smart weapons, sophisticated mission planning systems, and mission simulators/rehearsal systems will significantly increase the need for access to imagery and geospatial information. Similarly, US Government (USG) decision-makers, policy-makers, and planners, at all levels, will demand more timely imagery intelligence, and improved access to imagery and geospatial information in order to better respond to fast-changing world events. Requirements for imagery, imagery intelligence, and geospatial information will also continue to expand in traditional USG areas of interest such as treaty monitoring, weapons proliferation, counter-terrorism, counter-drug, economic analysis, and environmental studies.

The cost of implementing technology will continue to decrease markedly over time, making the use of imagery more affordable to all USIGS customers. The implementation of multi-level security capabilities will gradually reduce the need for maintaining redundant parallel systems across multiple security levels, making a wider variety of information accessible to USIGS customers. The volume of available imagery intelligence information will have increased due to the introduction of and new automated imagery exploitation tools, and reliable voice input capabilities at major production facilities within the DoD and US Intelligence Community. The increased availability of high-quality digital information across the USIGS will significantly increase the volume of locally -generated, and often tailored, imagery, maps, and hardcopy imagery intelligence products. There will also be a increase in the local production of digital media to support distribution to nearby stand-alone and non-time dominant information customers. A corresponding decrease in the volume of production of hardcopy and media at national and regional production facilities can be anticipated for some types of products. However, cost considerations, along with the decreased classification levels of imagery and geospatial information will result in a significantly larger number of customers with stand-alone systems and non-time dominant information requirements. Depending upon the increase in the customer base supported by individual national and regional production centers, this may result in

expanded bulk production of non-time dominant, low cost, hardcopy and physical media. Hopefully, the costs associated with the current reliance on dedicated couriers to disseminate these products, will be mitigated by the increased use commercial courier services to disseminate these products.

1.3.2 USIGS Common View of Mission Space

The USIGS seeks to guarantee access to three base layers of Figure 1-6, (i.e., geospatial foundation, imagery, and imagery intelligence). The geospatial, imagery, and intelligence pieces of the common view of mission space must be in place, reliable, and current – providing immediate local access to a customer-tailored information mix of high quality digital data, digital and digitized-hardcopy products.

The geospatial foundation layer is an integrated data set of positional information which is used to satisfy basic customer location, elevation, and feature information requirements. Feature data includes information on naturally-occurring and significant man-made objects such as rivers, mountains, cities, roads, and power lines. (Feature data is organized in thematic sub-layers, elevation data, and controlled image base.) The geospatial foundation layer is validated by NIMA for accuracy and, like maps, is available in variety of scales and relative accuracies in order to meet the wide range of customer mission requirements. The term "foundation" is used in reference to the geospatial layer since all other layers are registered to it.

The imagery layer is composed of original and/or manipulated imagery not incorporated into the controlled image base. This layer provides additional detail, visual or non-literal (as in the case of imagery collected by a radar sensor), which is often needed for planning, recognition, analysis, and confidence-building/decision-making.

The imagery intelligence layer captures the analytical data resulting from imagery exploitation. This data is to satisfy customer information requirements in areas such as indications and warning, hostile threats, force composition and deployment, facility/equipment identification and location, mission planning, targeting, and damage assessment. It may be used separately, or as an important input to all-source fused information in support of Dominant Battlefield Awareness.

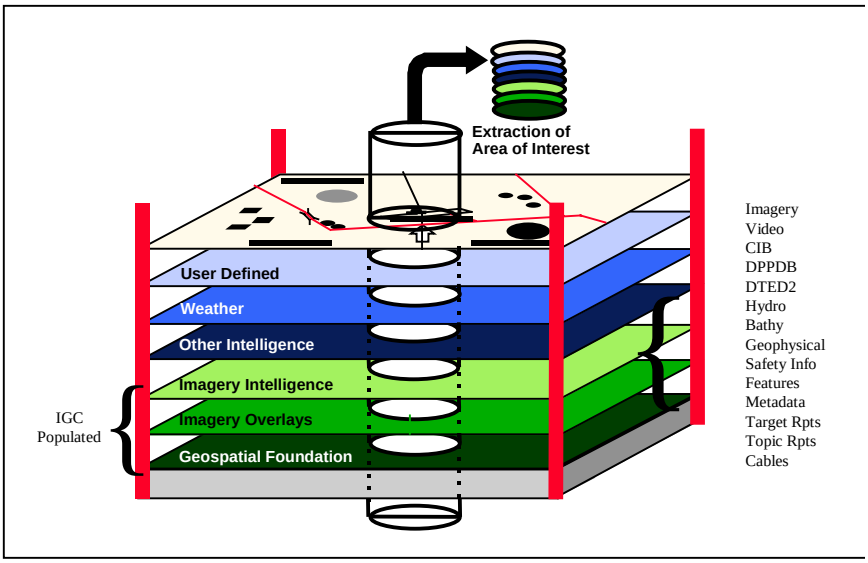


Figure 1-6 USIGS Common View of Mission Space

1.3.3 Customers' View

The role of imagery, geospatial information, and their analytic derivatives – imagery intelligence and terrain analyses – are critical to accomplishing the missions of IGC customers. Customers require access to digital imagery, imagery intelligence, and geospatial information which can be integrated locally, using fast, affordable and interoperable tools, in order to perform their planning, operations, and mission assessment tasks. For military customers, this capability is fundamental to achieving Dominant Battlespace Awareness.

Satisfying customer requirements is the central goal of the USIGS Information Cycle. (See Figure 1-7).

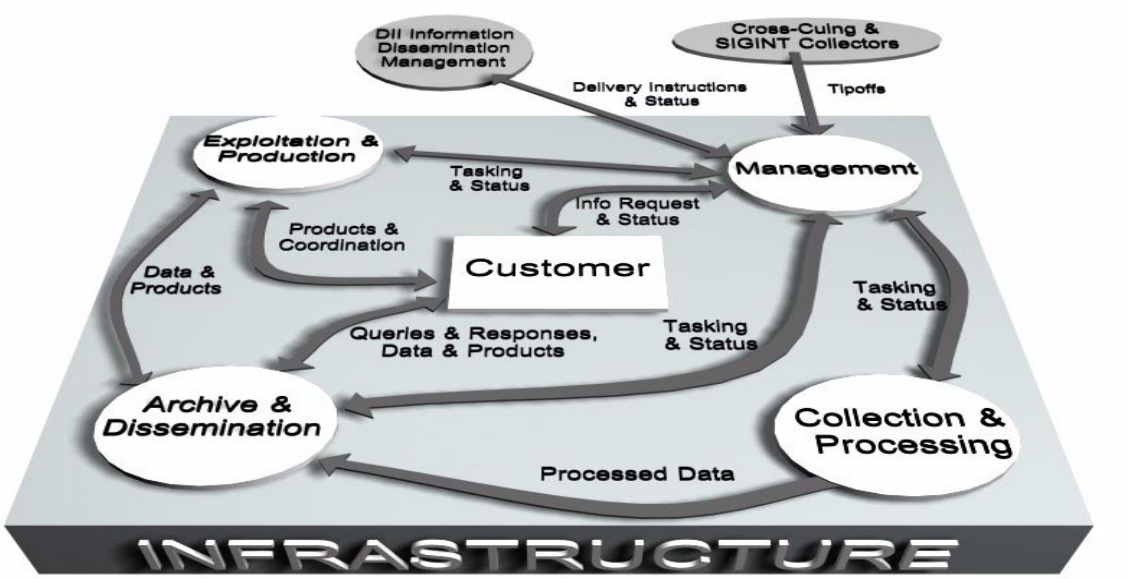


Figure 1-7 USIGS Information Cycle

The USIGS will provide automated capabilities, common applications, and access to digital imagery, imagery intelligence, and geospatial information for authorized customers at all organizational levels. USIGS applications will include management, dissemination, and exploitation tools. They will be user-friendly, supported by contextual help function; and, where possible, self-taught using on-line training. Servers and libraries which contain USIGS information will be configured so that they appear to the customer to be a single, virtual library. USIGS libraries will be accessible through a variety of communication paths to ensure the most responsive use for all customers based upon the priority of their requirement, and their individual infrastructure and communications support capabilities. The acquisition of imagery, imagery intelligence, and geospatial information from the USIGS libraries will be fully integrated with the acquisition of other operational and intelligence source data. USIGS customers will establish standing delivery profiles which govern their receipt of new and historical imagery, imagery intelligence products and information, and maps and geospatial information. Individual profiles may be pre-established in anticipation of existing tasks, or ad hoc in order to meet new requirements. They will be validated by responsible authorities, in accordance with established policy and security guidance. Delivery emphasis for all customers will be on electronic

dissemination to satisfy customer timeliness requirements. USIGS customers will provide the requisite communications and local infrastructure capabilities needed to access the USIGS, and provide for local storage and hardcopy/media production.

Potential non-US Government IGC customers include: US commercial and academic interests; and allied government, commercial, and academic interests. The USIGS will support individual customers in these categories in accordance with USG policy and security directives, on a prioritized basis. In order to obtain USIGS access, these customers will be required to provide their own USIGS-compliant capabilities including infrastructure, communications, processing, storage, and production. Customers in these categories will also have the option to receive hardcopy products and media generated at other USIGS production sites.

1.3.4 NIMA's Response

NIMA's vision is to guarantee the information edge – ready access to the world's imagery, imagery intelligence and geospatial information. In order to achieve this vision, NIMA has established four Strategic Goals:

- Provide customers with seamless access to tailorable imagery, imagery intelligence, and geospatial information – not just structured products.
- Make imagery, imagery intelligence , and geospatial information available on very short timelines at the lowest possible classification.
- Obtain and use the best available information, whether commercial, government, or other source.
- Use private sector services and best available commercial technology to improve service to customers.

NIMA has developed a three-phased investment strategy for achieving these goals. The first phase (present - 2000) lays the foundation by focusing on information production. The second phase (2000 - 2003) improves the performance of access and delivery of information. The third-phase (2003 - beyond) concentrates on integration of information and services with customers. This phased approach ensures the production of greater quantities of information in a more efficient manner and the robust access and delivery capabilities are in place as the USIGS deploys across the IGC.

The NIMA Information Service (NIS) is an important construct to the growth of the USIGS (see Figure 1-8). The NIS is the gateway to imagery, imagery intelligence, and geospatial information acquired and produced by NIMA for its customers. It provides customer service data and software applications related to this information. The NIS provides on-line, integrated access to, and delivery of NIMA information content as formatted products and seamless coverages, stored in an array of distributed libraries. Customers may browse through structured directories of products or search metadata catalogs that characterize the products by a number of parameters. Once located, files may be viewed by a customer, or downloaded ("pulled") to their workstation or work-group server for local tailoring and use.

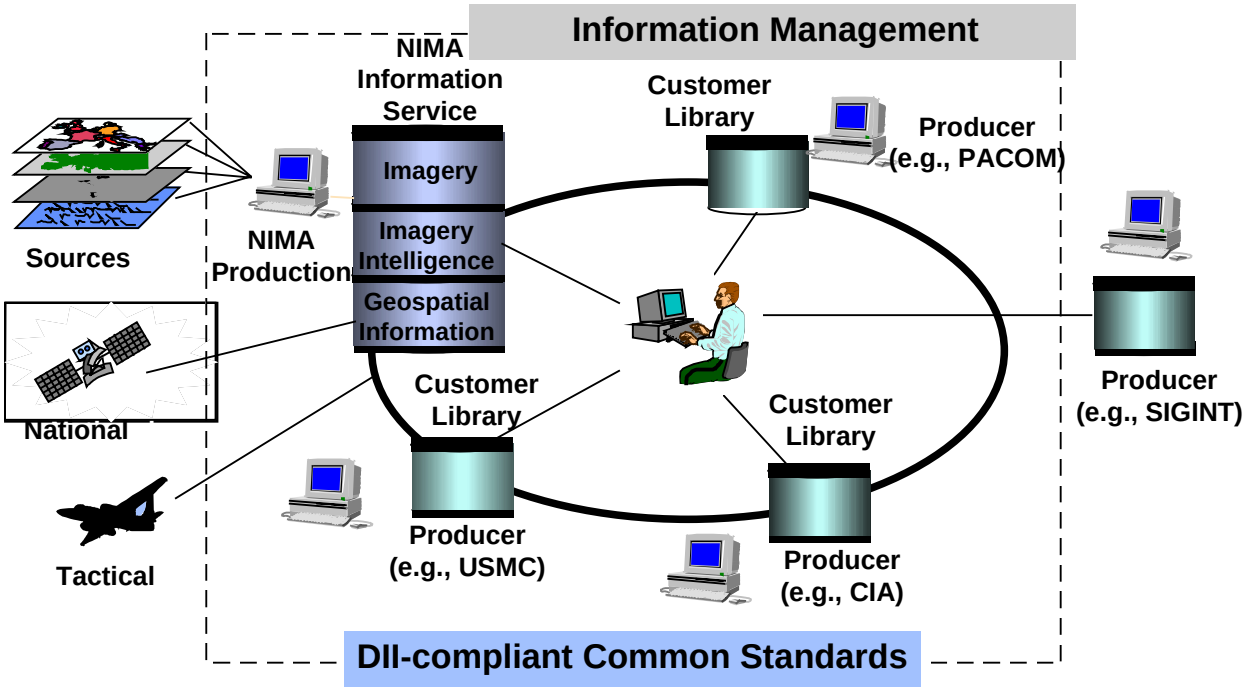


Figure 1-8 NIMA Information Service Model

The "USIGS Information Service" represents an extension of the NIS and will be achieved when IGC customers have reliable and timely access to a single "virtual" library with all available imagery, imagery intelligence, and geospatial information resources in the network of geographically distributed, physically separated USIGS libraries and servers.

1.4 USIGS Glossary

The USIGS Glossary is a collection of terminology supporting the USIGS Architecture. It defines terms and acronyms and, similar to a dictionary, cites multiple sources and definitions when appropriate. The USIGS Glossary facilitates the common understanding of NIMA unique and general terminology necessary to architecture definition. The Glossary contains:

- Imagery and Geospatial Terms, Systems, Products
- Information Technology and Architecture Terms
- Terms of General Interest or for Informational Purposes

Term	Definition/Description	Source
data compression	See Compression.	Multimedia
data definition	A description of the format, structure, and properties of a data item, data element, or data structure.	IEEE 610.5
Data Definition Language (DDL)	(1) A language for describing the organization of data within a database. *Note*: In some software, the logical organization is described; in some, both the logical and physical organizations are described. (2) A language used to describe the logical structure of a database. *Syn*: data description language, database descriptive language; schema definition language; schema language.	IEEE 6105
data dictionary	A collection of entries specifying the name, source, usage, and format of each data element used in a system or set of systems.	IEEE.610.5
data dictionary	Repository of information about the definition, structure, and usage of data. It does not contain the actual data.	HDBK-850
data dictionary	A specialized type of database containing metadata that is managed by a data dictionary system; a repository of information describing the characteristics of data used to design, monitor, document, protect, and control data in information systems and databases; an application of data a dictionary system. (DoDD 8320.1-M-1, "Data Element Standardization Procedures," January 15, 1993, authorized by DoD Directive 8320.1, September 26, 1991)	JTA
data element	A basic unit of information having a meaning and that may have subcategories (data items) of distinct units and values. [DODD 8320.1]	DISA CFS

Figure 1-9 USIGS Glossary Extract (sample)

Table 1-1 USIGS Glossary

Name: USIGS Glossary
Description and Purpose of Product: The purpose of the USIGS Glossary is to provide a single point of reference that defines those special terms dealing with the USIGS Architecture and architecture-related issues, USIGS relevant Information Technology terms, and DOD/IC organization and IT systems names. The USIGS Glossary may include multiple definitions for a term, where appropriate, and also includes the authority, or source, for each term's definition.
Audience: USIGS senior and mid-level managers, resource managers, program executive officers, program managers, system architects, system developers, system engineers, system operators; NIMA DO, ST, CA
Creator/Maintainer: NIMA ST/ARU
Format: Multiple pages of text
Applicable Tools: Word Processor; Database Management System
Dependent On: Numerous sources as outlined in the Glossary document
nfluenced: Planning Process - Mandatory Requirements Process - Mandatory Resource Management - Mandatory Acquisition Process - Mandatory Community Interaction - Dependent
Revision Cycle: Annual
Controlling Authority: NCCB
Classification: UNCLASSIFIED

Section 2

USIGS OPERATIONAL ARCHITECTURE

2.1 Description

The USIGS Operational Architecture describes the tasks, operational elements, and information flows required to accomplish or support customer organizations' planning and operations. USIGS Operational Architecture products describes the context (mission), activities, operational relationships, and information flows within USIGS and to and from its customers and suppliers. It reflects NIMA's mission to support DoD's wartime missions, national policy-making, and civil organization operations and research. The Operational Architecture supports IGC mission requirements as articulated in directives, policy, doctrine, procedures, and organizational concepts of operation. Information Exchange Requirements (IERs) identified in the Operational Architecture provide the basis for technical requirements, standards, conventions, and new technological capabilities, which provide a foundation for defining systems capabilities and requirements.

2.2 Major Influences

- *Joint Vision 2010*
- *C4ISR Architecture Framework*
- *Airborne Reconnaissance Architecture*
- NIMA Business Plan
- NIMA Strategic Plan for 1998 and Beyond
- NIMA *Operations Directorate Vision*
- *Imagery and Geospatial Community Operations Vision Into the 21st Century* (IGC Operations Vision)
- National Imagery and Mapping Agency (DoDD 5105.60)

2.3 USIGS Operational Architecture Products

USIGS Operational Architecture products describes the basic conditions under which the overall architecture applies. These conditions include the missions, operational concepts, and functions the architecture must support, the organizational relationships and major operational elements to which the missions and functions are assigned, the functions and the activities derived from the mission and operations concept, and the information types and resulting information flows and functional topology. USIGS Operational Architecture documentation has been compiled into a single document, the *USIGS Operational Architecture Description* (UOAD). Each product represents a separate appendix or addendum to the primary document.

Operational Architecture products includes:

- USIGS Operational Concept Diagram
- USIGS Operational Relationship Chart
- USIGS Activity Hierarchy
- USIGS Activity Diagram
- USIGS Information Exchange Requirements Matrix
- USIGS Operational Scenario

2.3.1 USIGS Operational Concept Diagram

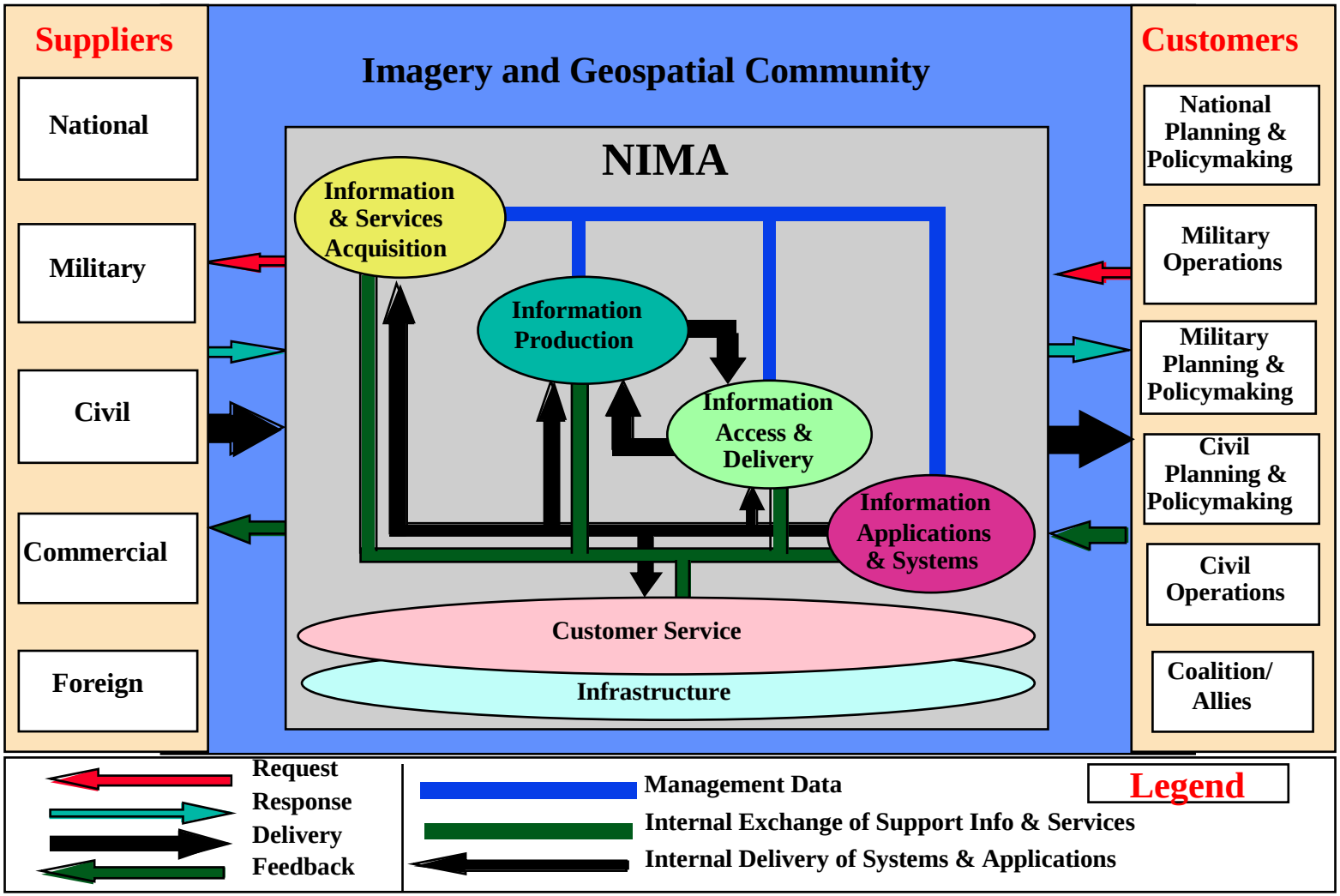


Figure 2-1 USIGS Operational Concept Diagram (sample)

Table 2-1 USIGS Operational Concept Diagram

Name: USIGS Operational Concept Diagram
Description and Purpose of Product: The USIGS Operational Concept Diagram is used to depict the "big picture" view of the operational environment. It features a high-level description of the operational concept, and a graphic portrayal oriented to senior-level management. The figure shows the production within the USIGS environment; the production organization is portrayed in terms of its major, mission-related functions. The relationship between USIGS and its customer and supplier/co-producer communities is depicted in generic terms. The lines connecting the activity boxes within the production organization represent internal information movement. The central theme of this diagram is the flow of information, both internal (within the production organization) and external (between the production organization and its customers and suppliers).
Audience: USIGS senior and mid-level managers, program managers, system architects, system developers; NIMA DO, ST, CA
Creator/Maintainer: NIMA DO, CA/CF
Format: Multiple page annotated graphics with supporting text
Applicable Tools: Future versions of the Joint C4ISR Architecture Planning/Analysis System (JCAPS) plan to have the capability to generate some, or all, of this product from data provided in the other USIGS products.
Dependent On: National Imagery and Mapping Agency (DoDD 5105.60); NIMA Business Plan; NIMA *Operations Directorate Vision, IGC Operations Vision*. May include inputs from the NIMA FY97 Work Plan. May also be influenced by the USIGS Operational Relationship Chart, the USIGS Activity Hierarchy, USIGS Activity Diagram, USIGS Information Exchange Requirements Matrix.
Processes Influenced: Planning Process - Mandatory (i.e., Must be considered in this process to ensure USIGS Architecture compliance) Requirements Process - Mandatory Resource Management - Guidance (i.e., Should be considered in this process to ensure USIGS Architecture compliance) Acquisition Process - Guidance Community Interaction - Dependent
Revision Cycle: Annual
Controlling Authority: NIMA Configuration Control Board (NCCB)
Classification: UNCLASSIFIED

2.3.2 USIGS Operational Relationship Chart

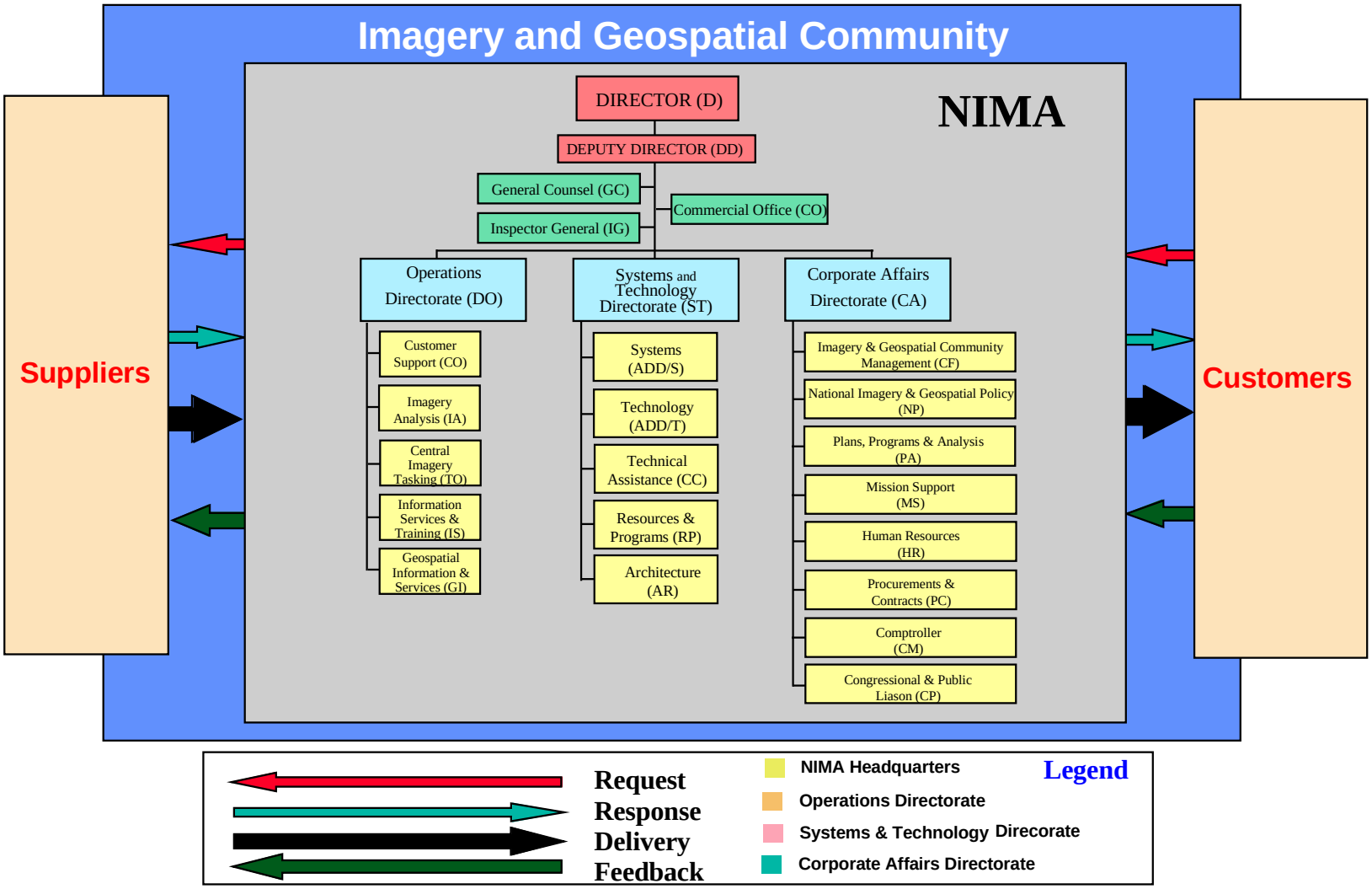


Figure 2-2 USIGS Operational Relationship Chart (sample)

Table 2-2 USIGS Operational Relationship Chart

Name: USIGS Operational Relationship Chart
Description and Purpose of Product: The USIGS Operational Relationship Chart identifies operational elements and their relationships. The chart depicts lines of command and coordination among operational elements. The basic purpose of this chart is to illustrate "how business is done." (This sample of the chart focuses on the operational elements within NIMA, and addresses elements external to NIMA in generic terms.)
Audience: USIGS senior and mid-level managers, program managers, system architects, and system developers; NIMA DO, CA, ST
Creator/Maintainer: NIMA DO, CA/CF
Format: Multiple page annotated graphics with supporting text
Applicable Tools: Future versions of the Joint C4ISR Architecture Planning/Analysis System (JCAPS) plan to have the capability to generate some, or all, of this product from data provided in the other USIGS products.
Dependent On: National Imagery and Mapping Agency (DoDD 5105.60); NIMA Business Plan; NIMA *Operations Directorate Vision, IGC Operations Vision*. May include inputs from the NIMA FY97 Work Plan. May also be influenced by the USIGS Operational Concept Diagram, the USIGS Activity Hierarchy, USIGS Activity Diagram, USIGS Information Exchange Requirements Matrix.
Processes Influenced: Planning Process - Mandatory Requirements Process - Mandatory Resource Management - Guidance Acquisition Process - Guidance Community Interaction - Dependent
Revision Cycle: Annual
Controlling Authority: NCCB
Classification: UNCLASSIFIED

2.3.3 USIGS Activity Hierarchy

The activity hierarchy is used to describe activities associated with specific tasks, the relationship among activities, and the decomposition of tasks.

A0 Manage the United States Imagery and Geospatial System
A1 Provide USIGS Leadership support
A11 Provide USIGS Policy Direction
A111 Develop USIGS Policies and Procedures
A112 Establish USIGS Priorities and Strategies
A1121 Develop the USIGS Strategic Plan/Vision
A1122 Publish/Brief the USIGS Strategic Plan/Vision
A113 Develop and Maintain USIGS Technology, Data, and Product Specifications and Standards
A114 Develop and Maintain International Agreements
A115 Develop and Maintain Legal Agreements
A12 Provide USIGS Guidance and Advocacy
A121 Define USIGS Architecture
A1211 Develop and Maintain Architecture Framework
A1212 Develop and Maintain Operational Architecture
A12121 Develop and Maintain Operational Architecture Products
A12122 Produce USIGS Shortfall Analysis Report
A1213 Develop and Maintain Technical Architecture
A1214 Develop and Maintain System Architecture
A1215 Develop and Maintain Conceptual Data Model
A1216 Develop and Maintain Migration Plan
A12161 Develop and Maintain Migration Products
A12162 Brief/Publish USIGS Migration Plan to IGC
A122 Provide Program and Budget Guidance
A1221 Review IGC POM Submissions
A1222 Provide Functional Manager's Decision Support (Publish FMGC)
A1223 Issue Guidance as Appropriate
A123 Provide Guidance to Collection, Processing, Analysis and Dissemination Resources
A1231 Establish Projections of Future USIGS Imagery and Geospatial Needs
A1232 Develop and Disseminate Policies and Procedures to Guide USIGS Collection, Processing, Analysis, and Dissemination Assets

Figure 2-3 USIGS Activity Hierarchy Excerpt (sample)

Table 2-3 USIGS Activity Hierarchy

Name: USIGS Activity Hierarchy
Description and Purpose of Product: The purpose of the activity hierarchy is to describe activities associated with specific tasks, the relationship among activities, and the decomposition of tasks. For a given architecture perspective, the activity hierarchy starts by using one of the tasks at the top of the hierarchy. This top-level task is then broken down into lower level tasks until the tasks at the lowest level can be clearly identified with a particular operational element or node responsible for accomplishing the task. The activity hierarchy should be refined only to the level necessary to meet the needs of the architecture being developed. Some levels of the hierarchy may be refined to a lower level of detail so as to address some specific objectives of the architecture being developed.
Audience: USIGS program managers, mid-level managers, system architects, system developers; NIMA DO, CA, ST
Creator/Maintainer: NIMA DO, CA/CF
Format: Multiple pages of text in outline format
Applicable Tools: The requirements management process (as implemented in DOORS) will use the Activity Hierarchy to determine if an incoming need is within the scope of the USIGS. In addition, DOORS will show traceability from each activity up to the driving documentation that requires that activity and down to the systems architecture and the ongoing acquisition efforts to support that activity. Future versions of the Joint C4ISR Architecture Planning/Analysis System (JCAPS) plan to have the capability to ingest and/or generate some, or all, of this product from data provided in the other USIGS products.
Dependent On: National Imagery and Mapping Agency (DoDD 5105.60), NIMA Business Plan, NIMA *Operations Directorate Vision*, *IGC Operations Vision*, USIGS Operational Concept Diagram
fluenced: Planning Process - Mandatory Requirements Process - Mandatory Resource Management - Guidance Acquisition Process - Guidance Community Interaction - Dependent
Revision Cycle: Annually, or as directed in response to organization and/or mission changes
Controlling Authority: NCCB
Classification: UNCLASSIFIED

2.3.4 USIGS Activity Diagram

The purpose of the USIGS Activity Diagram is to describe the functional activities required to provide imagery, imagery intelligence, and geospatial information in support of USIGS customers. This analysis will use Unified Modeling Language (UML) Use-Case methodology. Use-Case notation will: depict interactions by which external "actors" engage the services of the USIGS; provide a means to identify and document classes of users and the external systems that interact with the USIGS; provide a means to specify required transaction-based USIGS services; and facilitate the allocation of services/capability requirements to USIGS software architecture components.

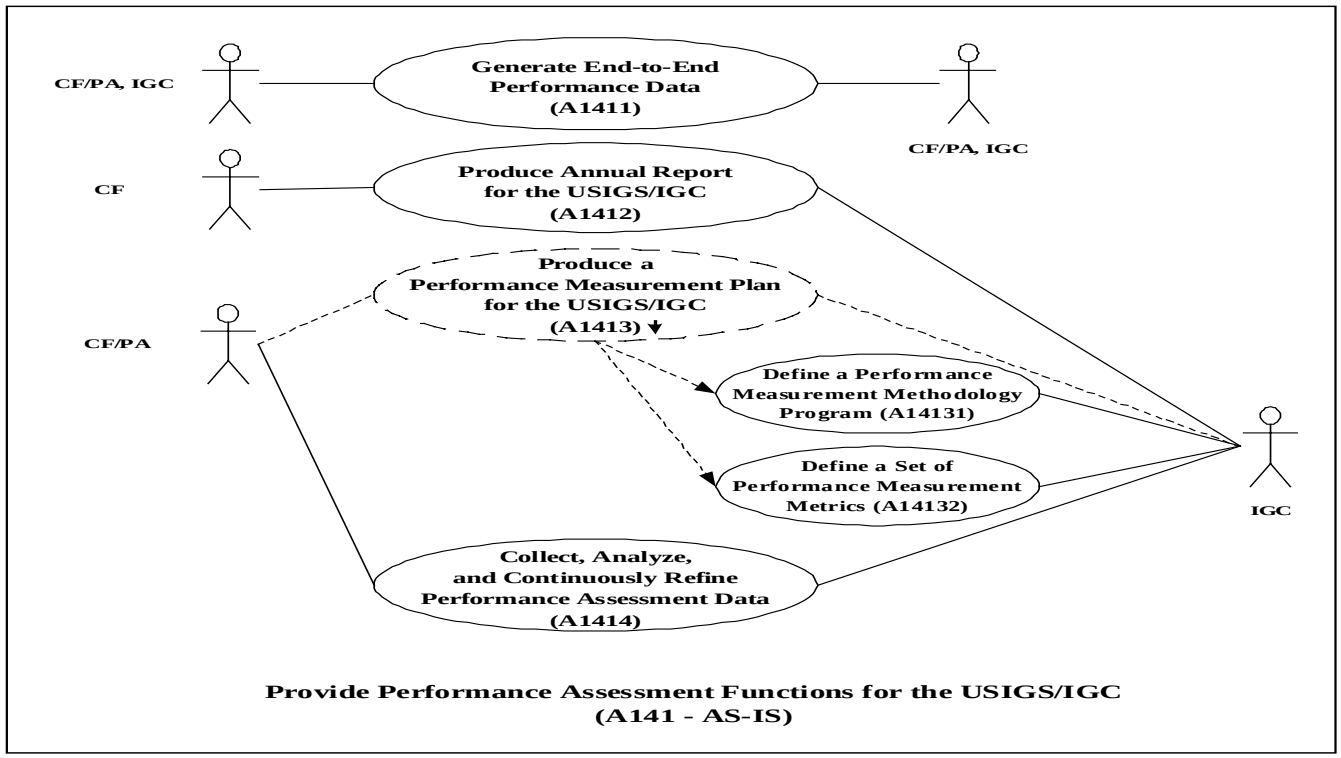


Figure 2-4 USIGS Activity Diagram Excerpt (sample)

Table 2-4 USIGS Activity Diagram

Name: USIGS Activity Diagram
Description and Purpose of Product: The purpose of the USIGS Activity Diagram is to describe the functional activities required to provide imagery, imagery intelligence, and geospatial information in support of USIGS customers. This analysis utilizes the Unified Modeling Language (UML) Use-Case methodology for modeling. Use-Case notation will: depict interactions by which external "actors" engage the services of the USIGS; provide a means to identify and document classes of users and the external systems that interact with the USIGS; provide a means to specify required transaction-based USIGS services; and facilitate the allocation of services/capability requirements to USIGS software architecture components.
Audience: USIGS program managers, mid-level managers, system architects, data modelers, system developers; NIMA ST
Creator/Maintainer: NIMA DO, CA/CF
Format: Multiple annotated graphics
Applicable Tools: Future versions of the Joint C4ISR Architecture Planning/Analysis System (JCAPS) plan to have the capability to ingest and/or generate some, or all, of this product from data provided in the other USIGS products.
Dependent On: USIGS Operational Relationship Chart, USIGS Activity Hierarchy
Processes Influenced: Planning Process - Mandatory Requirements Process - Mandatory Resource Management - Guidance Acquisition Process - Guidance Community Interaction - Dependent
Revision Cycle: Annual, or as required by modifications to the USIGS Activity Hierarchy
Controlling Authority: NCCB
Classification: UNCLASSIFIED

2.3.5 USIGS Information Exchange Requirements Matrix

Based on the activity hierarchy and activity diagrams, the Operational Architecture will define USIGS Information Exchange Requirements (IERs). An IER Matrix consists of a defined activity, a sender, a recipient, a specific information element, type of media, and appropriate classification and handling instructions. Performance information such as a measure of volume (transactions per time), the minimum time required to accomplish a specific activity/transaction, and a quality measure may also be included in the IER Matrix.

Activity Name	Information Element	Sender	Recipient	Media	Classification	Caveat	Volume	Minimum Time to Accomplish	Quality Measure
1.0 Information and Services Acquisition									
1.1 Monitor, Assess, and Report USIGS Status	Operational Support Data/References	Collectors, processors, analysis and production centers, libraries, dissemination centers	Executive manager						
- 1.1.1 Provide system-level assessments									
- 1.1.1.1 Perform imagery systems assessment	Status/Feedback Messages	National collectors	Executive manager	Electronic, Voice	TOP SECRET	LIMDIS	X per time	X minutes	Accepted/ Rejected
	Status/Feedback Messages	Theater collectors	Executive manager	Electronic	SECRET	None	X per time	XX minutes	Accepted/ Rejected
	Status/Feedback Messages	Tactical collectors	Executive manager	Electronic	SECRET	Nome	X per time	XX minutes	Accepted/ Rejected
	Status/Feedback Messages	Commercial collectors	Executive manager	Electronic	UNCLASSIFIED	None	X per time	XX minutes	Accepted/ Rejected
	Status/Feedback Messages	Civil collectors	Executive manager	Electronic	UNCLASSIFIED	None	X per time	XXX minutes	Accepted/ Rejected
	Status/Feedback Messages	Foreign collectors	Executive manager	Electronic, Voice	UNCLASSIFIED	Rel CAN, UK, AUS	X per time	XX minutes	Accepted/ Rejected
	Status/Feedback Messages	National processors	Executive manager	Electronic	TOP SECRET	LIMDIS	X per time	X minutes	Accepted/ Rejected
	Status/Feedback Messages	Theater processors	Executive manager	Electronic	SECRET	None	X per time	XX minutes	Accepted/ Rejected
	Status/Feedback Messages	Tactical processors	Executive manager	Electronic	SECRET	None	X per time	XX minutes	Accepted/ Rejected
	Status/Feedback Messages	Commercial processors	Executive manager	Electronic, media	UNCLASSIFIED	None	X per time	XXX minutes	Accepted/ Rejected

Figure 2-5 USIGS Information Exchange Requirements Matrix Excerpt (sample)

Table 2-5 USIGS Information Exchange Requirements Matrix

Name: USIGS Information Exchange Requirements Matrix
Description and Purpose of Product: The USIGS Information Exchange Requirements Matrix is based on the USIGS Activity Hierarchy and USIGS Activity Diagrams. IER line entries consists of a defined activity, a sender, a recipient, a specific information element, type of media, and appropriate classification and handling instructions. Performance information such as a measure of volume (transactions per time), the minimum time required to accomplish a specific activity/transaction, and a quality measure may also be identified.
Audience: USIGS program managers, mid-level managers, system architects, data modelers, system developers; NIMA ST
Creator/Maintainer: NIMA DO, CA/CF
Format: Multiple page table with text
Applicable Tools: Future versions of the Joint C4ISR Architecture Planning/Analysis System (JCAPS) plan to have the capability to ingest and/or generate some, or all, of this product from data provided in the other USIGS products.
Dependent On: USIGS Activity Hierarchy, USIGS Activity Diagrams
Processes Influenced: Planning Process - Mandatory Requirements Process - Mandatory Resource Management - Guidance Acquisition Process - Guidance Community Interaction - Dependent
Revision Cycle: Annual, or as required by modifications to USIGS Activity Diagrams
Controlling Authority: NCCB
Classification: UNCLASSIFIED

2.3.6 USIGS Operational Scenario

How the USIGS Works

The Story below shows how the several USIGS initiatives come together to allow the responsive, accurate imagery and geospatial information support which users will require in 2003. As the information cycle proceeds -- from the establishment of a requirement to a user's having the answer to his question, the initiatives work together, and without the capabilities embodied in each, the others will not function as designed or required.

The Situation

A joint task force has been formed in early July, 2003, as the US component of a multinational operation to quell a rebellion in a third-world nation. US citizens and citizens of the other nations participating in the operation are being held hostage in several areas of the capital city. The multinational force has been given the mission of rescuing the hostages and restoring the elected government to power. The commander of the US joint task force has entered the area of operations with a robust C4I structure, including **a deployable NIMA Imagery Library as part of the NIMA Library Initiative**, populated with baseline imagery and geospatial information on the area of operations. US amphibious forces, supported by US and coalition special operations forces and tactical air assets, are scheduled to make an opposed landing as part of the rescue force tomorrow at first light. Intelligence Preparation of the Battle Space is virtually complete. The theater commander's intelligence plan for federated intelligence support was activated in the planning phases of the operation. The NMJIC has organized the JICs and JACs of supporting commands, and NIMA, DIA in a **federated intelligence support** structure. NIMA has provided the **necessary policy framework to permit essential sharing of imagery-derived information** with coalition partners.

A Critical Operational Question Is Asked

On the eve of the rescue operation, the US joint task force commander received a tip-off from SIGINT that a group of US hostages would be moved from the US embassy to a newly constructed office building two miles away. The JTF commander needs the latest imagery of the building to which the hostages are being moved, including floor plans and the areas in which his troops would be most vulnerable to insurgent attack during the rescue operation. His is also concerned about potential insurgent opposition to the rescue operation, and has levied a requirement for information on military movements and changes in the defenses in the vicinity of the building and its approaches. The deployable NIMA library on his flagship has complete imagery and digital geospatial information on the area of the capital city in which the building sits, but it has no imagery of the building after completion, nor is there historical coverage which would give the building's interior layout. His J2 passes the information requirement to the theater JIC, with a request that the information be provided before 0400 local time, to allow the landing force time to factor it into their planning. Upon receipt of the JTF commander's requirement, the JIC determines that some new collection will be required to satisfy the requirement, and that the imagery part of the answer can be provided by a combination of UAV's and national systems. The collection manager at the JIC enters the national requirement in **RMS, including the requirements for exploitation and distribution.**

New Imagery Is Collected, Existing Information is Pulled Together

At the theater Joint Reconnaissance Center, the requirement for advisory tasking of theater UAVs against the building where the hostages will soon be is received. The JRC accepts the tasking and arranges for UAV coverage of the area two hours before first light. UAV video will be sent from the UAV to a **Common Imagery Ground Station** and then fed to the JIC for injection into the **Joint Broadcast System (JBS)** video channel. NIMA's Central Imagery Tasking Office receives the collection requirement for national imagery and determines that . . . At the JIC, imagery analysts, working with their all-source counterparts, have determined that . . . the building was obtained as "bonus" coverage a day earlier. Coverage is obtained by a national system as tasked. . . and the coverage is received at the JIC and supporting JICs . . . before 0100. Simultaneously, the imagery enters the **National Imagery Library**.

The Pieces of the Puzzle Are Put Together - Analysis and Production

By the time the national system coverage arrives at the theater JIC, analysts at **softcopy workstations** have already begun their work. The capabilities of the **Exploitation Support System** have allowed the analysts to begin work with baseline data already pre-staged at their workstations. The JIC's imagery analyst cadre has reaped the benefit of the **Imagery Analyst Initiative**, and the command not only has increased its IA numbers, but has also seen the experience level rise with the cross-fertilization of IA's with NIMA and the career development which the initiative allowed. . . The exploitation tools provided by the **Exploitation Tools Initiative** will also allow the IA's to do the in-depth analysis the commander requires. One IA has already begun to provide an Image Perspective Transformation (IPT) view of the building, using imagery and geospatial data provided as a result of the **GIIPT Initiative** to provide a ground-level view of the approaches to the building from the harbor area. When the exploitation and analysis tasks were apportioned as a **collaborative exploitation** effort, NIMA IA's were assigned the task of providing in-depth analysis of the building. Using imagery of the building in various stages of construction available in the National Imagery Library, NIMA's had the information available before 0200 (theater time) and injected on **GBS** through the **Joint Information Management Center (JIMC)** in the Pentagon. Throughout the analysis process, IA's and all-source analysts at the theater JIC, supporting JICs, NIMA, and DIA worked together, in many cases using whiteboard and video teleconferencing.

The Information Gets to the User - On Time

By 0300, all of the pieces of the puzzle had come together. The theater JIC had completed its portion of the analysis. The IPT was on the **Image Product Library (IPL)** server and had been sent to the theater information management center for injection on the GBS broadcast to the JTF commander afloat. NIMA's in-depth analysis of the building was also in the hands of both the JTF commander and the theater JIC. In the meantime, the UAV had arrived on station at 0245, well in advance of first light. At 0330, the JTF commander received a HUMINT report through his National Intelligence Support Team (NIST) that the insurgents were moving the US hostages to the new office building, just as SIGINT had predicted. As the landing force completed its preparations, man-portable IPLs provided under the **NIMA Library Initiative** were being loaded with the information just received on the building and its approaches. At 0430, the assault force helos lifted off the LPH on their way to the port area. At 0515, as dawn was breaking, the force entered the office building, overwhelmed the still groggy guards, and evacuated the hostages even as the main body of the multinational force began their assault on the capital.

Figure 2-6 USIGS Operational Scenario Excerpt (sample)

Table 2-6 USIGS Operational Scenario

Name: USIGS Operational Scenario
Description and Purpose of Product: Operational scenarios provide brief textual and graphic descriptions of specific operational needs, activities, and/or processes which are intended to illustrate how tasks are, or will be, performed in order to accomplish a given mission, or missions, within a particular architecture perspective. Operational scenario are often composed of one or more "threads" which are usually described in a temporal sequence to demonstrate, in a real-world sense, the validity of a given architecture.
Audience: USIGS senior and mid-level managers, program managers, system architects, data modelers, system developers; NIMA DO, ST, CA
Creator/Maintainer: NIMA CA/PAS, DO
Format: Multiple pages of text with graphic(s)
Applicable Tools: Word Processor
Dependencies: Joint Vision 2010, NIMA Business Plan, NIMA *Operations Directorate Vision*, *IGC Operations Vision*, USIGS Operational Concept Diagrams, USIGS Operational Relationship Charts
Processes Influenced: Planning Process - Guidance Requirements Process - Guidance Resource Management - Guidance Acquisition Process - Guidance Community Interaction - Dependent
Revision Cycle: Annual, or as required to illustrate a significant mission change or need
Controlling Authority: NCCB
Classification: SECRET, as required by classified scenario references

2.4 USIGS Operational Architecture Product Linkages

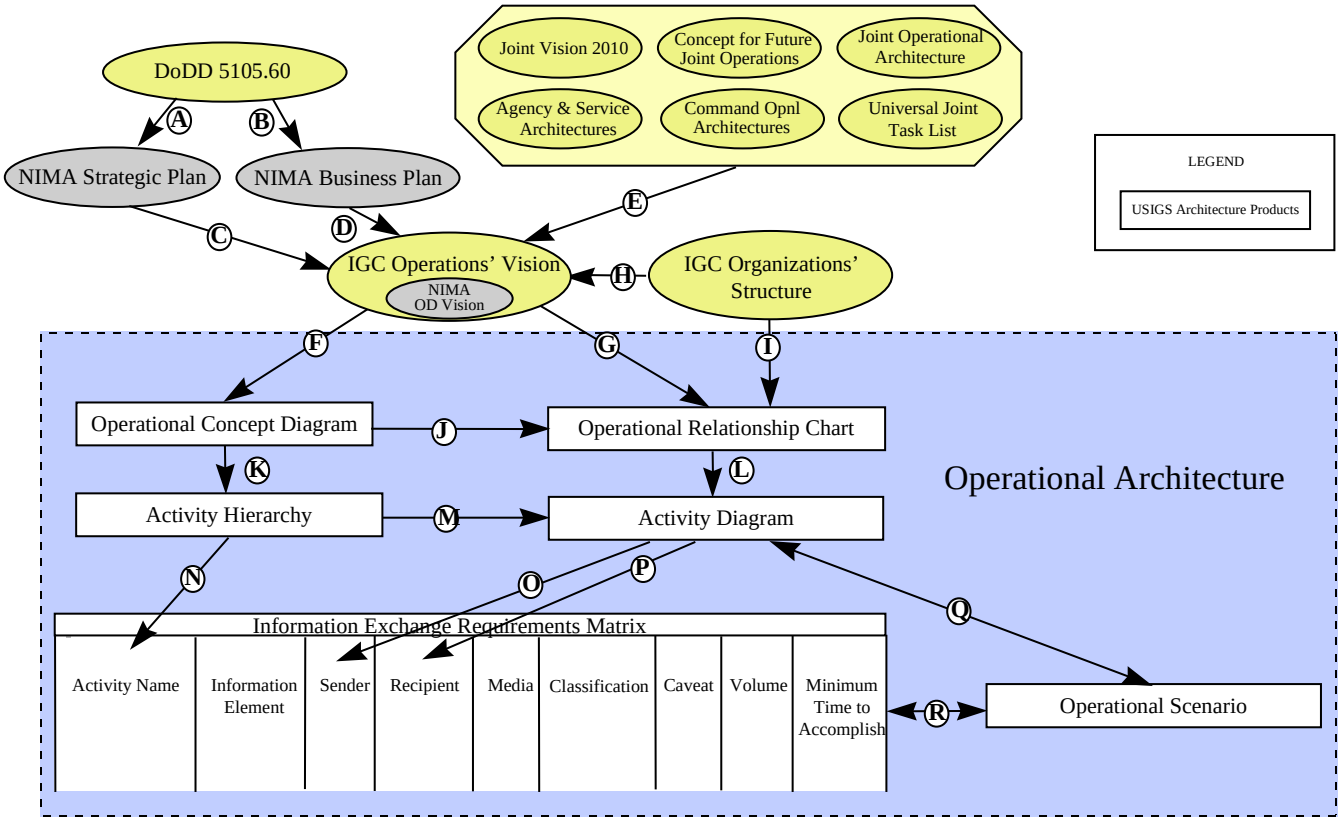


Figure 2-7 USIGS Operational Architecture Product Linkages

The linkages between the Operational Architecture and its source documentation are described as follows:

A: DoD Directive 5105.60 establishes NIMA. It also empowers NIMA's Director, as the Functional Manager for the US governments imagery, imagery intelligence, and geospatial activities.

B: DoD Directive 5105.60 establishes NIMA's responsibility to define how the agency intends to do business in the future to support its customers.

C: The NIMA Strategic Plan outlines NIMA's corporate roadmap to the future and will be the basis for its decision-making process. This plan supports movement from traditional imagery and geospatial hardcopy products to a more efficient and timely digital information service. These key concepts are included in the *IGC Operations Vision* and the NIMA *Operations Directorate Vision*.

D: NIMA's planned execution of its wide-ranging charter to produce imagery and geospatial information in support of national, defense, and civil community customers has a direct and significant impact on the how the IGC and USIGS will function in the future.

E: *Joint Vision 2010* establishes the initial conceptual template for channeling resources and leveraging technology to achieve new levels of effectiveness in joint warfighting. The *Concept for Future Joint Operations* expands the new operational concepts to provide a more detailed foundation for follow-on capabilities assessments. Various Joint Command, Service, Agency, and Command operational architectures identify more specific and specialized applications of these concepts. The *Universal Joint Task Lis*t contributes to the understanding of the tasks that can be performed by a joint military force. The operational concepts, mission tasks, and technology approaches contained in these documents must be encompassed by, and reflected in the *IGC Operations Vision*, if information superiority is to be achieved.

F: The *IGC Operations Vision* is a conceptual document which describes how the United States and foreign governments, together with their respective commercial and academic sectors, plan to establish a collaborative imagery and geospatial production environment to leverage strengths and share resources, and to exchange information in support of common interests and security objectives. This document serves to complement and align the internal visions of IGC organizations including NIMA's *Operations Directorate Vision*. These documents provide guidance for the development of the USIGS Operational Concept Diagram which is used to depict the "big picture" view of the operational environment.

G: The *IGC Operations Vision*, in concert with NIMA's *Operations Directorate Vision*, provide context for the USIGS Operational Relationship Chart which depicts lines of command and coordination among operational elements , and illustrate "how business is done."

H: IGC organizations are structured to support their individual missions. Organization structures impact the *IGC Operations Vision* by providing context for that vision and supporting functionalities.

I: IGC organization structures, both individually and collectively, must be documented and considered in describing how these organizations function and relate to each other, now and in the future.

J: The Operational Concept Diagram forms the basis for mapping functions to NIMA offices in the Operational Relationship Chart.

K: The Operational Concept Diagram provides the functions which constitute the top level entries in the Activity Hierarchy.

L: By depicting the information and service flows between organizational nodes, the Operational Relationship Chart provides the foundation for the development of the Activity Diagram.

M&N: The Activity Hierarchy drives the Information Exchange Requirements Matrix (IERM) and the Activity Diagram by providing the "Activities" which are depicted.

O&P: The Activity Diagram depicts the typical relationships between activities identified in the Activity Hierarchy, and thereby, provides the Sender & Recipient information for the IERM.

Q&R: The Activity Diagram and the IERM both provide information to develop the Operational Scenario, which in turn, validates the activities and relationships presented in those documents.

Section 3

USIGS TECHNICAL ARCHITECTURE

3.1 Description

The Technical Architecture provides the minimal set of rules governing the arrangement, interaction, and interdependence of system parts or elements, whose purpose is to ensure that a conformant system satisfies a specified set of requirements (*C4ISR Architecture Framework 2.0).* The objective of the Technical Architecture is to promote efficiency and interoperability, and to ensure that developers can adequately plan for the introduction of evolving technology. To meet this objective, the Technical Architecture:

- Identifies standards, conventions, guidelines, and new technological capabilities needed to support operational requirements, concepts, and information flows
- Defines time-phased technical guidance to be implemented within systems and at key interface points between systems
- Identifies standards that guide development and implementation of the System Architecture
- Facilitates the migration to new technologies through the profiling of applicable standards and the identification of emerging technologies.

This process is continuous and constantly evolving – based on changing Operational and System Architecture foundations and emerging technology.

The Technical Architecture captures, refines, and establishes the common building blocks applicable to the overall architecture. This technical guidance can be tailored/profiled by user organizations to facilitate implementation of a structured, disciplined process of system development and evolution. This approach results in agreed-upon standards with a high degree of interoperability and a smoother systems development process. As emerging technology matures and standards become outdated, the Technical Architecture must evolve to establish new standards at reasonable, planned intervals–supporting both stability and progress.

The results of this effort are expressed in the USIGS Technical Architecture (UTA) as an evolving collection of fundamental application-level and infrastructure services, fundamental transaction and system component interfaces, applicable technical standards, and various inter-relationships among these constraints.

3.2 Major Influences

The USIGS Technical Architecture is influenced by and incorporates:

- Key technical reference models, including the DoD Technical Reference Model (TRM), the Defense Information Infrastructure Common Operating Environment (DII COE) Architecture, the Object Management Group's (OMG) Object Management Architecture (OMA), and the Open GIS Consortium (OGC) Services Architecture.
- Standards as mandated by the *DoD Joint Technical Architecture* (JTA), as profiled for the USIGS.
- A goal of open, interoperable systems based on distributed object computing.
- Emerging standards that are candidates to augment or replace existing mandated standards.

- A Technology Forecast which contains the results of analysis of potential enabling technologies for the IGC (as well as an analysis of information systems/industry trends that might conceivably lead to the development of new enabling technologies). New technologies may result in the emergence of standards that become candidates to augment or replace existing mandated standards.

3.3 USIGS Technical Architecture Products

The heart of the USIGS Technical Architecture (UTA) is the enumeration of the technologies that promote efficiency and interoperability. The UTA contains the following Technical Architecture products:

- The USIGS Technical Architecture Profile (UTAP):
  - Technical Reference Model(s)
  - Mandated Standards Profile of the DoD *Joint Technical Architecture*
  - Conventions and Guidelines
- The USIGS Standards Technology Forecast:
  - Emerging Technical Reference Model(s)
  - Emerging Standards
    - Emerging Technologies

3.3.1 USIGS Technical Architecture Profile (UTAP)

A Technical Reference Model (TRM) is a conceptual representation of the services and interfaces common to an Information System. A TRM provides a mechanism for identifying the key issues associated with applications portability, scalability, and interoperability.

A standards profile is a set or collection of one or more standards to be used collectively to standardize a specific interface, system, or enterprise across a community of systems or within an application area. A profile may contain individual standards that are further defined by a separate, authoritative document called a 'profile' or 'profile of a standard.'

A convention is defined as a non-standardized, but binding specification of practices typically used to maximize interoperability. In contrast to a convention, a guideline is a non-binding specification of accepted methods for non-standardized functionality. Guidelines are not requirements for implementation, but rather constitute 'good practice' among members of the USIGS community.

		Profile of a Standard		Base Standard		
Service	**JTA Section**	**Name(s)**	**Document Identifier(s)**	**Name(s)**	**Document Identifier(s)**	**Remarks**
(Imagery Data) [Still Imagery]	2.2.2.2.1.4.4			National Imagery Transmission Format (NITF 2.0)	MIL-STD-2500A w/notice #1, 7 Feb 1997	NITF is a part of the more inclusive National Imagery Transmission Format Standard (NITFS)
	2.2.2.2.1.4.4	Computer Graphics Metafile (CGM) Implementation Standard for the NITFS	MIL-STD-2301 w/ notice #1 12 Oct 1994	Computer Graphics Metafile	ANSI/ISO 8632	MIL-STD-2301 is a 'profile' of ANSI/ISO 8632
	2.2.2.2.1.4.4	JPEG as profiled for NITFS	MIL-STD-188-198A w/ notice #1 12 Oct 94	JPEG	ANSI/ISO 10918-1	Note: not interoperable with JFIF

Figure 3-1 Mandated Profile of the DoD Joint Technical Architecture Excerpt (sample)

Table 3-1 USIGS Technical Architecture Profile

Name: USIGS Technical Architecture Profile

Description and Purpose of Product:

The USIGS Technical Architecture Profile (UTAP) consists of:

- Technical Reference Model(s)
- Mandated Profile of the DoD Joint Technical Architecture
- Conventions and Guidelines

The USIGS Technical Architecture Profile (UTAP) includes an extension of the DoD Technical Reference Model (TRM). A TRM provides a high-level graphical representation of an information system domain showing major service areas and a more detailed textual description of services and interfaces. The USIGS will leverage existing, established reference models and extend them as necessary to support an imagery and geospatial perspective. The DoD TRM is extended for the USIGS to accommodate the Object Management Group's (OMG's) Object Management Architecture (OMA) and support for the DII COE. This extended model defines a set of services and interfaces common to the USIGS, and provides the construct to identify where standards are needed and where competing standards exist. The intent is to place the USIGS on a transition path toward a target environment characterized by distributed object computing and open, interoperable systems.

The USIGS Technical Architecture Profile (UTAP) includes a profile of the DoD Joint Technical Architecture (JTA) for use by the IGC. Thus, it is the approved list of standards for implementation within the USIGS. The UTAP is organized by reference model service categories and contains the minimum set of mandatory standards for each service area with which a system must comply if implementing that particular service. The Standards Profile cites the standards reference, a brief description and status of each standard and any supporting profile. A standards profile is a set or collection of one or more standards to be used collectively to standardize a specific interface, system, or enterprise across a community of systems or within an application area. A standards profile may contain individual standards that may be further defined by separate, authoritative documents, each of which is referred to as a 'profile' or a 'profile of a standard.' Each such profile further refines the implementation of the original standard to ensure interoperability.

Conventions are process or procedure specifications, not formally approved by an accepted standards organization, that describe organizational practices essential to information technology implementation. In the USIGS, conventions are agreed to within the IGC and have the same effect as standards in order to maximize interoperability.

Guidelines are recommended, but not required, practices. Whenever possible, USIGS guidelines will be aligned with those from other communities with which the USIGS must interoperate.

Audience: USIGS senior and mid-level managers, program executive officers, program managers, system architects, system developers, system operators

Creator/Maintainer: NIMA ST/ARU

Format: Multiple pages of text, figures, and tables

Applicable Tools: TBD

Dependent On: National Imagery and Mapping Agency (DoDD 5105.60); NIMA Business Plan; NIMA Work Plan; USIGS Activity Hierarchy; USIGS Activity Diagram; USIGS Information Exchange Requirements Matrix; USIGS systems descriptions; DoD Joint Technical Architecture; Object Management Group (OMG) Object Management Architecture (OMA), DII COE Specs.

Processes Influenced: Planning Process - Mandatory
Requirements Process - Mandatory
Resource Management - Guidance
Acquisition Process - Mandatory
Community Interaction - Dependent

Revision Cycle: Annually, or as required due to organization or mission changes

Controlling Authority: NCCB

Classification: UNCLASSIFIED

3.3.2 USIGS Standards Technology Forecast

Realizing that technology and associated standards evolve over time, this part of the UTA seeks to identify and discuss a variety of emerging reference models, standards, and technologies that are expected to have a significant effect in the Imagery and Geospatial Community (IGC). Emerging standards are those that are expected to augment or replace currently-mandated standards. Also discussed are those functional/interface areas where it is felt that standards are needed and where NIMA and the IGC must be proactive to facilitate technology and standards development.

4.2.3 The USIGS ISP of Basic Image Interchange Format (BIIF) NITF 2.0 will be superseded by NITF 2.1, MIL-STD 2500B (approved 22 August 1997 by the ISMC), and by the USIGS ISP of BIIF (ISO/IEC 12087-5 DIS) in the 1999 timeframe. NITF is the core of the NITF Suite of standards, and is coupled with additional standards for compression, graphics, and communications. It is mandated for all C4I systems disseminating secondary imagery, and is required for interoperability within the USIGS. The ISP and NITF 2.1 are technically equivalent and will not require software upgrades to maintain interoperability.

Figure 3-2 USIGS Emerging Standards Excerpt (sample)

The CORBA environment includes both CORBA services [CORBA97c] and CORBA facilities [CORBA97b] at the time of this writing (the components of each category are discussed in this document in Sections 2.2.4 and 2.2.3, respectively). There have been 14 CORBA services specified (Table 5-2) and one other (Collection Service) identified but not defined, but at the time of this writing, only a few were available as products from CORBA vendors and several were being reconsidered by OMG. Specifically, the Naming, Event, Transaction, Trader, and Security services were available as products from most, if not all, of the ORB vendors and the Persistence Service specification was in the process of being replaced by a more implementable specification with resulting products becoming available in the 1998-1999 timeframe. Others, such as the Security and Relationship Service specifications, are expected to be enhanced in the 1997-1998 timeframe with resulting products becoming available in the 1998-1999 timeframe. The longer term future should see refinement of the various service specifications, but there are no additional services envisioned as of the time of this writing.

Figure 3-3 USIGS Emerging Technologies Excerpt (sample)

Table 3-2 USIGS Standards Technology Forecast

Name: USIGS Standards Technology Forecast
Description and Purpose of Product: The Standards Technology Forecast consists of three parts: Emerging Technical Reference Model(s), Emerging Standards, and Emerging Technologies. The Emerging Technical Reference Model(s) discussion focuses on additional reference models of interest to the IGC. The Emerging Standards discussion focuses on specifications that may be included in the UTAP in the future. Such specifications may reflect either new standards or replacement for standards currently mandated in the UTAP. The Emerging Technologies discussion identifies the influences of future technologies that are likely to contribute to changes in the businesses processes and functional activities reflected in the USIGS Operational Architecture. This section also explores how existing USIGS standards will need to evolve, or be created, in order to enable appropriate implementations of these new technologies.
Audience: USIGS senior and mid-level managers, program executive officers, program managers, system architects, system developers, system operators
Creator/Maintainer: NIMA ST/ARU
Format: Multiple pages of text, figures, and tables
Applicable Tools: TBD
Dependent On: National Imagery and Mapping Agency (DoDD 5105.60); NIMA Business Plan; NIMA Work Plan; USIGS Activity Hierarchy; USIGS Activity Diagrams; USIGS Information Exchange Requirements Matrix; USIGS System Architecture; Information Technology Standards Guidance 3.1; DoD Joint Technical Architecture 1.0, DII COE Specifications.
Processes Influenced: Planning Process - Guidance Requirements Process - Guidance Resource Management - Guidance Acquisition Process - Guidance Community Interaction - Dependent
Revision Cycle: Annually, or as required due to organization or mission changes.
Controlling Authority: NCCB
Classification: UNCLASSIFIED

3.4 USIGS Technical Architecture Relationships to Other USIGS Architecture

Based on requirements derived from the USIGS Operational Architecture Description, the USIGS Technical Architecture provides the basis for a synergistic relationship among all elements of the USIGS Architecture. Figure 3-4 graphically depicts these relationships.

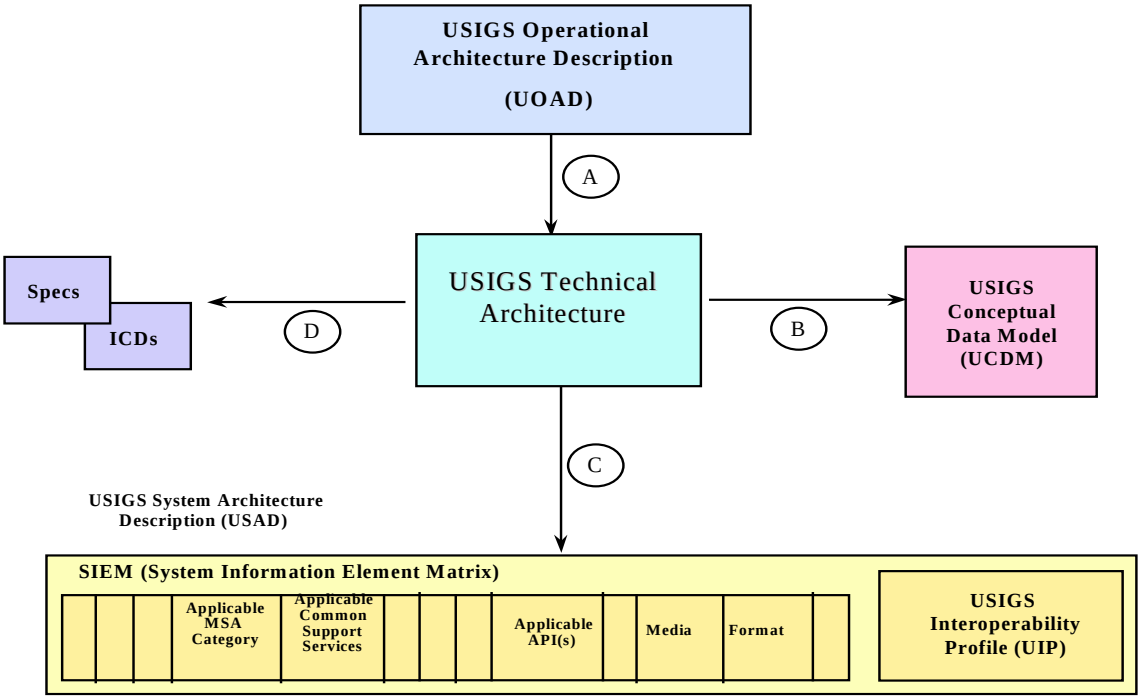


Figure 3-4 USIGS Technical Architecture Relationships

A: The UOAD identifies activities for which services must be provided. The USIGS Technical Architecture identifies the standards specifications that are necessary to satisfy those requirements.

B: The Technical Architecture mandates the use of the USIGS Conceptual Data Model, which standardizes data element usage in the USIGS. The USIGS Object Model included in the UTA provides the logical linkage between USIGS services and the UCDM. The Technical Architecture also identifies data standards that must be used in the UCDM e.g., Feature Attribute Coding Catalog (FACC).

C: The Technical Architecture identifies the Mission Specific Application categories, the applicable common support services, and applicable APIs for the SIEM. These items are mapped to the Operations Activities identified in the USIGS Operational Architecture.

D: The Technical Architecture identifies: 1) applicable formal standards specifications, 2) local-standards specifications, and 3) legacy standards that may be used by Interface Control Documents (ICDs) or other forms of specification.

Section 4
USIGS SYSTEM ARCHITECTURE

4.1 Description

The *C4ISR Architecture Framework* describes the primary purpose of a system architecture as enabling or automating operational activities through physical processes. Today within the USIGS and NIMA, operational requirements are met through the combined efforts of a number of tailored individual systems which are each designed to meet very specific requirements. While this network of discrete systems has the advantage of providing focused local support capabilities, and redundant capabilities USIGS-wide, it lacks the ability to rapidly reconfigure in response to changing customer needs, or to systematically incorporate technology advances. It also lacks the characteristics needed to support future compliance with USIGS Operational and Technical Architectures, and the Conceptual Data Model. Key future USIGS characteristics include: interoperability, seamless data access, and JTA/DII COE compliance.

As NIMA, and other USIGS imagery and geospatial production organizations, transition from their current role as providers of "products" to providers of "information and services," the USIGS System Architecture must also evolve to reflect this paradigm shift. The USIGS Migration Plan describes the approach for evolving multiple "As-Is" systems into a single, integrated "To-Be" system, the USIGS. USIGS System Architecture products with multiple views are needed to facilitate this transition.

"As-Is" System View

The "As-Is" USIGS System Architecture describes operational capabilities in terms of existing NIMA systems. This view of the system architecture is critical to establishing the baseline starting point for executing near term migration goals. "As-Is" system products describe interface relationships and interoperability profiles and standards (USIGS System/Segment Element Interface Diagram and USIGS System/Segment Element Interface Matrices).

"To-Be" System View

The "To-Be" USIGS System Architecture Description (USAD) view reflects the paradigm shift as multiple systems are replaced by interoperable software services comprised of common and mission specific software applications. "To-Be" system architecture products describe the USIGS functional components, their configurations and linkages (System Element Interface Description), system interface relationships (System Information Exchange Matrices), and interoperability profiles and standards (USIGS Interoperability Profile).

4.2 Major Influences

- NIMA Business Plan
- NIMA *Operations Directorate Vision*
- *IGC Operations Vision*
- USIGS Operational Architecture Description
- USIGS Technical Architecture
- USIGS Conceptual Data Model

4.3 USIGS System Architecture Products

The USIGS is the single, integrated system evolving from multiple systems to support the Imagery and Geospatial Community (IGC) for acquisition and production of imagery, imagery intelligence, and geospatial information. USIGS System Architecture products describe the system architecture comprising the USIGS, and define implementation requirements that must be met by vendors and development contractors providing the components of the USIGS in support of the IGC.

The USIGS System Architecture Description is a three-volume set that documents the System Architecture products. It provides USIGS Architecture direction to NIMA organizations, supporting development offices, and contractors. For organizations outside NIMA, these products provide information and guidance to enable them to plan and program technical and infrastructure capabilities that will ensure responsive, interoperable access to imagery, imagery intelligence, and geospatial information.

Volume I is the "To-Be" System Architecture Description. It provides graphic depiction's of the USIGS functional components, their configurations and linkages, and details internal and external information exchanges, processing, and storage requirements. Volume I describes the "To-Be" USIGS architecture through two products: the System Element Interface Description (SEID) and the System Information Exchange Matrix (SIEM). In addition, this volume explains the architectural concepts being implemented in compliance with the DII COE and the JTA, and the relationship among these components and various USIGS products.

System Architecture products build upon information documented by the Operational and Technical Architectures, and the Conceptual Data Model. These relationships are illustrated in Figure 4-1.

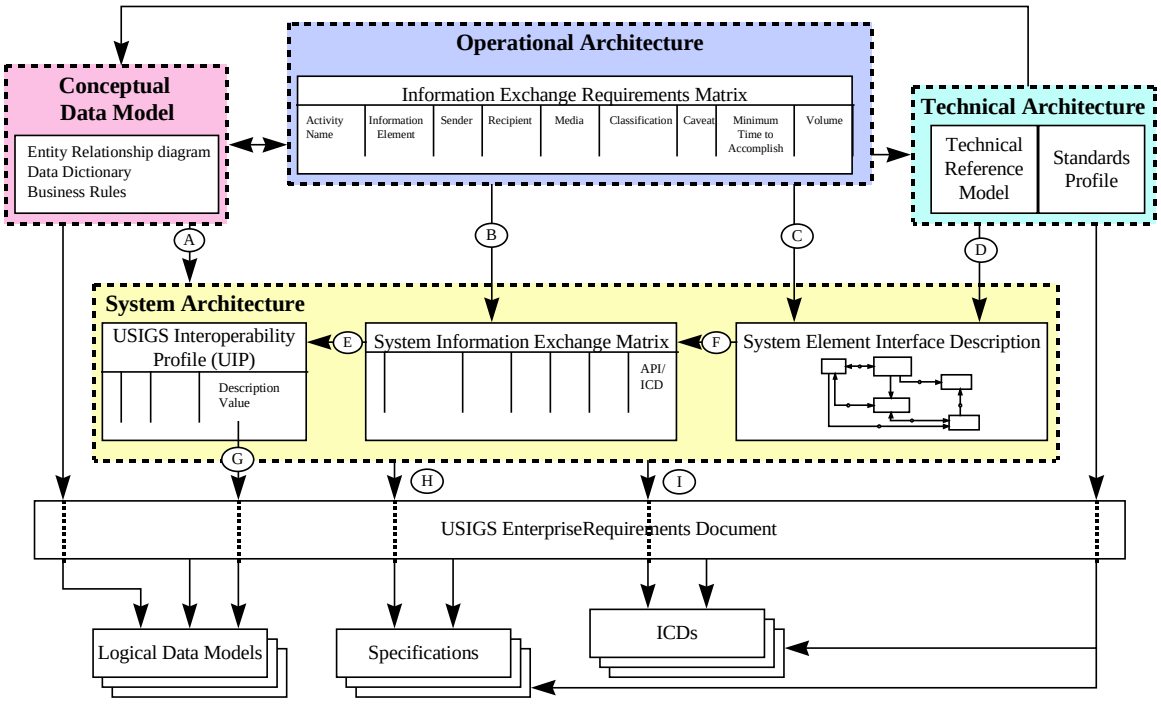


Figure 4-1 USIGS Architecture Interrelationships

The information flowing on the numbered lines of Figure 4-1 represents the following information flows:

A: The Conceptual Data Model is the foundation for the System Information Exchange Matrix (SIEM) interface data and UIP to build upon.

B: Operational Architecture provides processing and information exchange requirements to the System Architecture and the System Architecture validates and assigns applications and services to the Operations Activity.

C: The System Element Interface Description (SEID) describes the “To-Be” System Architecture which fulfills the “To-Be” activities from the IERM.

D: The USIGS Technical Architecture identifies the specifications and standards (current mandates and basic rules / guidelines) that are identified in the UIP, SEID, and SIEM.

E: The SIEM identifies the existence of interfaces and the UIP ensures their consistency with the UTA Standards Profile for interoperability.

F: The SEID identifies the functional components and interfaces and maps directly to the SIEM where the SIEM assigns applications and services.

G: The UIP defines the implementation details of software interfaces for interoperability.

H: USIGS Enterprise Requirements Document can be formed from the information contained in the System Architecture’s SEID, SIEM, and UIP.

I: The SIEM identifies ICDs that are applicable to a specific interface (if any exist).

The System Information Exchange Matrix included in Volume I is a key product that links the Operational, Technical, Data and other System Architecture products. These relationships are depicted in Figure 4-2.

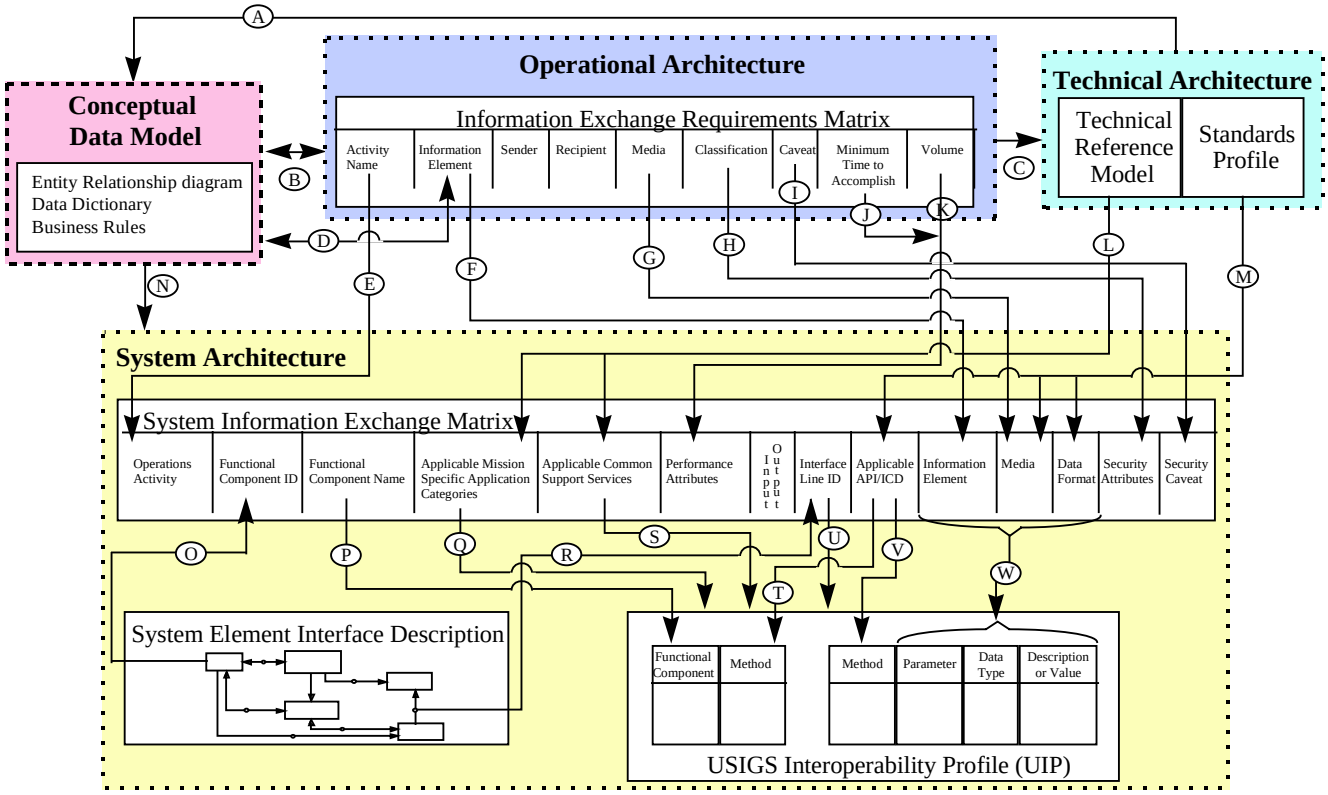


Figure 4-2 USIGS Architecture Product Information Flow-down

The information flowing on the numbered lines of Figure 4-2 represents the following information flows:

A: The Technical Architecture mandates the use of the USIGS Conceptual Data Model, which standardizes data element usage in the USIGS.

B: The UOAD identifies information needs to the UCDM

C: The UOAD identifies requirements for which services must be provided. The USIGS Technical Architecture identifies the standards specifications that are necessary to satisfy those requirements.

D: IERM Information Element maps to the Data models in the UCDM.

E: Information Exchange Requirements Matrix (IERM) Activity Name maps directly to the System Information Exchange Matrix (SIEM) Operations Activity.

F: IERM Information Element maps directly to the SIEM Information Element.

G: IERM Media maps directly to the SIEM Media: E, D, H, T, F, V.

H: IERM Classification maps directly to the SIEM Security Attributes: TS/SCI, S, U.

I: IERM Caveat maps to the SIEM Security Caveat.

J: IERM Minimum Time to Accomplish and Volume will map to the SIEM Performance Attributes.

K: IERM Minimum Time to Accomplish and Volume will map to the SIEM Performance Attributes.

L: SIEM Applicable Mission Specific Application Categories and Applicable Common Support Services are selected from the Technical Reference Model (TRM) and perform the functions necessary to achieve the Operations Activity.

M: The Standards Profile identifies the specifications and standards (current mandates and basic rules/guidelines) that drive the SIEM Applicable API/ICD, Media and Data Format.

N: The Conceptual Data Model is the foundation for SIEM interface data and UIP to build upon.

O: The SEID identifies the Functional Component Name and maps it directly to the SIEM.

P: SIEM Functional Component Name maps to the USIGS Interoperability Profile (UIP) Functional Component.

Q: The UIP will profile SIEM Applicable Mission Specific Application Categories mapped from the TRM to ensure interoperability when implemented.

R: The SEID identifies the Interface Line ID and maps it directly to the SIEM.

S: The UIP will profile SIEM Applicable Common Support Services mapped from the TRM to ensure interoperability when implemented.

T: SIEM Applicable API/ICD maps to the UIP method.

U: SIEM Interface Line ID identifies the existence of interfaces and the UIP will ensure their consistency with the UTA Standards Profile for interoperability.

V: SIEM Applicable API/ICD maps to the UIP method.

W: The Standards Profile identifies the specifications and standards (as in line 13) that are implemented by the UIP and identified in the SIEM.

Volume II, the USIGS Interoperability Profile (UIP), is designed to facilitate interoperability and seamless access between multiple clients and services within the IGC. The UIP provides a tailored, system-specific interface (system-to-system) standards profile through selection of common interface standards required for implementation in specific USIGS systems. Key interfaces are defined along with critical interface data interchange standards necessary to insure interoperability and connectivity between heterogeneous systems.

Volume III, the "As-Is" System Architecture Description, describes the current USIGS architecture through two products: the USIGS System/Segment Element Interface Diagram and the USIGS System/Segment Element Interface Matrix. The USIGS System/Segment Element Interface Diagram indicates which As-Is USIGS Architecture Systems/Segments share an interface. The USIGS System/Segment Element Interface Matrix provides details of that interface.

System Architecture products include:

- USIGS System Element Interface Description "To-Be" (Volume I)
- USIGS System Information Exchange Matrix "To-Be" (Volume I)
- USIGS Interoperability Profile (UIP) (Volume II)
- USIGS System/Segment Element Interface Diagram "As-Is" (Volume III)
- USIGS System/Segment Interface Matrix "As-Is" (Volume III)

4.3.1 USIGS System Element Interface Description "To-Be" (Volume I)

The USIGS System Element Interface Descriptions (SEIDs) are top level pictorial depictions of the USIGS Elements, their configurations, and linkages. These views provide a pictorial realization of the Operations Vision and Operations Architecture which allows early analysis of internal and external information exchanges, processing, storage requirements, and operational concept feasibility.

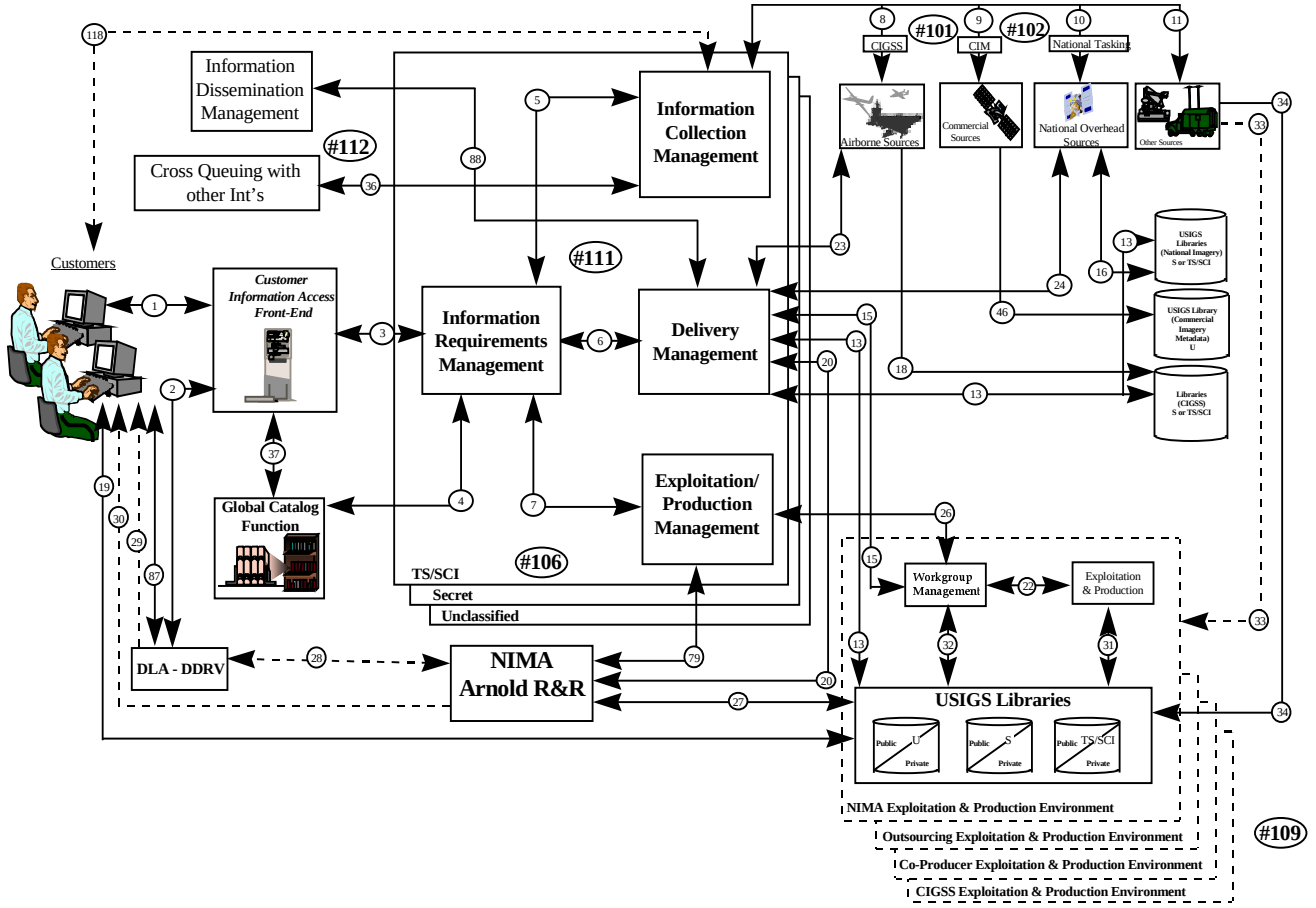


Figure 4-3 USIGS System Element Interface Description "To-Be"(sample)

Table 4-1 USIGS System Element Interface Description "To-Be"

Name: USIGS System Element Interface Description
Description and Purpose of Product: The System Element Interface Descriptions are top level pictorial depiction's of the USIGS Elements, their configurations, and linkages. These views provide a pictorial realization of the Operational Architecture which allows early analysis of internal and external information exchanges, processing, storage requirements, and operational concept feasibility.
Audience: USIGS senior and mid-level managers, program managers, system architects, system integrators, developers and vendors.
Creator/Maintainer: NIMA ST/ARU
Format: Graphic Views with Text
Applicable Tools: Future versions of the Joint C4ISR Architecture Planning/Analysis System (JCAPS) plan to have the capability to ingest and/or generate some, or all, of this product from data provided in the other USIGS products.
Dependent On: *NIMA Operations Directorate Vision, IGC Operations Vision,* USIGS Operational Architecture Information Exchange Requirements Matrix (IERM), USIGS Technical Architecture
Processes Influenced: Planning Process - Mandatory Requirements Process - Mandatory Resource Management - Mandatory Acquisition Process - Mandatory Community Interaction - Dependent **Revision Cycle:** As required by modifications to the USIGS Operational and Technical Architecture
Controlling Authority: NCCB
Classification: TS/TK

4.3.2 USIGS System Information Exchange Matrix "To-Be" (Volume I)

The System Information Exchange Matrices (SIEMs) are tabular format depiction's of applications/services and their information exchanges between nodes. This product traces the path of an information exchange from its source to its destination describing system specific details such as protocols, data or media formats, security constraints, and performance characteristics. Its purpose is to link together the Operational, System, and Technical Architectures by mapping Applications/Services to Operational Architecture Activities and to expose information exchange requirements.

Operations Activity	Functional Component ID	Functional Component Name	Applicable Mission Specific Application Categories	Applicable Common Support Services	Performance Attributes	I/O	Interface Line ID	Applicable API/ICD	Information Element	Media	Data Format	Security Attributes	Security Caveat
A22221 Pass Validated Requirement	C034	Information Requirements Management	Workflow Management	TBD	TBD	**I**							
						O	F005	TBD	Requirements	H,D,E	TBD	SCI/S/U	SH
A22222 Submit Requirement to Nat'l Collector	C032	Information Collection Management	Workflow Management	TBD	TBD	**I**							
						O	F010	TBD	Nat'l Imagery Requirement	H,E	TBD	SCI/S/U	SH,RL,N/A
A22222 Submit Requirement to Other Collector	C032	Information Collection Management	Workflow Management	TBD	TBD	**I**							
						O	F011	TBD	Geospatial Information Requirement	H,D,E	TBD	SCI/S/U	RL,N/A
A22222 Submit Requirement to Airborne Collectors	C032	Information Collection Management	Workflow Management	TBD	TBD	**I**							
						O	F008	TBD	Airborne Imagery Requirement	H,D,E	TBD	SCI/S/U	SH,RL,N/A

Figure 4-4 USIGS System Information Exchange Matrix "To-Be" (sample)

Table 4-2 USIGS System Information Exchange Matrix "To-Be"

Name: System Information Exchange Matrix **Description and Purpose of Product:** The System Information Exchange Matrices are tabular format depiction's of applications/services and their information exchanges between nodes. This product traces the path of an information exchange from its source to its destination describing system specific details such as protocols, data or media formats, security constraints, and performance characteristics. Its purpose is to link together the Operational, System, and Technical Architectures by mapping Applications/Services to Operational Architecture Activities and to expose information exchange requirements.
Audience: USIGS senior and mid-level managers, program managers, system architects, system integrators, developers and vendors.
Creator/Maintainer: NIMA ST/ARU
Format: Tabular Matrix
Applicable Tools: The DOORS tool, used to manage functional requirements, will show where the incoming needs will map to the USIGS Architecture through the SIEM. The SIEM will then point to applicable acquisition efforts which will satisfy each of the system requirements. Future versions of the Joint C4ISR Architecture Planning/Analysis System (JCAPS) plan to have the capability to ingest and/or generate some, or all, of this product from data provided in the other USIGS products.
Dependent On: *NIMA Operations Directorate Vision*, *IGC Operations Vision*, USIGS Information Exchange Requirements Matrix (IERM), USIGS Technical Architecture
Processes Influenced: Planning Process - Mandatory Requirements Process - Mandatory Resource Management - Mandatory Acquisition Process - Mandatory Community Interaction - Dependent **Revision Cycle:** As required by modifications to the USIGS Operational and Technical Architecture
Controlling Authority: NCCB
Classification: TS/TK

4.3.3 USIGS Interoperability Profile (UIP) (Volume II)

The USIGS Interoperability Profile (UIP) defines profiles of interface standards used to achieve interoperability between multiple clients and servers within the USIGS Architecture. Key interfaces are defined along with critical data interchange standards to assure interoperability and connectivity among the various functional components. By outlining a set of standards and standards profiles, the UIP details specific interface behavior, thereby defining the minimum requirements for access and connectivity among these components.

1.0 Introduction
- 1.1 Scope
- 1.2 Purpose
- 1.3 Document Organization

2.0 Applicable Documents
- 2.1 Government Documents
- 2.2 Non-Government Documents
- 2.3 Other Documents

3.0 Not Used

4.0 Interoperability Requirements
- 4.1 Infrastructure Services
- 4.2 Distributed Computing Services
- 4.3 Open Geospatial Exchange (OGE) Services
- 4.4 USIGS Standard Data Formats
- 4.5 USIGS Metadata Requirements

5.0 Verification
- 5.1 Verification Methods
- 5.2 Interoperability Certification
- 5.3 Testing
- 5.4 Intersystem Demonstrations

6.0 Notes
- 6.1 Acronyms

10 Appendix 10 - NITF 2.0 Header/Subheader Formats
- 10.1 NITF 2.0 File Header Format
- 10.2 NITF 2.0 Image Sub-Header Format
- 10.3 NITF 2.0 Symbol Sub-Header Format
- 10.4 NITF 2.0 Text Sub-Header Format

20 Appendix 20 - Scenarios And Use Case (TBD-027)

Figure 4-5 USIGS Interoperability Profile (UIP) (sample)

Table 4-3 USIGS Interoperability Profile (UIP)

Name: USIGS Interoperability Profile **Description and Purpose of Product:** The USIGS Interoperability Profile (UIP) defines profiles of interface standards to be used to achieve interoperability between multiple clients and servers within the USIGS Architecture. Key interfaces are defined along with critical data interchange standards to assure interoperability and connectivity among the various functional components. By outlining a set of standards and standards profiles, the UIP details specific interface behavior, thereby defining the minimum requirements for access and connectivity among these components.
Audience: USIGS mid-level managers, program managers, system architects, system integrators, developers and vendors.
Creator/Maintainer: NIMA ST/ARU
Format: Text document with annotated graphics
Applicable Tools: For all functional requirements, the DOORS tool will track compliance with the interface standards and definitions specified in the UIP.
Dependent On: USIGS Technical Architecture, USIGS Conceptual Data Model, USIGS System Information Exchange Matrix, *DoD Joint Technical Architecture v2.0*, DII COE I&RTS.
Processes Influenced: Planning Process - Guidance Requirements Process - Mandatory Resource Management - Guidance Acquisition Process - Mandatory Community Interaction - Dependent **Revision Cycle:** Semi-Annual or as required by modifications to products dependent on
Controlling Authority: NCCB
Classification: Unclassified

4.3.4 USIGS System/Segment Element Interface Diagram "As-Is" (Volume III)

The USIGS System/Segment Element Interface Diagram displays all the system/segments that comprise the As-Is USIGS architecture along its diagonal and illustrates an interface between two systems/segments with a symbol along the intersection of a column and a row. For each marked interface, at least one USIGS System/Segment Element Interface Matrix (one for each interface) will exist that describes the interface in detail.

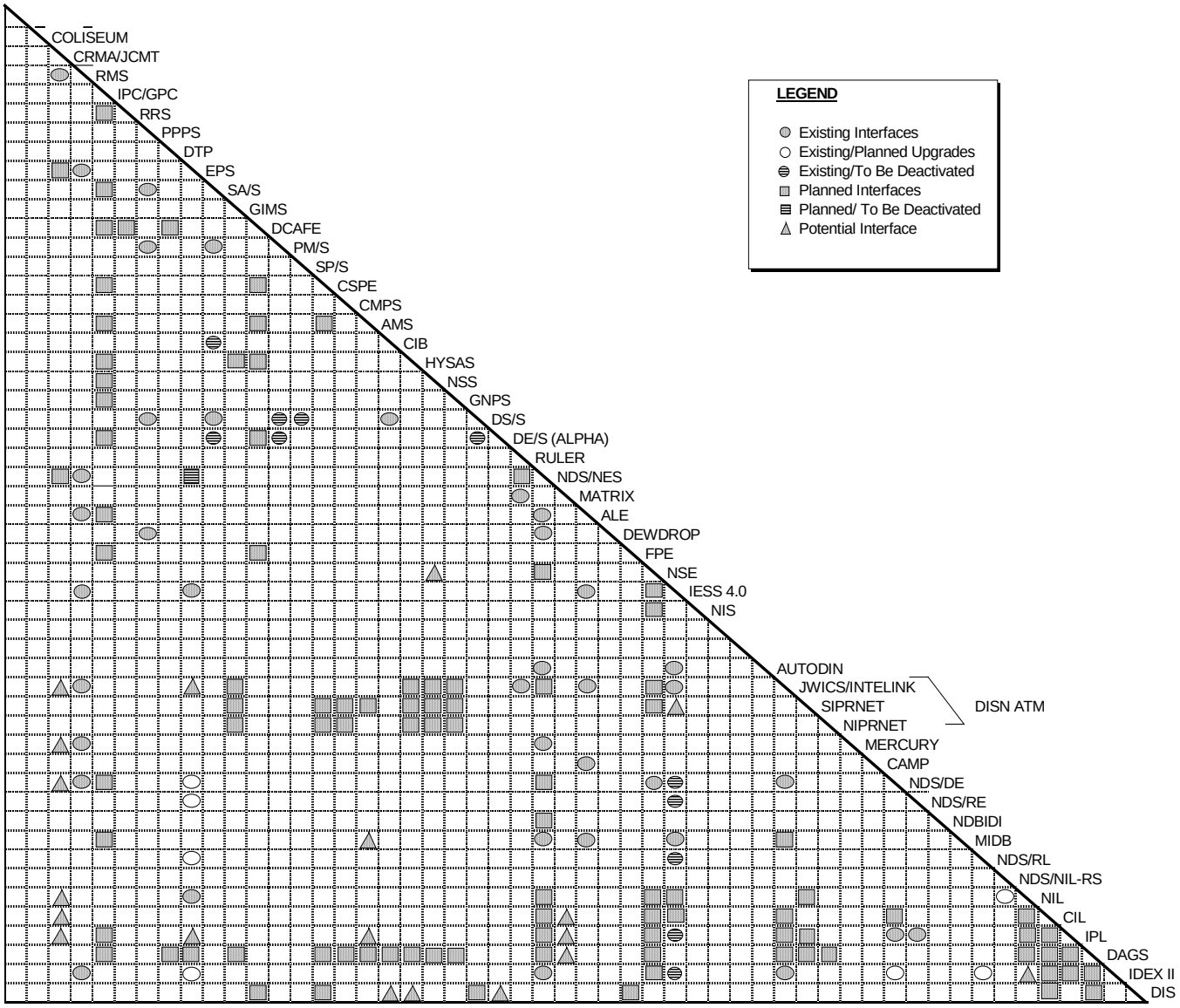


Figure 4-6 USIGS System/Segment Element Interface Diagram "As-Is" (sample)

Table 4-4 USIGS System/Segment Element Interface Diagram "As-Is"

Name: USIGS System/Segment Element Interface Diagram **Description and Purpose of Product:** The USIGS System/Segment Element Interface Diagram displays all the system/segments that comprise the As-Is USIGS architecture along its diagonal and illustrates an interface between two systems/segments with a symbol along the intersection of a column and a row. For each marked interface, at least one USIGS System/Segment Element Interface Matrix (one for each interface) will exist that describes the interface in detail.
Audience: USIGS senior and mid-level managers, program managers, system architects, system integrators, developers and vendors.
Creator/Maintainer: NIMA ST/ARU
Format: Graphic
Applicable Tools: Future versions of the Joint C4ISR Architecture Planning/Analysis System (JCAPS) plan to have the capability to ingest and/or generate some, or all, of this product from data provided in the other USIGS products.
Dependent On: USIGS System Inventory
Processes Influenced: Planning Process - Guidance Requirements Process - Guidance Resource Management - Guidance Acquisition Process - Guidance Community Interaction - Dependent **Revision Cycle:** None
Controlling Authority: NCCB
Classification: Unclassified

4.3.5 USIGS System/Segment Element Interface Matrix "As-Is" (Volume III)

The USIGS System/Segment Element Interface Matrices provide details to the interfaces illustrated in the USIGS System/Segment Element Interface Diagram. They provide information on the hardware and software of the receiver and sender systems/segments and the networks that are being used. They also give the communication standards that are being used as well as the data that will be exchanged. If an ICD controls the interface, then it will be referenced.

SYSTEM INTERFACE

Sender	Receiver	Classification	Security Protocols
DE/S DEC Alpha	**DS/S**	**TS/SCI**	**None**

COMMUNICATIONS

Network Media	Bandwidth	Trans. Protocol	Mgmt.Protocol
Internal FDDI	**100Mbps**	**BCS**	**None**

HARDWARE

Provider	Mode	System Type	Int. Ctl. Doc.	Through-put
Sender: DE/S **Receiver: DS/S**	**FD** **FD**	**DEC Alpha** **IBM 9021-600**	**EIF 90096** **EIF 90095**	**100Mbps** **100Mbps**

SOFTWARE

OS/NOS Version	Application/Version (COTS/GOTS))
Sender: VAX Open VMS AXP **Receiver: MVS/ESA**	**DEC Ada and Oracle Rdb for VMS AXP** **M204 UL, Ada, C, FORTRAN**

SERVICE

Purpose of Message/Data Transmission	Message Format/Data Format
Query, Order	**DRG, FAF Imagery, TINT Data, PSD, TERCOM-T** **KBS Rules, TIP, SUP MC&G, EMT, Matrix**

DATA TYPE

Wideband/ Narrowband	Compression Rate	Data Flow	Digital/ Analog	Data Format	Media
Wideband	**N/A**	**BI**	**Sync**	**WBDL**	**Comm Network**

Figure 4-7 USIGS System/Segment Element Interface Matrix "As-Is" (sample)

Table 4-5 USIGS System/Segment Element Interface Matrix "As-Is"

Name: USIGS System/Segment Element Interface Matrix **Description and Purpose of Product:** The USIGS System/Segment Element Interface Matrices provide details to the interfaces illustrated in the USIGS System/Segment Element Interface Diagram. They provide information on the hardware and software of the receiver and sender systems/segments and the networks that are being used. They also give the communication standards that are being used as well as the data that will be exchanged. If an ICD controls the interface, then it will be referenced.
Audience: USIGS mid-level managers, program managers, system architects, system integrators, developers and vendors.
Creator/Maintainer: NIMA ST/ARU
Format: Graphic
Applicable Tools: Future versions of the Joint C4ISR Architecture Planning/Analysis System (JCAPS) plan to have the capability to ingest and/or generate some, or all, of this product from data provided in the other USIGS products.
Dependent On: USIGS System/Segment Element Interface Diagram, USIGS System Inventory
Processes Influenced: Planning Process - Guidance Requirements Process - Guidance Resource Management - Guidance Acquisition Process - Guidance Community Interaction - Dependent **Revision Cycle:** None
Controlling Authority: NCCB
Classification: Classified (TS/TK)

4.4 USIGS System Architecture Product Linkages

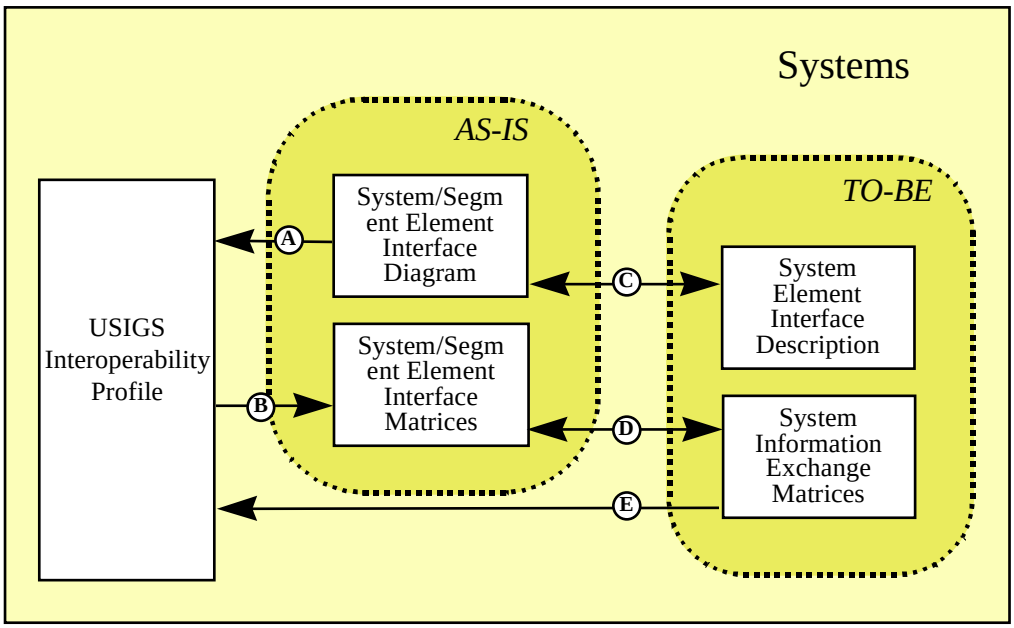


Figure 4-8 USIGS System Architecture Product Linkages

A: The “As-Is” Systems/Segment Element Interface Diagram is used to indicate where interfaces exist between systems which may be profiled in the UIP.

B: UIP compliant systems are indicated in the Interface control document column of the System/Segment Element Interface Matrices.

C: The “As-Is” System/Segment Element Interface Diagram is used to provide insight into where interfaces need to exist in system elements depicted in the “To-Be” System Element Interface Descriptions.

D: The “As-Is” System/Segment Element Interface Matrices are used to provide insight into the details of the interfaces depicted in the “To-Be” System Information Exchange Matrices.

E: The “To-Be” System Information Exchange Matrices are used to indicate where interfaces exist between system elements which may be profiled in the UIP.

Section 5

USIGS CONCEPTUAL DATA MODEL

5.1 Description

Central to the USIGS architecture is a robust data environment that facilitates the creation and management of accurate, precise, detailed, and timely data. The USIGS Conceptual Data Model (UCDM) consists of a set of data models, standardization procedures established by DoD, NIMA and the IGC, and the interfaces necessary to integrate the Conceptual Data Model with other architecture components. Through this structure, data is standardized horizontally at various levels throughout the enterprise, while maintaining vertical traceability.

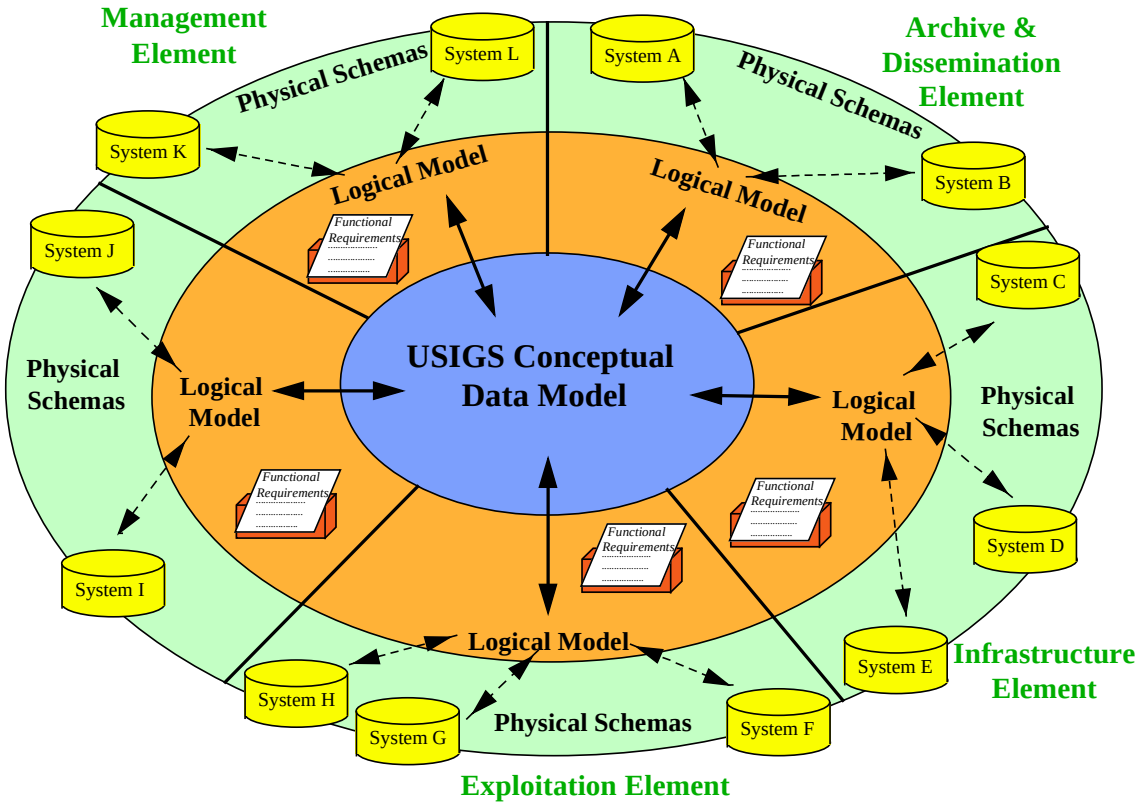


Figure 5-1 Data Model Interrelationships Within the USIGS Architecture

Figure 5-1 depicts the hierarchy of data models within USIGS, and the three tiers at which they are related. The construction, alignment and maintenance of the different model types is an iterative process that reflects changes in the operational mission and scope. The USIGS Conceptual Data Model (UCDM) provides a semantically rigorous, functionally neutral, normalized definition of the data needed to satisfy the combined information requirements for the community. The model's entities and attributes are consistent with the standardized data contained in the DoD Data Dictionary System (DDDS). In addition, they are controlled and cited in the Technical Architecture. Development of the conceptual model is correlated with the USIGS Information Exchange Requirements Matrix (IERM), as well as the operational vision that defines the business rules and strategies that govern the enterprise.

Existing NIMA configuration control processes and the NIMA Configuration Control Board (NCCB) are the mechanisms to control and manage the UCDM, the Logical Data Models (LDMs) and the Physical Data Model (Internal Schema), and to keep them synchronized. The UCDM is maintained by NIMA/AR. LDMs and Physical Data Models (Internal Schema) are developed and maintained by program offices. LDMs extend the UCDM to the level of detail needed for specific functions and performance characteristics. LDMs must conform fully to the UCDM. The LDM is the basis for the Physical Data Model for specific applications.

System developments within a business element, evolve functional requirements through a sub-set of the conceptual model by isolating those data elements and business rules specific to the requirement. The result is a logical data model that is tailored to the needs of that element, yet compliant and aligned with the conceptual model. During the creation of the logical data model, new data requirements may be fed back to the conceptual data model. Where business elements have overlapping data requirements, their models will be in agreement, through alignment with the UCDM.

Developers initially examine the UCDM and the associated data dictionary to determine whether UCDM data elements satisfy their requirements. If the UCDM does not contain all the required entities and attributes, the developer uses the applicable parts of the UCDM and proposes an extension to the UCDM via a Request for Change for those data elements which are publicly visible. For entities and attributes which are not yet publicly visible (i.e., used only by the specific application), the data requirements are documented in the LDM and the LDM is placed under NCCB control, but the UCDM is not extended. Developers of LDMs collaborate with NIMA/AR during LDM development to ensure conformity of LDMs to the UCDM.

During system design, the logical data model and system performance criteria are used to create a physical data base design (or internal schema). This data base design can impact, or be impacted by, choice of software, allocations to storage, and other hardware needs, in response to system requirements. In addition, considerations of security, access and distribution may impact the physical design. New system requirements are fed back to the systems logical model. When the physical implementation of the LDM surfaces the need to change the LDM and/or UCDM, developers submit RFCs to modify the LDM and the UCDM (for publicly visible elements).

From a user's perspective, the USIGS Conceptual Data Model supports the concepts of seamless information discovery and access across the enterprise, and provides for a virtual information service, thus increasing interoperability among data holdings. Data access should allow transactions across a spectrum of resources without the user's awareness; there should be no need to perform parsing, patching or joining at seams caused by either production handling, data content or storage limitations.

The USIGS Conceptual Data Model enhances production and exploitation processes by supporting co-production, facilitating value-added-updates, maximizing the ability to share data, and minimizing errors in data re-use. Data will meet certain conditions, particularly, uniqueness, consistency, integrity, error detection and correcting at both logical and semantic levels, to ensure that the right data is applied to the right activity. From a data management perspective, the maintenance of data in this environment is far more efficient, and cost effective than in a less structured schema. For example, the Conceptual Data Model provides the ability to analyze data across the enterprise. As a result, redundant data can be identified and, wherever appropriate, eliminated.

For the development community, a structured data environment reduces the cost, complexity, and overall level of resources expended on the development of software and computer system data components. This structure is necessary for the efficient exchange of data either as an exchange format or as information requirements of an application program interface (API) specification. Data models can guide development of systems that are capable of sharing data at the most elemental level, including access of the same physical store. This architecture encourages the definition of common operational 'concepts' over areas of shared data, migration of legacy and other data to a shared environment, while minimizing operations impact. A robust data environment must also promote rapid integration of emerging technology and standards. Standards, both national and international, will be incorporated to exploit the competitive development of off-the-shelf solutions.

In summary, data is common to all components of USIGS. The ever-increasing quantities of a multitude of data types pose significant obstacles for users, managers and developers. By adopting a Conceptual Data Model which combines an integrated data model implementation, a solid data standardization strategy, and architecture-wide integration of data elements, USIGS will have the structure and flexibility necessary to meet the challenges that lie ahead.

5.2 Major Influences

The *C4ISR Framework* describes a core set of architecture products and functionality, as a minimal set of rules concerning the arrangement, interaction, and interdependence of the parts or elements of a C4ISR system. Implied in these rules is a data environment which, from a data perspective, ties together the Operational, Technical, and Systems Architecture through a common information infrastructure. This set of rules serves to ensure that a conforming system will successfully satisfy its specified operational requirements. The USIGS Conceptual Data Model reflects:

- Requirements defined in the USIGS Operational Architecture Description
- Existing data models reflecting standardized data elements or candidate standard elements as contained in the Defense Data Dictionary System (DDDS) and Secure Intelligence Data Repository (SIDR)
- Existing Imagery and Geospatial Community-related Shared Data Environment (SHADE) reusable Reference Data Sets and Database Segments
- Evolving Intelligence and DoD Data Modeling efforts
- Physical database schemas and information exchange requirements of existing systems or applications as documented in the USIGS Systems Architecture Description
- Impact of evolving technologies on the role and importance of data standardization
- Data standards identified in the USIGS Technical Architecture

5.3 USIGS Conceptual Data Model

The USIGS Conceptual Data Model (UCDM) describes the common information used by the business elements of USIGS. It contains three components: a fully attributed entity relationship diagram, a data dictionary, and a representation of business rules and relationships between data.

The entity relationship diagram and business rules are represented in standard IDEF1X graphic format (see Figure 5-2, 1st view). The data dictionary defines and describes in detail all elements reflected in the graphics . The information is organized by entity, attribute, and acceptable domain value (see Figure 5-2, 2nd view). Although the data model published reports are represented as graphic and dictionary excerpts, the two are integrated in the master database, and managed using the ERWIN modeling tool.

"The USIGS Conceptual Data Model is compliant with FIPS Publication 183, *Integrated Definition for Information Modeling (IDEF1X*)and DoD Manual 8320.1-M-1, *Data Standardization Procedures* as mandated by DOD Directive 8320.1, *Data Administration.* DISA provides a repository for the centralized management of the DoD data standards and related information. The Defense Data Dictionary System (DDDS) is the primary tool to support the DoD Data Administration Program in developing and managing standard data in accordance with Directive 8320.1. It provides a mechanism for defining metadata; cross-referencing and consistency checking; and supports the standardization of data element names, definitions, and relationships. The Personal Computer Access Tool (PCAT) is a PC version of the DDDS. The PCAT is easy to use and allows users the flexibility to design their own queries against the DDDS holdings. The USIGS Data Model and the definitions and associated metadata for the data elements derived from the model comply with the requirements of DoD 8320.1-M-1. Many of the data elements in the USIGS DM are in the DDDS either as approved DoD Data Standards or in developmental status. Extensions to the UCDM will continue to be consistent with 8320.1-M-1 and DDDS requirements. However, the focus of the Conceptual Data Model team is on expanding the model to meet USIGS requirements. As time and resources permit, additional data elements derived from the UCDM will be submitted to the DDDS and the DoD approval process.

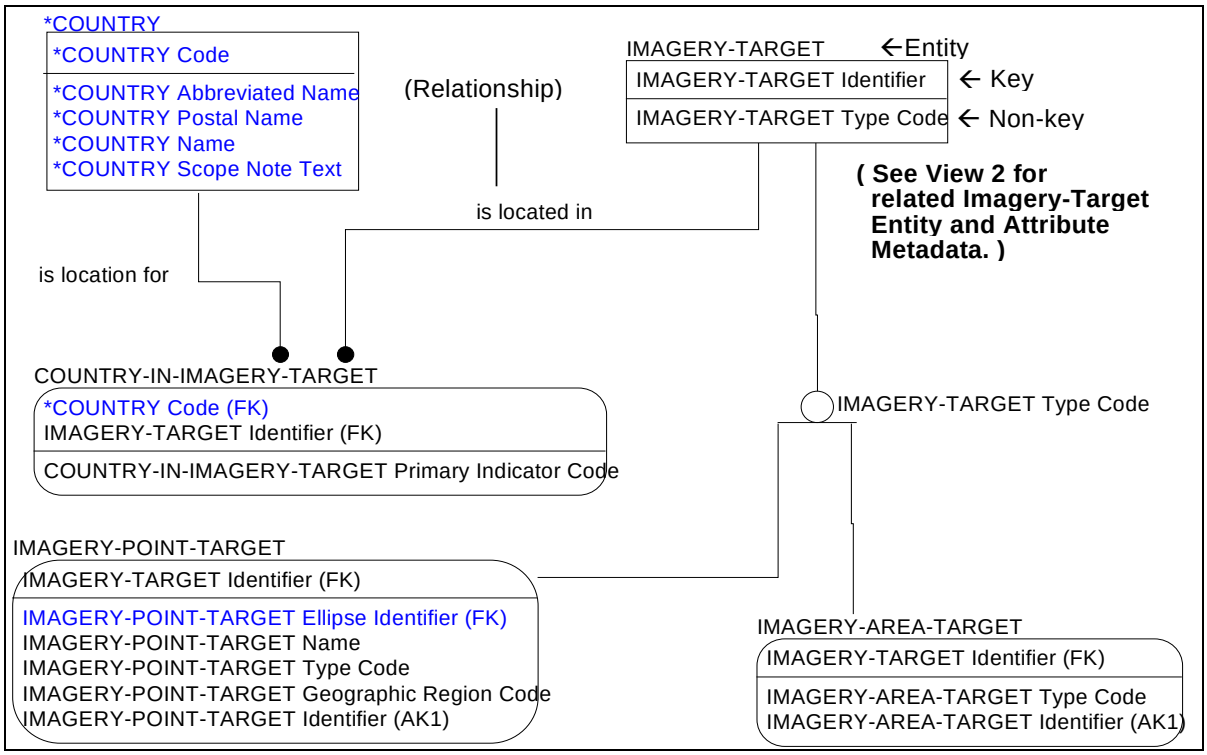
The DDDS supports only unclassified processing. To provide repository services for classified or sensitive data elements, ASD/C3I developed the Secure Intelligence Data Repository (SIDR). The SIDR will include the unclassified data models and data elements from the DDDS and will add models and elements which are classified.

The USIGS Conceptual Data Model consists of appropriate extracts of both DDDS and SIDR necessary for coordination with the communities beyond the USIGS. Since the entire data requirements of NIMA and USIGS will go beyond the geospatial, imagery, and imagery intelligence domains, other data models and definitions are referenced beyond those that are NIMA responsibility. The UCDM is described in a the USIGS Conceptual Data Model Report, as illustrated in Table 5-1.

Table 5-1 USIGS Conceptual Data Model Report Contents

Volume	Title	Models
Volume I	Metadata	Data Set Quality Security and Restrictions Geometry Topology Georeference Feature and Attribute Representation
Volume II	Imagery	Image Sensor Platform Imagery Target
Volume III	Air Transportation	Air Routes Model Airspace Model Aeronautical Navigation Aids Model Airport Model Terminal Procedures Model
Volume IV	Ground Transportation	Railroad Model Road Model Tunnels, Bridges, and Parking Areas Model
Volume V	Water Transportation	Hydrographic Aids to Navigation Model Maritime Hazards Model Maritime Routes Model Port and Harbor Model
Volume VI	Water Features	Inland Water Model Shore and Shoreline Model
Volume VII	Cultural Features	Power Generation Model Mineral Extraction Model
Volume VIII	Phyisography	Snow and Ice Rock Formation Exposed Surface Materials Vegetation

1st View



2nd View

Example of Imagery-Target Metadata from the USIGS Data Model

Entity Name: Imagery-Target
Entity Definition: A target which an imagery action may be taken.
Functional Area Identifier: 034
DDDS PW Counter: 12363
Submission Type: Developmental
Owned by Model Name: Imagery Model

Attribute Name: Imagery-Target Identifier
Attribute Definition: The identifier of a particular Imagery-Target.
Status: Unsubmitted
Unit Measure Name: NA
High Range Identifier: NA
Decimal Place Count Quantity: NA
Data Type Name: Character-String
Maximum Character Count Quantity: 15
Low Range Identifier: NA

Attribute Name: Imagery-Target Type Code
Attribute Definition: A code that indicates the type of Imagery-Target.
Status: Unsubmitted
Unit Measure Name: NA
High Range Identifier: NA
Decimal Place Count Quantity: NA
Data Type Name: Character-String
Maximum Character Count Quantity: 1
Low Range Identifier: NA

Figure 5-2 USIGS Conceptual Data Model Excerpts (sample)

Table 5-2 USIGS Conceptual Data Model

Name: USIGS Conceptual Data Model
Description and Purpose of Product: The USIGS Conceptual Data Model defines and depicts the conceptual relationship of all USIGS data. The model is divided into views, each functionally relevant. In combination they reflect the overall USIGS enterprise.
Audience: USIGS mid-level managers, program managers, system architects, system developers, system operators; imagery and mapping users and consumers within the Department of Defense and the Intelligence Community (e.g., Services, Service Intelligence Centers, Unified Command Joint Intelligence Centers, theater and tactical intelligence units, Combat Support Agencies, and other National Agencies and Offices); NIMA DO, ST, CA
Creator/Maintainer: NIMA ST/ARU
Format: Multiple graphics in IDEF1X modeling notation, with text data dictionary report (these are linked in the softcopy version)
Applicable Tools: ERWIN, ERWIN Viewer, DDDS, SIDR, MS-Access, PCAT, CUDA, Adobe Acrobat
Dependent On: DoD Directive 8320.1, USIGS Operational Architecture, USIGS Technical Architecture
fluenced: Planning Process - Guidance Requirements Process - Mandatory Resource Management - Guidance Acquisition Process - Mandatory Community Interaction - Dependent
Revision Cycle: Continual development; revisions issued quarterly
Controlling Authority: NCCB
Classification: UNCLASSIFIED, SECRET, and/or SENSITIVE COMPARTMENTED INFORMATION (as appropriate, based on content)

5.4 USIGS Conceptual Data Model Product Linkages

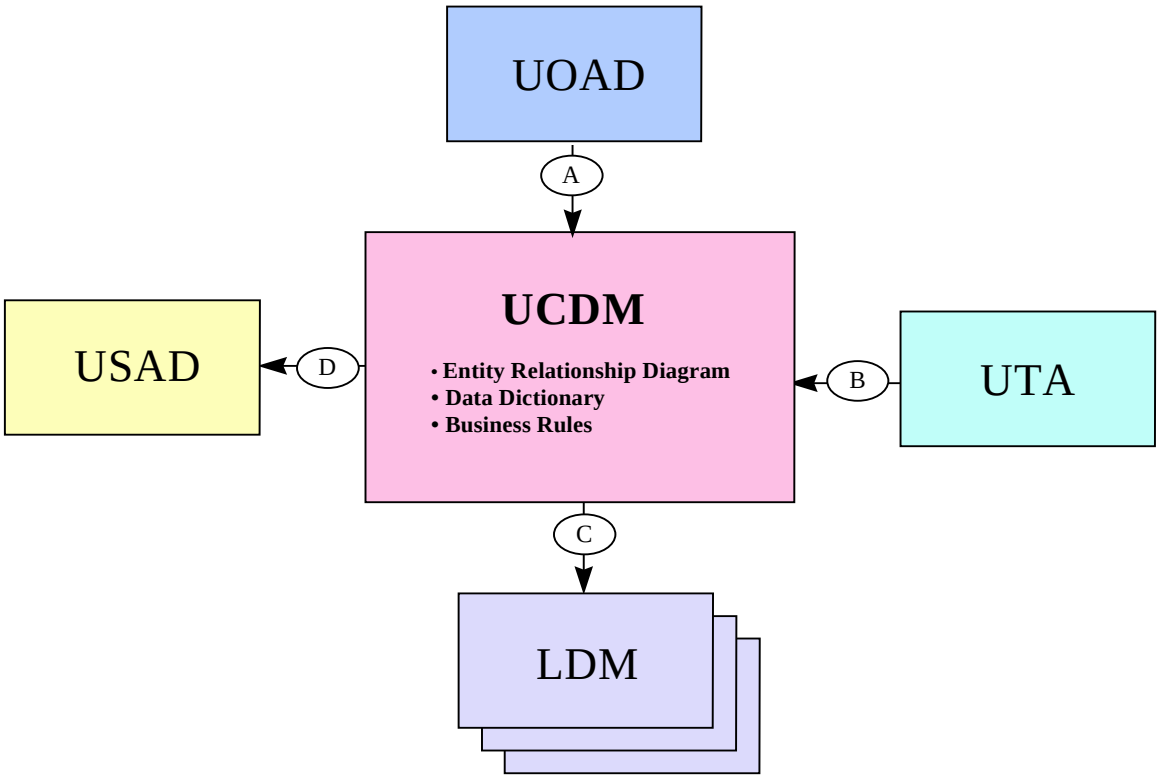


Figure 5-3 USIGS Conceptual Data Model Product Linkages

A: The UOAD identifies the operational elements and information needs to the UCDM.

B: The technical architecture defines the standards for data modeling and data standardization.

C: The UCDM defines the combined information requirements for the community. LDMs must conform fully to the UCDM. LDMs may feed back new data requirements to the UCDM.

D: The UCDM defines the data elements for system architecture data stores.

Section 6
USIGS MIGRATION PLAN

6.1 Description

USIGS migration products outlined in this section support the evolution of multiple imagery and geospatial systems into an integrated USIGS. The primary emphasis of migration is to develop a dynamic system that will provide immediate response to diverse customer needs. Key evolution elements are:

- Provide seamless access to tailorable imagery, imagery intelligence, and geospatial information
  - USIGS Information Service
- Make information available on very short timelines at lowest possible classification level
- Use best available information and technology
  - Align information technology with industry direction
  - More and better use of commercial imagery
- Prepare for future imagery collectors
- Eliminate functional duplication
- Reuse components
- Promote interoperability and compatibility
- Save time and money

In order to fulfill these objectives, the USIGS migration must encompass more than a traditional replacement of older systems and capabilities with newer ones. It must evolve today's individual imagery and geospatial system capabilities into an *integrated system*—USIGS, defined by common services and customer-derived mission applications.

6.2 Major Influences

Migration planning products are the road map that will enable NIMA to move away from today's standalone capabilities to the USIGS envisioned in the *IGC Operations Vision*, the NIMA *Operations Directorate Vision*, and the USIGS "To-Be" Systems Architecture. The major influences on migration planning are:

- Deputy Secretary of Defense/Director of Central Intelligence Joint Intelligence Guidance and Fiscal Guidance
- *Joint Technical Architecture* (JTA)
- NIMA Business Plan
- NIMA *Operational Directorate Vision*
- *IGC Operations Vision*
- USIGS Operational Architecture Description
- USIGS Technical Architecture
- USIGS System Architecture Description
- USIGS Conceptual Data Model
- Industry and Technical Direction
- Critical Drivers (e.g., Y2K, EIS, FIA, CIGSS, DCGS)

6.3 Migration Process

Migration will be achieved through an iterative process of analysis, definition and reengineering that will drive the evolution of the USIGS architecture from the "As-Is" state, defined by current system operating capabilities, to the "To-Be" state defined by the USIGS System and Operational Architectures.

It will replace monolithic system designs with USIGS interoperable software applications packaged to meet user-defined mission needs (Figure 6-1). The migration process reduces system redundancies and moves USIGS towards the ability to provide users with seamless access to data. As a part of the process, existing systems are decomposed into functional requirements that are then bundled into USIGS elements. USIGS Elements consist of mission specific applications operating on a common infrastructure which provides all required common support services, communications, and computing platforms.

The migration process is marked by the continuous integration of additional capabilities into the baseline. Effectivities define the functional capabilities that will be stood up to meet defined evolutionary requirements within a specified period of time. They are described in terms of their impact on current operating capabilities within each of the USIGS program elements. Early USIGS capabilities will focus on the implementation of standard data access and elimination of redundant data catalogs and information stores. Establishment of this initial USIGS capability will provide an interoperable environment for softcopy imagery and geospatial workstations. The UAF migration products provide the tools for effecting the analysis, definition, and integration processes that will continually feed new capabilities into USIGS.

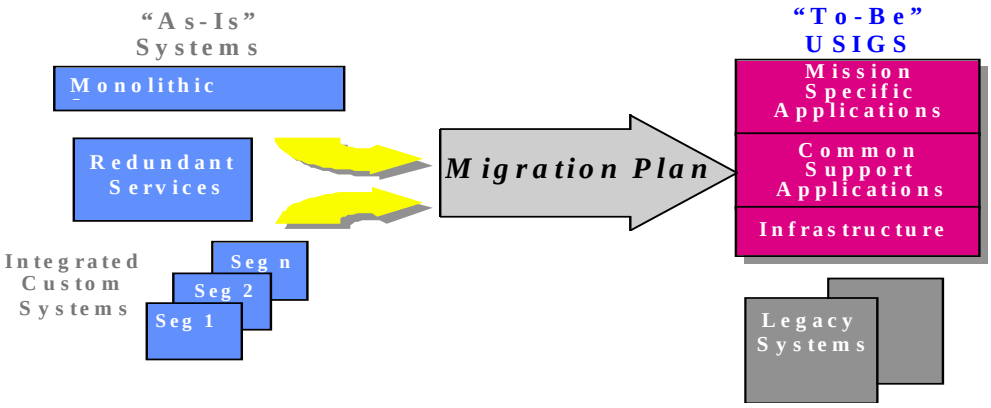


Figure 6-1 USIGS Migration

6.4 USIGS Migration Products

The USIGS migration products are:

- USIGS Evolutionary Phased Implementation Plan (EPIP)
- Functional Manager's Guidance for the Imagery and Geospatial Community Input Form

6.4.1 USIGS Evolutionary Phase Implementation Plan (EPIP)

Central to the evolution of an integrated USIGS, is the development of an iterative document that captures those planned migrations of each fiscal year. The USIGS EPIP provides basic guidance and establishes the path for the evolution of USIGS. The EPIP is designed to facilitate the transition from a closed, proprietary information architecture into an open architecture, that leverages commercial off the shelf (COTS) products to facilitate standards-based information exchange. This allows for more rapid insertion of new technologies that produce a more flexible architecture with increased performance capabilities.

The primary purpose of the EPIP is to document and gain agreement on a solid, executable migration plan. It provides information to support both POM and IPOM builds. It also provides the information needed to defend budget items related to migration. The EPIP defines high-level migration plans for the next five years and defines a detailed executable plan for the next 2 years. Figure 6-2 depicts the coverage of each EPIP. The EPIP will receive a major revision annually. There will be a minor revision at mid-cycle, which will focus on updating the detailed two-year plan.

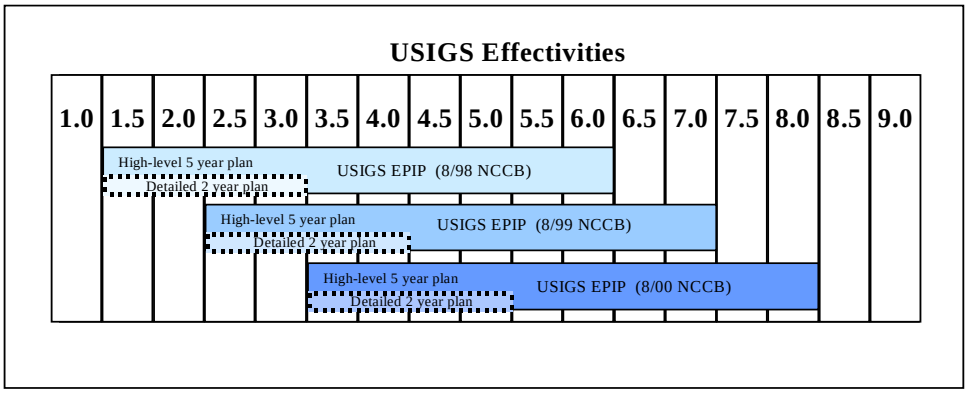


Figure 6-2 Annual Coverage of USIGS EPIP

The USIGS Evolution Diagram describes the migration steps identified in the EPIP. It is functionally based and depicts the integration of current system functions into the USIGS through multiple effectivities (or migration cycles). Evolution diagrams may be used in the EPIP as an aid to illustrate the plan. An example is provided in Figure 6-3.

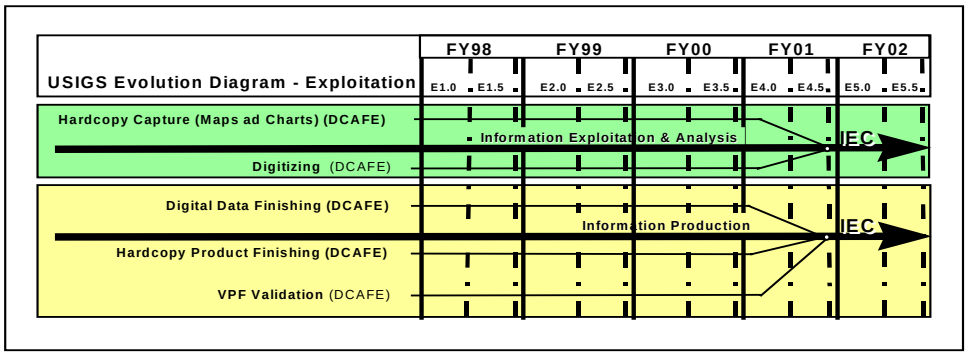


Figure 6-3 USIGS Evolution Diagram (sample)

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Figure 6-4 USIGS Evolutionary Phase Implementation Plan (sample)

Table 6-1 USIGS Evolutionary Phase Implementation Plan

Name: USIGS Evolutionary Phase Implementation Plan (EPIP)
Description and Purpose of Documentation: The USIGS EPIP documents the evolution of the USIGS "to-Be" Architecture from the "As-Is" Architecture and describes the incorporation of multiple system capabilities into the emerging USIGS. The EPIP bundles functions into effectivities and allocates them to a program element. It identifies deliveries of function for NIMA sites and external sites. It provides an executable migration plan that will be implemented by the PEOs.
Audience: USIGS senior and mid-level managers, resource managers, program managers, system architects, NIMA DO, CA, ST
Creator/Maintainer: NIMA ST/SE
Format: Text document with annotated graphics
Applicable Tools: Major milestones and related capabilities from the EPIP can extend into DOORS to be linked to the acquisition and development efforts, and to show where dependencies exist between efforts. Word processor and scheduling tools are also utilized.
Dependencies:, USIGS Operational Architecture, USIGS Technical Architecture, USIGS System Architecture, USIGS Conceptual Data Model
Processes Influenced: Planning Process – Mandatory Requirements Process – Mandatory Resource Management – Mandatory Acquisition Process – Mandatory Community Interaction - Dependent
Revision Cycle: Major revision annually; minor revision at mid-cycle
Controlling Authority: NCCB

Classification: Unclassified

6.4.2 Functional Manager's Guidance for the Imagery and Geospatial Community Input Form

Functional Manager's Guidance for the Imagery and Geospatial Community Input Form

Individual Functional Manager's Guidance items will be developed by appropriate NIMA OPRs in accordance with annual tasking from NIMA/CF. Internal guidance inputs will be submitted through the NIMA Integration Board (NIB). External guidance inputs will be submitted through the Imagery and Geospatial Community Senior Steering Group (processes TBD).

NIMA OPRs will provide their guidance items to NIMA/CF in one (per Business Unit) coordinated and approved list of guidance items, through their management chain. Individual guidance items will be provided in a short paragraph format that contains each of the following components:

WHO: NIMA, CIA, DIA, DISA, NRO, DARO, The Services, The Service Centers, The Unified Commands, The JICs/JAC, The Theater and Tactical units, and/or Development Offices, etc. (as appropriate)

WILL DO WHAT:

Either:

A. Program $_____million of Research and Development (R&D), $_____million of Procurement, $_____million of Military Pay, $_____million of Military Construction and/or $_____million of Operations and Maintenance (O&M) funds, etc. (as appropriate)

Or:

B. Submit an initiative to program $_____million of Research and Development (R&D), $_____million of Procurement, $_____million of Military Pay, $_____million of Military Construction and/or $_____million of Operations and Maintenance (O&M) funds, etc. (as appropriate)

FOR WHAT PURPOSE: To design, develop, field, implement, man, operate and/or maintain, _____ system, application, communications bandwidth, capability, organization, unit, etc. (as appropriate)

IN WHAT YEAR (S): In FY2000, 2001, 2002, 2003, 2004, 2005, or any appropriate combination of years (i.e.: 2000-2001, 2000-2005, etc.), (as appropriate)*

IN WHAT DOCUMENT: FY2000-2005 Intelligence Program Objectives Memorandum (IPOM) submission

IN RESPONSE TO WHICH NIMA OPR: Mr./Ms. ____ _____, NIMA/____, phone_____

EXAMPLES:

A. NIMA will program $500K/year/Command of O&M funds to support the implementation of CILs at EUCOM, ACOM and PACOM in FY2000 and 2001 in the FY2000-2005 NIMAP IPOM submission. Continuing O&M funding beyond the first two years of CIL operation will be the responsibility of the operating Commands. OPR: Ms. ____ _____, NIMA/SE, (___) ___-_____

B. EUCOM, PACOM and ACOM will submit initiatives to the GDIP Program Manager to program $500K/year/ Command of O&M funds to support the recurring maintenance of CILs at EUCOM, ACOM and PACOM in FY2002 through 2005 in the FY2000-2005 GDIP IPOM submission. OPR: Ms. ____ _____, NIMA/SE, (___) ___-_____

***NOTES:** For development projects, funding must be programmed through Final Operational Capability (FOC) plus one year, even if that year is beyond the current Future Years Defense Program (FYDP), (e.g., FY02-FY10, etc.)

Figure 6-5 Functional Manager's Guidance for the Imagery and Geospatial Community Input Form (sample)

Table 6-2 Functional Manager's Guidance for the Imagery and Geospatial Community Input Form

Name: Functional Manager's Guidance for the Imagery and Geospatial Community Input Form
Description and Purpose of Product: This input format is used to develop the annual Functional Manager's Guidance for the IGC which provides programming and budgeting guidance for the annual Intelligence Program Objectives Memorandum (IPOM) program build. Functional Manager's Guidance is applicable to all imagery and mapping organizations, programs, systems, applications and support infrastructure and communications funded in the National Foreign Intelligence Program (NFIP), the Joint Military Intelligence Program (JMIP) and the Tactical Intelligence and Related Activities (TIARA) aggregation.
Audience: Imagery and mapping developers, collectors, producers, users and consumers within the Department of Defense and the Intelligence Community (e.g., the Services, Service Intelligence Centers, Unified Command Joint Intelligence Centers, theater operational and tactical intelligence units, Combat Support Agencies such as NIMA, and National Agencies and Offices such as CIA, NRO, DARO, etc.); NIMA DO, CA, ST
Creator/Maintainer: NIMA CA/CF, ST/ARE
Format: Single or multiple page(s)
Applicable Tools: Word processor
Dependent On: Deputy Secretary of Defense/Director of Central Intelligence Joint Intelligence Guidance and Fiscal Guidance
Processes Influenced: Planning Process - Mandatory Requirements Process - Guidance Resource Management - Mandatory Acquisition Process - Mandatory Community Interaction - Dependent
Revision Cycle: Annual, developed July – December
Controlling Authority: Director, NIMA
Classification: UNCLASSIFIED, SECRET, and/or SENSITIVE COMPARTMENTED INFORMATION (as appropriate, based on content)

6.5 Migration Planning Product Linkages with USIGS Architecture Products and Enterprise Planning Products

The migration planning products draw from the USIGS architecture products as their primary sources. Figure 6-6 portrays the migration planning product linkages.

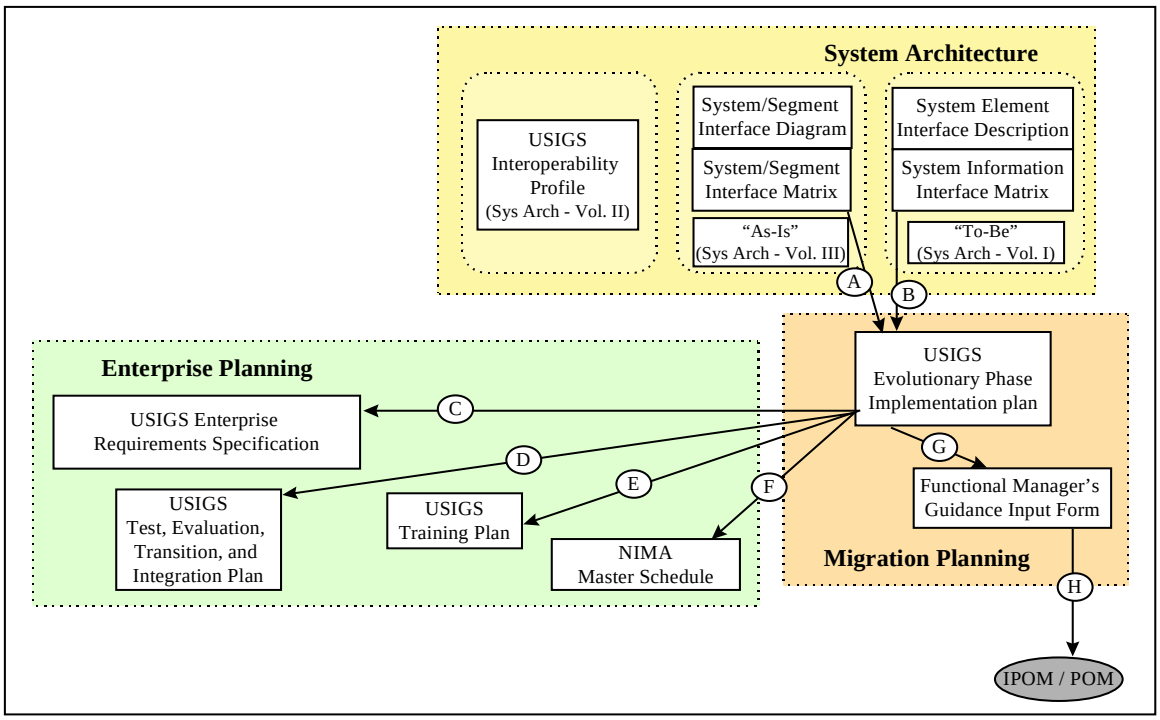

Figure 6-6 Migration Planning Product Linkages

The linkages that exist with the Migration Planning Products are explained as follows:

A. The As-Is System Architecture provides the USIGS EPIP with definition of the current baseline from which migration occurs, existing systems/segments that comprise the baseline, and existing interfaces.

B. The To-Be System Architecture provides the USIGS EPIP with the definition of the goal architecture for USIGS migration a well as planned relationships among architectural products and components.

C. The USIGS EPIP provides the USIGS Enterprise Requirements Specification with a high-level plan for migration of major functionality by effectivity; detailed functionality binned by effectivity and program element.

D. The USIGS EPIP provides the USIGS Test, Evaluation, Integration and Transition Plan with the definition of effectivities and any changes to the test, evaluation, integration, and transition strategies driven by the migration planning.

E. The USIGS EPIP provides the USIGS Training Plan with the definition of effectivities and any changes to training strategy driven by the migration planning.

F. The USIGS EPIP provides the NIMA Master Schedule with dates of the effectivities.

G. The USIGS Migration Plan provides the Functional Manager's Guide with the plan for migration for the following IPOM/POM cycle.

H. The Functional Manager's Guide provides programming and budgeting guidance to the IPOM and POM.

Section 7

USIGS ARCHITECTURE COMPLIANCE

7.1 Description

The USIGS Architecture establishes a set of requirements and guidelines that must be followed when acquiring new capabilities or modifying existing capabilities. Compliance with these requirements and guidelines, as defined in the USIGS Operational Architecture, USIGS System Architecture, USIGS Technical Architecture, and USIGS Conceptual Data Model, will result in an integrated, interoperable system, with minimal redundant functionality that supports the sharing of data, services and resources among the IGC. A USIGS Architecture Compliance Checklist is provided as Appendix IV.

7.2 Major Influences

The USIGS architecture products and migration products drive the remaining USIGS documents either directly or indirectly. Figure 7-1 depicts these document linkages, while Table 7-1 provides descriptions of the Enterprise Planning and Program Element documents depicted in Figure 7-1.

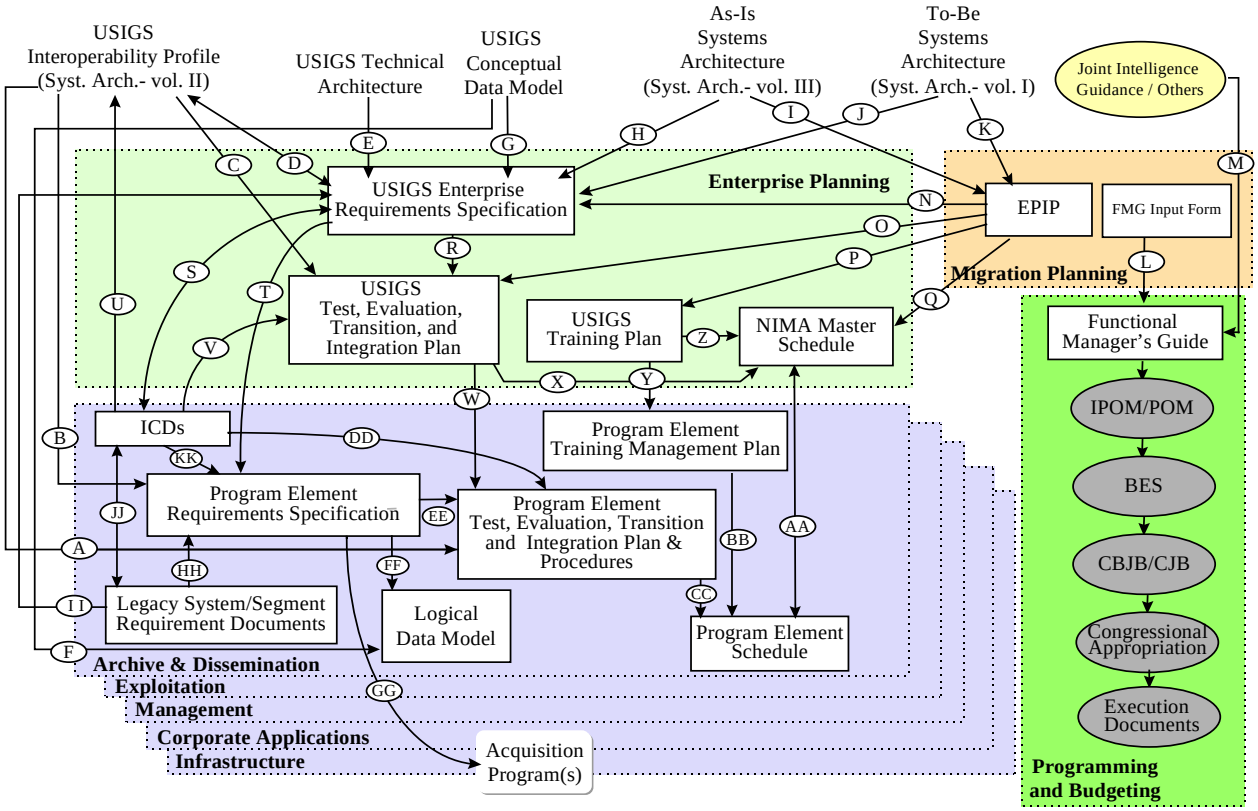

Figure 7-1 USIGS Architecture and Migration Planning Product Linkages to Enterprise Planning and Program Element-Level Documents

The linkages identified in Figure 7-1 are explained as follows:

A. The USIGS Interoperability Profile provides the Program Element Test, Evaluation, Transition, and Integration Plan and Procedures with interface requirements that require verification.

B. The USIGS Interoperability Profile provides the Program Element Requirements Specification with the profile for interface standards, application program interfaces for OGE services, and communication protocols.

C. The USIGS Interoperability Profile provides the USIGS Test, Evaluation, Transition, and Integration Plan with interface requirements that require verification.

D. The USIGS Interoperability Profile/Application Program Interface Specifications/USIGS Common Object Specification provides the USIGS Enterprise Requirements Specification with the profile for interface standards, application program interfaces for OGE services, and communication protocols. The USIGS Enterprise Requirements Specification provides the USIGS Interoperability Profile/Application Program Interface Specifications/USIGS Common Object Specification with requirement changes that impact interfaces.

E. The USIGS Technical Architecture provides the USIGS Enterprise Requirements Specification with the USIGS profile for the JTA, USIGS Standards and Specifications, Conventions, Guidelines, MSAs, CSAs, OGEs, Common Facilities, and Platform Services.

F. The USIGS Conceptual Data Model provides the Logical Data Models with the data structures, definitions, and relationships of all USIGS data types, data names, and data characteristics.

G. The USIGS Conceptual Data Model provides the USIGS Enterprise Requirements Specification with the data structures, definitions, and relationships of all USIGS data types, data names, and data characteristics.

H. The As-Is Systems Architecture provides the USIGS Enterprise Requirements Specification with the current baseline from which migration occurs, it identifies existing systems/segments and functionality that comprise the baselines, and it identifies existing interfaces.

I. The "As-Is" Systems Architecture provides the system baseline for establishing migration of USIGS functionalities defined within the EPIP.

J. The To-Be Systems Architecture provides the USIGS Enterprise Requirements Specification with the definition of the goal of USIGS migration; it defines planned relationships between components, functionality and data.

K. The "To-Be" Systems Architecture provides the target architecture that provides the build-to functional requirements that define USIGS Effectivities within the EPIP.

L. The Functional Manager's Guidance Input Forms provide a standard template for developing and providing inputs to the Director, for inclusion in NIMA's *Functional Manager's Guidance for the Imagery and Geospatial Community*.

M. The Director of Central Intelligence and Deputy Secretary of Defense's Joint Intelligence Guidance, and other like guidance external to NIMA, provide Intelligence Community and Department of Defense-wide guidance that establishes the overarching framework for NIMA's *Functional Manager's Guidance for the Imagery and Geospatial Community.*

N. The USIGS EPIP provides the USIGS Enterprise Requirements Specification with a high-level plan for migration of major functionality by effectivity; detailed functionality binned by effectivity and program element.

O. The USIGS EPIP provides the USIGS Test, Evaluation, Integration and Transition Plan with the definition of effectivities and any changes to the test, evaluation, integration, and transition strategies driven by the migration planning.

P. The USIGS EPIP provides the USIGS Training Plan with the definition of effectivities and any changes to training strategy driven by the migration planning.

Q. The USIGS EPIP provides the NIMA Master Schedule with dates of the effectivities.

R. The USIGS Enterprise Requirements Specification provides the USIGS Test, Evaluation, Transition, and Integration Plan with enterprise level requirements and associated verification methods (i.e., test, demo, analysis, or inspection).

S. The USIGS Enterprise Requirements Specification provides the ICDs with requirements changes that affect existing interfaces. The ICDs provide the USIGS Requirements Specification with the detailed definitions of existing interfaces.

T. The USIGS Enterprise Requirements Specification provides the Program Element Requirements Specifications with enterprise-level requirements allocated to program elements.

U. The ICDs provide the USIGS Interoperability Profile with the definition of existing interfaces.

V. The ICDs provide the USIGS Test, Evaluation, Transition, and Integration Plan with interface requirements that require verification.

W. The USIGS Test, Evaluation, Transition, and Integration Plan (TETIP) provides the Program Element Test, Evaluation, Transition, and Integration Plan and Procedures with the overall structure and objectives of USIGS TETIP activities.

X. The USIGS Test, Evaluation, Transition, and Integration Plan provides the NIMA Master Schedule with test, evaluation, transition, and integration activities, milestones, and dependencies.

Y. The USIGS Training Plan provides the Program Element Training Management Plan with high level training plans by effectivity.

Z. The USIGS Training Plan provides the NIMA Master Schedule with training activities and dependencies.

AA. The Program Element Schedule provides the NIMA Master Schedule with program element-level and acquisition activities, milestones, and dependencies. The NIMA Master Schedule provides the Program Element Schedule with enterprise-level activities, milestones, dependencies, and constraints.

BB. The Program Element Training Management Plan provides the Program Element Schedule with training activities and dependencies, including training coordination with users and planned updates of the Program Element Training Management Plan.

CC. The Program Element, Test, Evaluation, Transition, and Integration Plan and Procedures provides the Program Element Schedule with program element test, evaluation, transition, and integration activities, milestones, and dependencies.

DD. The ICDs provide the Program Element Test, Evaluation, Transition, and Integration Plans and Procedures with interface requirements that require verification.

EE. The Program Element Requirements Specification provides the Program Element Test, Evaluation, Transition, and Integration Plan and Procedures with program element requirements and associated verification methods (i.e., test, demo, analysis, or inspection) and verification phases (e.g., FAT or SAT).

FF. The Program Element Requirements Specification provides the Logical Data Model with data requirements.

GG. The Program Element Requirements Specification provides acquisition program with program requirements.

HH. The Existing System/Segment Requirements Documents provide the Program Element Requirements Specification with existing functional and performance requirements.

I I. The Legacy System/Segment Requirements Documents provide the USIGS Enterprise Requirements Specification with existing functional and performance requirements.

JJ. The ICDs provide the Legacy System/Segment Requirements Documents with the definition of existing interfaces. The Legacy System/Segment Requirements Documents provide the ICDs with requirement changes that impact existing interfaces.

KK. The ICDs provide the Program Element Requirements Specifications with the definition of existing interfaces.

Table 7-1 Descriptions of Enterprise Planning and Program Element-Level Documents

Document Type	Document Title	Document Description
Enterprise Planning Documents	USIGS Enterprise Requirements Specification (UERS)	High level USIGS functional, performance, communication, security, and verification requirements allocated to effectivities and to USIGS program elements
	USIGS Test, Evaluation, Transition, and Integration Plan (TETIP)	Supports test, evaluation, transition, and integration of enterprise requirements and interface requirements (internal and external). Documents overall structure and objectives of test, evaluation, transition, and integration, including: ▪ Responsibilities ▪ Resources ▪ Informal data exchanges ▪ Developmental tests and demonstrations ▪ Integration tests and demonstrations ▪ DII COE compliance testing ▪ Operational tests and evaluations ▪ Production start-up and operational ramp-up ▪ Facilities plans
	USIGS Training Plan	Provides description of USIGS-level (i.e., system of systems) training as well as summary descriptions of training plans by effectivity for each new or upgraded capability, including descriptions of: ▪ Training audience – Organization – Function (e.g., imagery analyst, database administrator) ▪ Location of training ▪ Concepts for training development and delivery
	NIMA Master Schedule	Identifies USIGS critical milestones, activities, and dependencies
Program Element Documents	Program Element Requirement Specification	Defines functional, performance, communication, security, design, and verification requirements for a USIGS program element in sufficient detail for an acquisition program. ▪ Minimizes redundant functionality within the program element ▪ Allocates program element requirements to MSAs, CSAs, OGEs, Common Facilities, and Platform Services

Document Type	Document Title	Document Description
	Program Element Test, Evaluation, Transition, and Integration Plan & Procedures	Provides detailed plan and procedures for test, evaluation, transition, and integration activities. Establishes activities that integrate program deliveries into the USIGS operational environment. Provides plans and procedures for: ▪ Informal data exchanges ▪ Developmental tests and evaluations ▪ Informal integration tests/demos and formal integration tests/demos between acquisition programs/MSAs within a single program element ▪ DII COE compliance tests ▪ Operational tests and evaluations ▪ Production start-up ▪ Facilities plans
	Program Element Training Management Plan	Expanded detail of training plan based on details of acquisition. Includes: ▪ Summary ops concept (e.g., where system is deployed, who are the users, estimated number of users) ▪ Intended training audience (i.e., organizational level and functional positions) ▪ Course names, descriptions, lengths, and pre-requisites ▪ Training concept (i.e., EPSS, train the trainer, factory training) ▪ Resources (e.g., number of workstations needed to support training) ▪ Estimate of training cost and associated assumptions ▪ Plans for conducting training with the community
	Program Element Schedule	Identifies deliveries, activity windows, milestones, and dependencies for all program element activities and acquisition activities.
	Logical Data Model	Provides implementation details of conceptual model to meet specific system and functional information requirements.
	Legacy System/Segment Requirements Document	Defines functional, performance, and verification requirements for legacy systems and segments.
	Interface Control Document (ICD)	Provides detailed definition of existing interfaces.

APPENDIX I

Acronym List

ACOM	United States Atlantic Command
ACR	American College of Radiology
ACTD	Advanced Concept Technology Demonstration
ADDS	Aeronautical Digital Data System
AFMSS	Air Force Mission Support System
AIG	Air Intelligence Group
ALE	AIRES Lifecycle Extension
ANSI	American National Standards Institute
API	Application Program Interface
AR	Architecture and Requirements Office, NIMA
ARC	Arc Raster Chart
ARE	Enterprise Engineering Division, NIMA
ARA	Airborne Reconnaissance Architecture
ARU	USIGS Architecture Division, NIMA
ASAS	All Source Analysis System (USA)
ASD (C3I)	Assistant Secretary of Defense (Command, Control, Communication, and Intelligence)
ATARS	Advanced Tactical Air Reconnaissance System
ATF	Amphibious Task Force
BDE	Brigade
BIIF	Basic Image Interchange Format
BN	Battalion
C4I	Command, Control, Communications, Computers and Intelligence
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CA	Directorate of Corporate Affairs, NIMA
CADRG	Compressed ARC Digitized Raster Graphic
CARS	Contingency Airborne Reconnaissance System
CATIS	Computer-Aided Tactical Information System
CF	Imagery and Geospatial Community Management Office, NIMA

CGM	Computer Graphics Metafile
CIA	Central Intelligence Agency
CIL	Command Information Library
CINC	Commander-in-Chief
CIS	Combat Intelligence System (USAF)
CISA	C4I Integration Support Activity
COE	Common Operating Environment
CORBA	Common Object Request Broker Architecture
CSPE	Client/Server Processing Environment
CTAPS	Contingency Theater Automated Planning System (USAF)
CVBG	Aircraft Carrier Battle Group
CVIC	Aircraft Carrier Intelligence Center
DAGS	Data Architecture and Gateway Services
DARO	Defense Airborne Reconnaissance Office
DDDS	Defense Data Dictionary System
DIA	Defense Intelligence Agency
DICOM	Digital Imagery and Communications in Medicine
DII COE	Defense Information Infrastructure Common Operating Environment
DISA	Defense Information Systems Agency
DISN	Defense Information Systems Network
DIV	Division
DMB	DoDIIS Management Board
DO	Directorate of Operations, NIMA
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDIIS	Department of Defense Intelligence Information System
DoDJP	Department of Defense Joint Publication
DPS	Digital Production System
EFCS	Electronic Filmless Camera System
EPIP	Evolutionary Phase Implementation Plan
EPS	Enhanced Production System
EPS	Encapsulated PostScript

EPSF Encapsulated PostScript File

EPSI Encapsulated PostScript Interchange

ESS Exploitation Support System

ETRAC Enhanced Tactical Radar Correlator

EUCOM United States European Command

FACC Feature and Attribute Coding Catalog

FIA Future Imagery Architecture

FIIU Fleet Imagery Interpretation Unit (USMC)

FITS Flexible Image Transport System

FLIS Federal Logistics Information System

FOC Full Operational Capability

FTP File Transfer Protocol

FYDP Future Years Defense Program

GBS Global Broadcast Service

GDIP General Defense Intelligence Program

GIAS Geospatial and Imagery Access Services

GII Geospatial Information Infrastructure

GIIPT Geospatial Information Integrated Product Team

GIS Geographic Information System

GNPS Geographic Names Processing System

GSMC Geospatial Standards Management Committee

GSS Generic Security Service

HAE High Altitude Endurance

HYSAS Hydrographic Source Assessment System

I&RTS Integration Runtime Specification

IA Imagery Analyst

IAS Intelligence Analysis System (USMC)

IC Intelligence Community

ID Identification

IDEX II Imagery Digital Exploitation System II

IER Information Exchange Requirement

IES IDEX II Imagery Exploitation Station

IESS	Imagery Exploitation Support System
IGC	Imagery & Geospatial Community
IPL	Image Product Library
IPOM	Intelligence Program Objectives Memorandum
IPT	Image Perspective Transformation
ISB	Intelligence Systems Board
ISMC	Imagery Standards Management Committee
ISO	International Standards Organization
ISS	Intelligence Systems Secretariat
JAC	Joint Analysis Center (EUCOM)
JBS	Joint Broadcast Service
JCMT	Joint Collection Management Tool
JDISS	Joint Deployable Intelligence Support System
JFACC	Joint Force Air Component Commander
JFLCC	Joint Force Land Component Commander
JFMCC	Joint Force Maritime Component Commander
JIC	Joint Intelligence Center
JIMC	Joint Information Management Center
JIVA	Joint Intelligence Virtual Architecture
JMCIS	Joint Maritime Command Information System
JMIP	Joint Military Intelligence Program
JRC	Joint Reconnaissance Center
JSIPS	Joint Service Imagery Processing System
JSIPS-N	Joint Service Imagery Processing System - Navy
JSOTFC	Joint Special Operations Task Force Commander
JTA	Joint Technical Architecture (DoD)
JTF	Joint Task Force
LO	Low Observable
LPH	Landing Platform Helicopter (USN)
MAE	Medium Altitude Endurance
MAG	Marine Air Group (USMC)
MAU	Marine Amphibious Unit (USMC)

MCG&I	Mapping, Charting, Geodesy and Imagery
MEDICOM	Medical Digital Imaging and Communications
MI	Military Intelligence
MIES	Modernized Imagery Exploitation System
MIGS	Multi-Intelligence Ground System (USAF, CARS + JSIPS)
MIL STD	Military Standard
MNS	Mission Need Statement
MTS	Man Transportable SOCRATES
NCCB	NIMA Configuration Control Board
NDS	NIMA Data System
NEMA	National Electrical Manufacturers Association
NES	NIMA Exploitation System
NFIP	National Foreign Intelligence Program
NIB	NIMA Integration Board
NIL	National Information Library
NIMA	National Imagery and Mapping Agency
NIMAP	National Imagery and Mapping Agency Program
NIPRNET	Non-Secure Internet Protocol Router Network
NIST	National Intelligence Support Team
NITF	National Imagery Transmission Format
NITFS	National Imagery Transmission Format Standard
NMJIC	National Military Joint Intelligence Center
NRO	National Reconnaissance Office
NSS	Navigation Safety System
O&M	Operations and Maintenance
ORD	Operational Requirements Document
OMA	Object Management Architecture
OMG	Object Management Group
OS	Operating System
OSI	Open Systems Interconnection
PAS	Studies and Analysis Division, NIMA
PACOM	United States Pacific Command

PC	Personal Computer
PCAT	Personal Computer Access Tool
POM	Program Objective Memorandum
R&D	Research and Development
RAID	Redundant Array of Independent Disks
REGT	Regiment
RMS	Requirements Management System
SCI	Sensitive Compartmented Information
SHADE	Shared Data Environment (DII component)
SIDR	Secure Intelligence Data Repository
SIGINT	Signal Intelligence
SOCRATES	SOCOM Research, Analysis & Threat Evaluation System
SOF	Special Operations Forces
SOF IRIS	Special Operations Forces Imagery Receive and Intelligence System
SOF IV	Special Operations Forces Intelligence Vehicle
SOW	Statement of Work
SRIG	Surveillance, Reconnaissance, Intelligence Group
ST	Systems and Technology Directorate, NIMA
TAFIM	Technical Architecture Framework for Information Management
TAMPS	Tactical Aviation Mission Planning System (USN)
TARPS	Tactical Air Reconnaissance Pod System (F14)
TBD	To Be Determined
TBR	To Be Resolved
TES	Tactical Exploitation System (USA)
TIARA	Tactical Intelligence and Related Activities
TTCP	Tailored Technical Criteria Profile
TUAV	Unmanned Aerial Vehicle, Tactical
UAF	USIGS Architecture Framework
UAV	Unmanned Aerial Vehicle
UIP	USIGS Interoperability Profile
USD (A&T)	Under Secretary of Defense (Acquisition & Technology)
USIGS	United States Imagery and Geospatial Information System
UTA	USIGS Technical Architecture

UTAP USIGS Technical Architecture Profile

APPENDIX II
C4ISR ARCHITECTURE FRAMEWORK COMPLIANCE

Applicable Architecture View	C4ISR Architecture Product (C4ISRAF v 2.0)	Essential or Supporting	USIGS Architecture Product (UAF-B)
All Views (Context)	*Overview and Summary Information*	Essential	*USIGS Architecture Framework*
All Views (Terms)	*Integrated Dictionary*	Essential	*USIGS Glossary*
Operational	*High-Level Operational Concept Graphic*	Essential	*Operational Concept Diagram*
Operational	*Operational Node Connectivity Description*	Essential	*TBD*
Operational	*Operational Information Exchange Matrix*	Essential	*Information Exchange Requirements Matrix*
Operational	*Command Relationships Chart*	Supporting	*Operational Relationship Chart*
Operational	*Activity Model*	Supporting	*Activity Hierarchy / Activity Diagram*
Operational	*Operational Rules Model*	Supporting	*None*
Operational	*Operational State Transition Description*	Supporting	*None*
Operational	*Operational Event/Trace Description*	Supporting	*Operational Scenario*
Operational	*Logical Data Model*	Supporting	*USIGS Conceptual Data Model*
Systems	*System Interface Description*	Essential	*USIGS Interoperability Profile / System Element Interface Description (To-Be)*
Systems	*System Communications Description*	Supporting	*TBD*
Systems	*Systems^2 Matrix*	Supporting	*System/Segment Element Interface Diagram (As-Is)*
Systems	*Systems Functionality Description*	Supporting	*System Element Interface Description (To-Be)*
Systems	*Operational Activity to System Function Traceability Matrix*	Supporting	*System Information Exchange Matrix (To-Be)*
Systems	*System Information Exchange Matrix*	Supporting	*System Information Exchange Matrix (To-Be) / System/Segment Interface Matrix (As-Is)*
Systems	*System Performance Parameters Matrix*	Supporting	*System Information Exchange Matrix (To-Be)*
Systems	*System Evolution Description*	Supporting	*Evolutionary Phase Implementation Plan/ Functional Mngrs. Guidance Input Form*
Systems	*System Technology Forecast*	Supporting	*None*
Systems	*System Rules Model*	Supporting	*None*
Systems	*System State Transition Description*	Supporting	*None*
Systems	*System Event/Trace Description*	Supporting	*None*
Systems	*Physical Data Model*	Supporting	*None*
Technical	*Technical Architecture Profile*	Essential	*USIGS Technical Architecture Profile*
Technical	*Standards Technology Forecast*	Supporting	*Standards Technology Forecast*

APPENDIX III
USIGS Glossary Extract

Application Platform: A set of resources, including hardware and software, that support the services on which application software will run. The application platform provides services at its interfaces that, as much as possible, make the specific characteristics of the platform transparent to the application software.

Application Program Interface (API): The interface between the application software and the application platform, across which all services are provided.

Architecture: The structure of components, their relationships, and the principles and guidelines governing their design and evolution over time.

Architecture Description: A representation, as of a current or future point in time, of a defined "domain" in terms of its component parts, what those parts do, how the parts relate to each other, and the rules and constraints under which the parts function.

Architecture Products: Graphical, textual, and tabular items that are developed in the course of building a given architecture description and that describe characteristics pertinent to its purpose. When completed, this set of products constitutes the architecture description.

Common Facilities: Facilities [a collection of services] useful in many application domains and which are made available through OMA- [Object Management Architecture-] compliant class interfaces.

Common Support Application (CSA): A type of Application Software Component that is of use across two or more mission domains (such as logistical command & control, weapon system mission planning/ targeteering, or medical logistics management), and which therefore requires especially careful cross-domain interoperability engineering.

Conceptual Data Model: The relationship and definitions of all data that is used by and influences the other three architecture components - operational, systems, and technical.

Domain: 1) A concept important to interoperability, it is a distinct scope, within which common characteristics are exhibited, common rules observed, and over which a distribution transparency is preserved. 2) A distinct functional area that can be supported by a family of systems with similar requirements and capabilities. An area of common operational and functional requirements.

Essential Products (C4ISR AF): These products constitute the minimal set of products required to develop architectures that can be commonly understood and integrated within and across DoD organizational boundaries and between DoD and multi-national elements. These products must be developed for all architectures.

Expected Level of Interoperability: The projected set of available capabilities two systems exhibit in common.

External Exchanges: Data/information exchanges between systems at the node and systems at other nodes.

Evolution (system): Spreading in scope while increasing functionality and flexibility.

Functional Area: A major area of related activity (e.g., Ballistic Missile Defense, Logistics, or C2 support.)

Functional Requirement: A requirement that specifies a function that a system or system component must be able to perform.

Imagery & Geospatial Community (IGC): The composition of cooperating commands, services, agencies, and departments within the United States government, foreign governments, and private sector organizations involved in the acquisition, production and exploitation, and dissemination of imagery, imagery intelligence, and geospatial information. The IGC fosters extensive partnerships with others, including commercial and academic institutions, to collaboratively work together to share information.

Information Exchange Requirement (IER): A requirement for the context of an information flow. Associated with an IER are such performance attributes as information size, throughput, timelines, quality, and quantity values.

Internal Exchanges: Relevant data/information exchanges between systems within the node.

Mechanism: A physical resource that is involved with the performance of an activity, e.g., personnel, tools, automated systems.

Migration (system): Incrementally creating a more streamlined, efficient, smaller and cheaper suite.

Mission: An objective together with the purpose of the intended action. Note: Multiple tasks accomplish a mission.

Mission Area: The general class to which an operational mission belongs. Note: Within a class, the missions have common objectives.

Mission Specific Application (MSA): A type of Application Software Component that is principally of use in one mission domain. USIGS MSAs are applications that process geospatial and imagery information; each consists of an arrangement of multiple components (OGE Services, Common Facilities and platform services) to perform the specific mission.

Network: 1) The joining of two or more nodes for a specific purpose. 2) A system of connected computers.

Node: A representation of an element of architecture that produces, consumes or processes data.

Open Geospatial Exchange (OGE) Services Application: An Open Geospatial Exchange (OGE) Services Common Support Application, which delivers imagery or geospatial services that are of interest across one or more mission domains (such as logistical command & control, weapon system mission planning/ targeteering, or medical logistics management), and which therefore requires especially careful cross-domain interoperability engineering by NIMA, the agency that is by statute tasked to develop such services.

Operational Architecture: The operational architecture view is a description of the tasks and activities, operational elements, and information flows required to accomplish or support a military operation. It contains descriptions (often graphical) of the operational elements, assigned tasks and activities, and information flows required to support the warfighter. It defines the type of information, the frequency of exchange, which tasks and activities are supported by the information exchanges, and the nature of information exchanges in detail sufficient to ascertain specific requirements.

Operational Requirement: An established need, justifying allocation of resources to achieve a capability to accomplish approved objectives, missions or tasks.

Profile: A set of one or more base standards, and, where applicable, the identification of chosen classes, subsets, options, and parameters of those base standards, necessary for accomplishing a particular function.

Requirement: A need or demand.

Rule: Statement that defines or constrains some aspect of the enterprise.

Software: The programs, procedures, rules, and any associated documentation pertaining to the operation of an information processing system.

Standard: A document, established by consensus and approved by an accredited standards development organization, that provides, for common and repeated use, rules, guidelines, or characteristics for activities or their results, aimed at the achievement of the optimum degree of order and consistency in a given context.

Standards Profile: A set of one or more base standards and, where applicable, the identification of chosen classes, subsets, options, and parameters of those base standards necessary for accomplishing a particular function.

Supporting Products (C4ISR AF): These products provide data that will be needed depending on the purpose and objectives of a specific architecture effort. Appropriate products from the supporting product set will be developed depending on the purpose and objectives of the architecture.

System: A collection of components organized to accomplish a specific function or set of functions.

Systems Architecture: The systems architecture view is a description, including graphics, of systems and interconnections providing for, or supporting, warfighting functions. For a domain, the systems architecture view shows how multiple systems link and interoperate, and may describe the internal construction and operations of particular systems within the architecture. For the individual system, the

systems architecture view includes the physical connection, location, and identification of the key nodes (including materiel item nodes), circuits, networks, warfighting platforms, etc., and specifies system and component performance parameters (e.g., mean time between failure, maintainability, availability). The systems architecture view associates physical resources and their performance attributes to the operational view and its requirements per standards defined in the technical architecture.

Task: A discrete unit of work, not specific to a single organization, weapon system, or individual, that enables missions or functions to be accomplished. Note: Multiple processes accomplish a task; a single process may support multiple tasks.

Technical Architecture: The technical architecture view is the minimal set of rules governing the arrangement, interaction, and interdependence of system parts or elements, whose purpose is to ensure that a conformant system satisfies a specified set of requirements. The technical architecture view provides the technical systems-implementation guidelines upon which engineering specifications are based, common building blocks are established, and product lines are developed. The technical architecture view includes a collection of the technical standards, conventions, rules and criteria organized into profile(s) that govern system services, interfaces, and relationships for particular systems architecture views and that relate to particular operational views.

United States Imagery and Geospatial Information System (USIGS): The extensive network of systems used by the Department of Defense (DoD) and the Intelligence Community that share and exploit imagery, imagery intelligence, and geospatial information. These systems provide capabilities involved with the integrated management, collection, production, exploitation, dissemination and archive, and infrastructure of this information. Organizations which have some level of interface with USIGS, but are not part of DoD and the Intelligence Community, are considered participants in USIGS if they adhere to the technical and system standards.

Views, architecture: Perspectives that logically combine to describe an architecture.

APPENDIX IV

USIGS COMPLIANCE CHECKLIST

The USIGS Architecture Compliance Checklist is intended to be used when reviewing the following:

- Requirements documents such as Mission Needs Statements (MNS), Capstone Requirements Documents (CRD), Operational Requirements Documents (ORD), and other statements of need
- Acquisition documents such as System/Segment Specifications (SSS), Software Requirement Specifications (SRS), Interface Control Documents (ICD), Interface Requirement Specifications (IRS), Statements of Work (SOW), and Request For Proposals (RFP)
- Planning and guidance documents such as the NIMA Business Plan, IGC Functional Managers Guidance, and USIGS Migration Plan
- Requests For Change (RFC) and Engineering Change Proposals (ECP) related to any of the above.

Compliance with the USIGS architecture should be evaluated throughout the life cycle of a program from initial concept development to fielding. Its purpose is to help ensure that system acquisitions comply with the architecture and fundamental principles of USIGS. Managers, developers, and engineers must use this checklist as guidance in their efforts to build USIGS. It should be used as a reference when developing requirements and specifications for acquisition. It should be used when reviewing RFCs and ECPs to ensure that proposed changes are compliant with the USIGS architecture. It should also be used when developing milestone review checklists (e.g., Design Review Checklist, Pre-Ship Review Checklist) to ensure that the acquisition is moving along a path toward USIGS compliance.

Waivers for non-compliance by NIMA system acquisition programs must be approved by the Chief, Systems Engineering Office. Waivers which imply non-compliance with the Joint Technical Architecture (including non-compliance with DII COE standards) must also be approved by the NIMA CIO, ASD(C3I), and USD(A&T). Waivers which imply non-compliance with DoDIIS procedures and standards must also be approved by the DoDIIS Management Board (DMB).

The USIGS Architecture Compliance Checklist provides pointers to USIGS Architecture and related documents. Information in these documents is not repeated in this checklist.

The goal for all NIMA acquisition/development programs is to maintain compliance with the USIGS Architecture, therefore, all items in this checklist should be answered as “yes”. If not, then it is the responsibility of the program manager to follow one of the following alternatives:

a. Request and get approval for a waiver,
b. Coordinate and submit changes required to the USIGS Architecture which would allow the system being reviewed to be compliant, or
c. Modify the document being reviewed to make it comply with the USIGS Architecture.

1. USIGS Operational Architecture

The USIGS Operational Architecture Description (UOAD) describes the USIGS mission, activities, operational relationships, and the internal and external flow of information and services.

☐ Is the document consistent with the objectives stated within the UOAD? If not, should the UOAD be updated or should the document be corrected?

☐ Is the document consistent with the UOAD Activity Hierarchy (e.g., does it support one or more UOAD activities)? If not, should the UOAD be updated or is the requirement/capability out of the scope of USIGS?

☐ Is the document consistent with the UOAD Information Exchange Requirements Matrix? If not, should the UOAD be updated or is the requirement/capability out of the scope of USIGS?

2. USIGS Technical Architecture

The USIGS Technical Architecture (UTA) is a set of rules to be used to develop an integrated, interoperable USIGS. It identifies standards, conventions, guidelines, and new technological capabilities to support the USIGS operational requirements, concepts, and information flows. As a profile of the Joint Technical Architecture (JTA), the UTA also invokes mandatory JTA standards.

☐ Does the document require the use of relevant standards and standards profiles identified in the UTA (Table 3-2 and Paragraph 3.2.2)? Waivers must be obtained when standards and profiles deviate from those identified in the UTA.

☐ Does the document require the use of USIGS conventions as defined in the UTA (Paragraph 3.3)? Waivers must be obtained when implementations deviate from the USIGS conventions.

☐ Does the document require or suggest the use of relevant USIGS guidelines as defined in the UTA, (Paragraph 3.4)? Waivers for failure to do so are not required.

☐ Does the document describe software functions and services in terms of the USIGS Technical Reference Model (UTRM) (Paragraph 2.2)? USIGS requirements specifications should map functionality or describe functionality in terms of the Mission Specific Applications (defined in the UTA, Paragraph 2.2.1), Common Support Applications, Open Geospatial Exchange Services (defined in the UTA, Paragraph 2.2.2), Common Facilities (defined in the UTA, Paragraph 2.2.3), and Platform Services (defined in the UTA, Paragraph 2.2.4). Waivers for failure to do so are required.

The JTA and UTA require compliance with Defense Information Infrastructure Common Operating Environment (DII COE) specifications. The DII COE provides a foundation for building open systems. It provides a standard environment, a set of standard components, and a set of programming standards that describe how to add new functionality to the environment.

☐ Does the document require segmentation of software and databases in accordance with the rules in the DII COE Integration and Runtime Specification (I&RTS)?

☐ If the document describes a NIMA migration system does it require DII COE level 5 compliance as required by the EPIP? DII COE level 5 compliance is per the checklist provided in the DII COE Integration and Runtime Specification (I&RTS), Appendix B-5. Waivers must be obtained for migration systems that are not DII COE level 5 compliant as required by the EPIP.

☐ If the document describes a new USIGS acquisition, does it require at least DII COE level 5 compliance at IOC with a goal of achieving level 8 compliance? DII COE level 5 and 8 compliance is per the checklists provided in the DII COE I&RTS, Appendices B-5 and B-8 respectively. Waivers must be obtained for new acquisitions that are not delivered as DII COE level 5 compliant.

3. USIGS Systems Architecture

The USIGS Systems Architecture Description, Volume I: To-Be Description (USAD) describes the USIGS as a set of functional components and interfaces. These components and interfaces are related to activities in the Operational Architecture, mission specific application categories and common support services in the Technical Architecture, and data model views in the Conceptual Data Model.

- ☐ Is the document consistent with the System Element Interface Diagrams and System Information Exchange Matrix in the To-Be Description?
  - ☐ Does each requirement/capability support a single functional component? If not, can the requirement/capability be decomposed into lower-level requirements/capabilities which do support a single functional component?
    - ☐ Does each requirement/capability support a single functional component of the operational activities?
    - ☐ Does each requirement/capability support a single interface associated with that functional component? Do they support the corresponding application program interface (API), media type, and data format?
    - ☐ Does each requirement/capability support the information content, security attributes, and performance attributes?

The USIGS System Architecture Description, Volume II: USIGS Interoperability Profile (UIP) defines profiles of interface standards used to achieve interoperability among software components within the USIGS architecture. Minimum requirements for access and connectivity and critical data interchange standards are defined.

- ☐ Does the document require compliance to the UIP for interface requirements?
  - ☐ Do new USIGS acquisitions comply with the UIP for interface definitions? Waivers must be obtained for new acquisitions that do not comply with the UIP.
  - ☐ Do new interfaces to existing systems comply with the UIP or existing ICDs. Existing ICDs are used only when significant cost/schedule/performance benefits can be achieved without adversely impacting interoperability requirements.
- ☐ If the UIP does not already address the function or service under review, has an RFC to the UIP been concurrently submitted to address the new functionality required?

4. USIGS Conceptual Data Model

The USIGS Conceptual Data Model (UCDM) defines the data requirements for the USIGS community. The UCDM consists of the data models and data dictionaries that have been standardized for use across the USIGS. Data standardization is necessary for the efficient exchange of data either as an exchange format or in the method signatures (i.e., input and output parameters) of an API specification. Waivers must be obtained when implementations are not consistent with the UCDM.

☐ Does the document require conformance to the UCDM?

☐ If the document is a Logical Data Model or Physical Data Model, are its publicly visible entities and attributes a proper subset of the UCDM? If not, has an RFC to the UCDM been submitted concurrently with the document under review?

☐ If the document describes or references data exchange requirements or APIs, does it require all exchanged data elements (except formatting artifacts) to use data elements from the UCDM? If not, has an RFC to the UCDM been submitted concurrently with the document under review?

5. Migration Planning

The USIGS Evolutionary Phased Implementation Plan (EPIP) documents the evolution of the USIGS from its current As-Is state to its planned To-Be state.

- ☐ Is the document consistent with the functionality, interface requirements, performance requirements, and schedules identified in EPIP effectivities? If not, have issues been identified to the USIGS Migration Engineering Panel (UMEP) with corresponding action items assigned?

6. Test Planning

The USIGS Test, Evaluation, Transition, and Integration Plan defines the testing, evaluation, transition, and integration philosophies and policies and it provides guidance for these areas. It documents test criteria, methods and overall test planning. Testing details are provided in lower tier Test, Evaluation, Transition, and Integration Plans and Procedures.

☐ Is formal integration testing being performed at the Joint Interoperability Test Facility (JITF) planned and documented for capabilities that are being delivered to DoDIIS sites? Waivers must be obtained when integration testing at the JITF is not performed for capabilities being delivered to DoDIIS sites.

☐ Is formal interoperability testing being performed at the Joint Interoperability Test Command (JITC) planned and documented for capabilities that are being delivered to DoDIIS sites? Waivers must be obtained when interoperability testing at the JITC is not performed for capabilities being delivered to DoDIIS sites.

☐ Is formal security testing being performed by the Defense Intelligence Agency (DIA) planned and documented for capabilities that are being delivered to DoDIIS sites? Waivers must be obtained when security testing at the JITF is not performed for capabilities being delivered to DoDIIS sites.

☐ Is formal DII COE testing being performed by NIMA/SN and managed by NIMA/SE planned and documented? Waivers must be obtained when DII COE compliance testing is not performed by NIMA/SN.

☐ Is validation of Y2K compliance being performed prior to 31 December 1998? Validation of Y2K compliance is the responsibility of the appropriate PEO with oversight by the ADD/S.

7. Waiver Process

Waivers must be obtained for deviations from Paragraphs 1 through 6 unless otherwise noted. To obtain a waiver, a full justification for the waiver, including technical, cost, schedule, and performance impacts must be provided to the Chief, Systems Engineering Office. The waiver request form, Attachment I, should be used when requesting a waiver. The form must be submitted to the Chief of Systems Engineering at least 180 days prior to the programs next major milestone.

8. Referenced Documents

The following is a list of documents that are referenced in this checklist.

- USIGS Technical Architecture (UTA), 6 November 1997
- USIGS Operational Architecture Description (UOAD), 26 May 1998
- USIGS System Architecture Description, Volume I: To-Be Description, 28 July 1998
- USIGS System Architecture Description, Volume II: USIGS Interoperability Profile (UIP), 28 July 1998
- Evolutionary Phased Implementation Plan (EPIP), 1 June 1998
- Defense Information Infrastructure (DII) Common Operating Environment (COE) Integration and Runtime Specification (I&RTS), Version 3.0, July 1997
- USIGS Conceptual Data Model, 23 June 1998
- Department of Defense Joint Technical Architecture, Version 2.0, May 1998

Attachment I - Request for Waiver Form

Request for Waiver
Waiver #: _____
System/Component affected: _____
Interfaces affected: _____
Documents affected: _____
Is an RFC needed? No ☐ Yes ☐ RFC Number: _____
Description of Waiver:
Justification for Waiver (include technical, cost, schedule, and performance impacts associated with waiver):
Impact if waiver is denied:
Originator Name: _____ Phone: _____ E-mail: _____
Decision*
☐ Approved
☐ Approved until ___(date)___, at which time requirement must be satisfied.
☐ Rejected
☐ Withdrawn
Signature Chief, Systems Engineering Office _____ Date: _____

** Waivers which imply non-compliance with the Joint Technical Architecture (including non-compliance with DII COE standards) must also be approved by the NIMA CIO, ASD(C3I), and USD(A&T). Waivers which imply non-compliance with DoDIIS procedures and standards must also be approved by the DoDIIS Management Board (DMB).*