National Imagery and Mapping Agency

Acquisition & Technology Directorate

Program Plan

Part B
USIGS Migration Plan

(FY02-FY07)

28 September 2001

(U) PREFACE

(U//FOUO) The National Imagery and Mapping Agency (NIMA) is responsible for architectural development and evolution for the United States Imagery and Geospatial Information Service (USIGS). The Acquisition and Technology (AT) Directorate of NIMA has primary responsibility for the design, development, and fielding of USIGS hardware and software capabilities within the scope of the AT Program Plan. The AT Program Plan comprises the AT Development Financial Plan (Part A) and AT USIGS Migration Plan (Part B), which document the technical steps and associated funding that support the evolution throughout the Future Years Defense Program (FYDP).

(U//FOUO) The AT Program Plan documents the technical and funding profile on which the next AT Program financial and technical cycle is based. Part A of this plan defines the funding profile under which this technical migration will occur.

(U//FOUO) Part B of this plan defines the technical migration from currently existing tasking, exploitation, dissemination, and storage systems or segments, to a USIGS system-of-systems that promotes a higher level of interoperability throughout the Imagery and Geospatial Community (IGC).

(U//FOUO) Please refer questions, comments, or requests for additional copies to:

> National Imagery and Mapping Agency
> Acquisition and Technology Directorate
> Chief, System Engineering Office
> Attn: Clyde Housel, NIMA/ATSE
> Phone: 703-755-5675, Secure: 94575 5675
> E-mail: houselc@nima.mil

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Overview

1.1 (U//FOUO) Purpose

(U//FOUO) The USIGS Migration Plan describes the evolution of NIMA's imagery and geospatial segments into an integrated United States Imagery and Geospatial Information Service (USIGS) architecture. This plan communicates to NIMA Acquisition Offices and USIGS stakeholders how NIMA/AT plans to execute its acquisition program for the current Program Objective Memorandum/Intelligence Program Objective Memorandum (POM/IPOM) cycle (FY03-FY07). The USIGS Migration Plan (Part B of the AT Program Plan) provides specific details regarding the addition of new functional capabilities and the transition of imagery and geospatial legacy segments to the USIGS Objective System Architecture (UOSA). The full implementation of the USIGS architecture results in an open, collaborative information exchange environment for the Imagery and Geospatial Community (IGC). Future versions of the USIGS Migration Plan and its companion, the AT Development Financial Plan (Part A of the AT Program Plan), will address changes in customer needs, NIMA budgets, segment and project cost estimates, system performance targets, and schedules to provide snapshots of specific USIGS implementation plans. Oversight for the execution of this plan will be provided through monthly key project and quarterly program reviews.

1.2 (U//FOUO) Scope

(U//FOUO) The USIGS Migration Plan describes the evolution of geospatial information and imagery intelligence segments for which NIMA has financial and technical responsibility. NIMA is also responsible for promoting and evolving the use of common standards to ensure the integrity, operability, and usability of the USIGS by national, military and civil users. The Plan defines the steps that achieve USIGS evolution throughout this Future Years Defense Program (FYDP) period (FY02 through FY07), with particular emphasis on the execution (FY02) and first budget year (FY03). This plan, unlike the UOSA, is driven by the existing NIMA budget and program. It defines the migration steps that can be realistically achieved within these POM/IPOM funding profiles.

1.3 (U//FOUO) Intended Users

(U//FOUO) The USIGS Migration Plan applies to a broad set of USIGS Enterprise stakeholders in migration, segment acquisition, maintenance, training, and usage across the IGC.

(U//FOUO) Within NIMA, this document provides the common vision for the evolution of USIGS, which will guide detailed program planning and execution, and lower-level design decisions. It supports requirements processing, acquisition planning, segment and system design, budgeting, segment integration, and training associated with migration to the UOSA. The Plan applies primarily to the NIMA A&T Directorate offices engaged directly in system engineering, cost estimation and control, and acquisition and integration activities associated with USIGS migration.

(U//FOUO) Beyond NIMA, USIGS stakeholders include IGC organizations that task, collect, process and provide imagery, imagery intelligence, and geospatial information to the USIGS organizations that receive information and services from the USIGS, and organizations that depend on NIMA to develop and provide capabilities that support their imagery and geospatial information production missions. The USIGS Migration Plan provides the larger DoD and Intelligence Community (IC) with a roadmap for the evolution of USIGS that enables effective planning of other compatible systems. The USIGS Migration Plan will support those organizations in planning and programming their technical and infrastructure capabilities for responsive access to imagery, imagery intelligence and geospatial information.

1.4 (U//FOUO) Meeting the Needs for Imagery, Imagery Intelligence and Geospatial Information

(U//FOUO) Recognition by US policy makers that information dominance is key to national security led to the 1996 consolidation of elements of eight organizations into NIMA. The NIMA charter is to serve as the Functional Manager for imagery, imagery intelligence, and geospatial investment activities. Its challenges are to:

- Provide customers with common data access to tailored imagery, imagery intelligence, and geospatial information.
- Make imagery, imagery intelligence, and geospatial information available on short timelines at the lowest possible classification level.
- Obtain and use the best available information, whether commercial, government, or other sources.
- Use private sector services and best available technology to improve services to customers.

(U//FOUO) To achieve these goals, NIMA has developed an architecture that, when fully implemented, will replace previous custom-designed systems with a shared collaborative information services environment that makes the best use of commercially developed products. This architecture emphasizes the need to rapidly produce and disseminate information and products in an open system environment that permits the user to define the presentations most useful to its expanding customer base.

(U//FOUO) To contain costs and take advantage of the most recent developments in computing hardware, software, and communications technologies, Commercial-Off-The-Shelf (COTS) systems are used within USIGS wherever possible. Flexible work groups, multi-use data sharing tools, and commercial product formats are incorporated in the objective system design. The result is a more flexible end-to-end architecture with increased performance capabilities, reduced customer response times, extensibility, and portability.

1.4.1 (U//FOUO) Meeting the Needs of the Imagery and Geospatial Community (IGC)

(U//FOUO) As a member of the IGC and functional manager for USIGS, NIMA works to develop policies, standards, and functional capabilities to improve its ability to support national security goals. NIMA customers include decision makers at all levels of government including the National Command Authority (NCA), the IC, and theater, joint, and tactical military commanders. Overarching USIGS objectives to support these customers include:

- Enhancement of technical capabilities to make use of new collection system assets
- Evolution of legacy capabilities into an open, collaborative architecture
- Systems interoperability incorporating appropriate DoD and IC-wide information technology (IT) standards and specifications
- Leveraging advances in telecommunications technologies to provide improved connectivity and data access
- Reliance upon common hardware and software in conjunction with emerging special purpose technologies to enhance connectivity and decrease overall IGC costs
- On-demand access to information via COTS interfaces to geospatial and imagery data holdings to provide customers worldwide with improved responsiveness
- Collaboration among IGC members in the tasking, collection, processing, and exploitation of imagery and geospatial information
- Increased sharing and reduced redundancy of imagery and geospatial data through a network of interoperable, on-line libraries
- Integration of common tools for source exploitation and exploitation management.

(U//FOUO) In response to these objectives, USIGS will be composed of reusable software components that use a common communications infrastructure, including computing and communications resources coupled with Common Support Applications (CSAs) that provide common tools. It will also include MAAs that provide capabilities for acquiring, managing, archiving, disseminating and exploiting imagery and geospatial information. USIGS segments can be MAAs or CSAs; they can also deliver more than one MAA or CSA.

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(U//FOUO) Implementation of this plan and thereby moving USIGS toward the UOSA will result in a flexible USIGS information architecture better able to respond to dynamic customer needs and surge requirements. Such improvement will provide theater and tactical commanders, operations and intelligence staffs, and national and coalition leaders with more comprehensive and common pictures of the battlespace to better support the planning, execution, and assessment of a wide range of essential missions.

1.4.2 (U//FOUO) USIGS 2010: Achieving the Objective System

(U//FOUO) The transition from legacy systems to a component-based architecture cannot be immediate without the risk of disrupting customers' current production environments. To ensure continuity of operations and minimize adverse effects on the customers, USIGS is being developed, implemented, and fielded incrementally as resources and mission requirements permit. This phased implementation will transition legacy system functionality to common systems with standards-based information exchange. This approach allows incremental changes to be incorporated into customer production schemas that will continue to improve interoperability and data sharing without interruption to current production operations.

(U//FOUO) Initially, this transition will be accomplished by the installation of common systems for data delivery, exploitation, and source collection. These new USIGS capabilities are being procured as COTS products or developed as specific software applications. USIGS architecture guidelines will be used to promote the future transition to common software components for use within the IGC. Once common software components reside within a common infrastructure, rapid deployment and information access objectives of the IGC can be met.

(U//FOUO) The UOSA reflects the next step of migrating to common infrastructure and common software components, thereby allowing the user environment to be configured to meet site-specific objectives while maintaining interoperability within the IGC. The concept diagram for the UOSA is depicted in Figure 1-1, and provides a view of the USIGS that includes several, but not all, physical and functional components. The UOSA is defined in terms of elements (shown in mottled gray background in the figure), which are decomposed into physical and functional components. These components are defined in terms of the system-level requirements that they satisfy, the information and services they provide, and the interfaces they maintain to provide access to their information and services.

(U//FOUO) Figure 1-1 also introduces context for the element and component construct, the environment. The environment is used within the UOSA Description (UOSAD) documentation to describe a group of components that belong to different USIGS elements but are used together to perform a related set of USIGS functions. An important aspect of this architecture is that library, exploitation, and management functionality is provided by reusable software components using a common infrastructure and operating environment that are common throughout the entire IGC. While the functionality within components may change and new components may be added, a baseline architecture will remain to ensure users ready access to imagery, imagery intelligence, and geospatial information.

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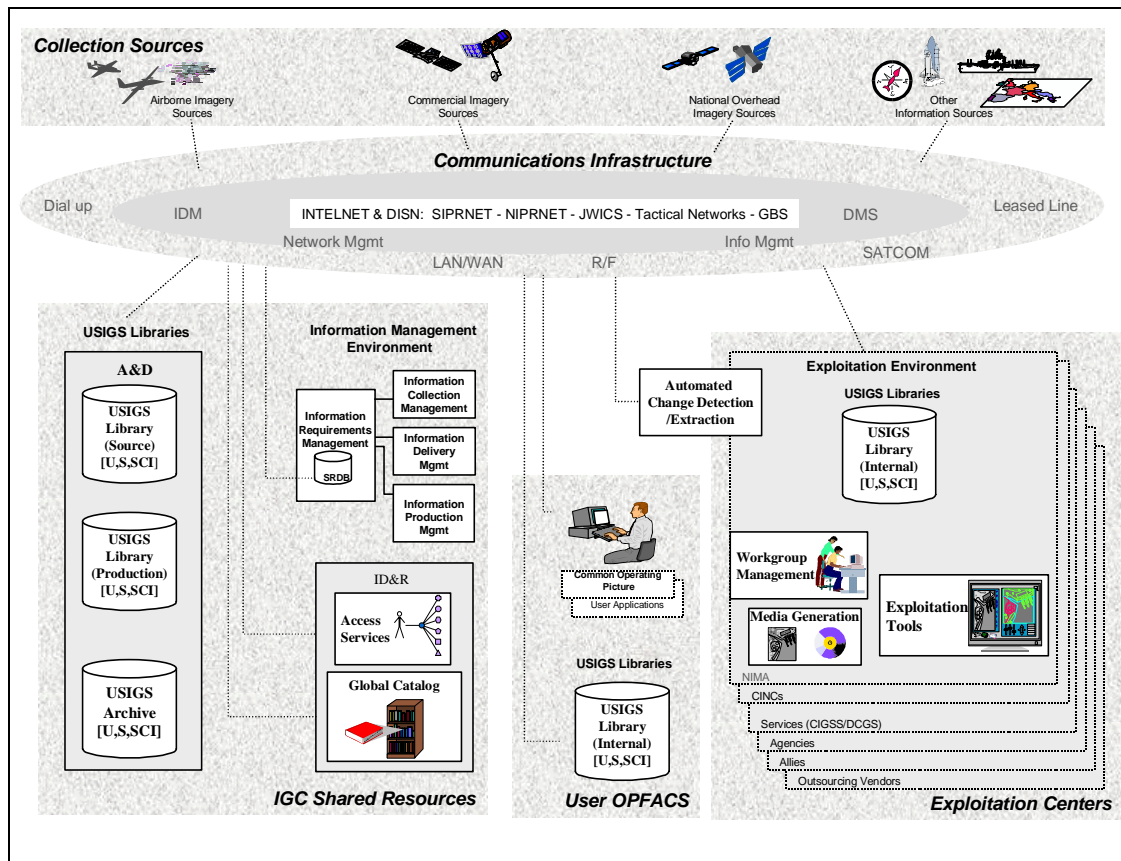
Figure 1-1 (U//FOUO) USIGS Objective System Architecture Concept

(U//FOUO) The UOSA is compliant with the Department of Defense Joint Technical Architecture (JTA) and, as defined in the USIGS Architecture, the Defense Information Infrastructure Common Operating Environment (DII COE) and the emerging Joint Operational Architecture. The ultimate goal is to provide modular applications operating according to a common software infrastructure and standard set of application program interfaces (APIs). For more on the UOSA, refer to the UOSA documentation listed in Appendix D.

(U//FOUO) Today's USIGS is being designed so that numerous development and procurement efforts will be capable of delivering system components that may be inserted and integrated within an evolving technical environment. The USIGS Migration Plan is the high-level planning documentation that takes today's USIGS architecture forward to meet the UOSA.

1.5 (U//FOUO) USIGS Migration Planning Process

(U//FOUO) The USIGS migration planning process is an integral part of the AT Program Development Process. It spans various levels of system engineering ranging from Concept Development, Enterprise Design, and the Planning, Programming, and Budgeting System/Capabilities Programming and Budgeting System (PPBS/CPBS) Process. This process provides the technical migration path for the evolution of individual imagery, imagery intelligence, and geospatial systems into an integrated USIGS. It will facilitate the transition from a closed, proprietary architecture into an open information-exchange architecture that leverages COTS products to facilitate standards-based information exchange.

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(U//FOUO) The USIGS migration development process is broken down at the highest levels as shown in Figure 1-2. These levels represent a logical grouping of related systems engineering migration-planning activities that occur during a nominal twelve-month migration cycle, beginning and ending with each fiscal year. The dynamic nature of the USIGS environment will require significant overlap among levels and, in many cases, parallel activities occurring within the different levels of the process.
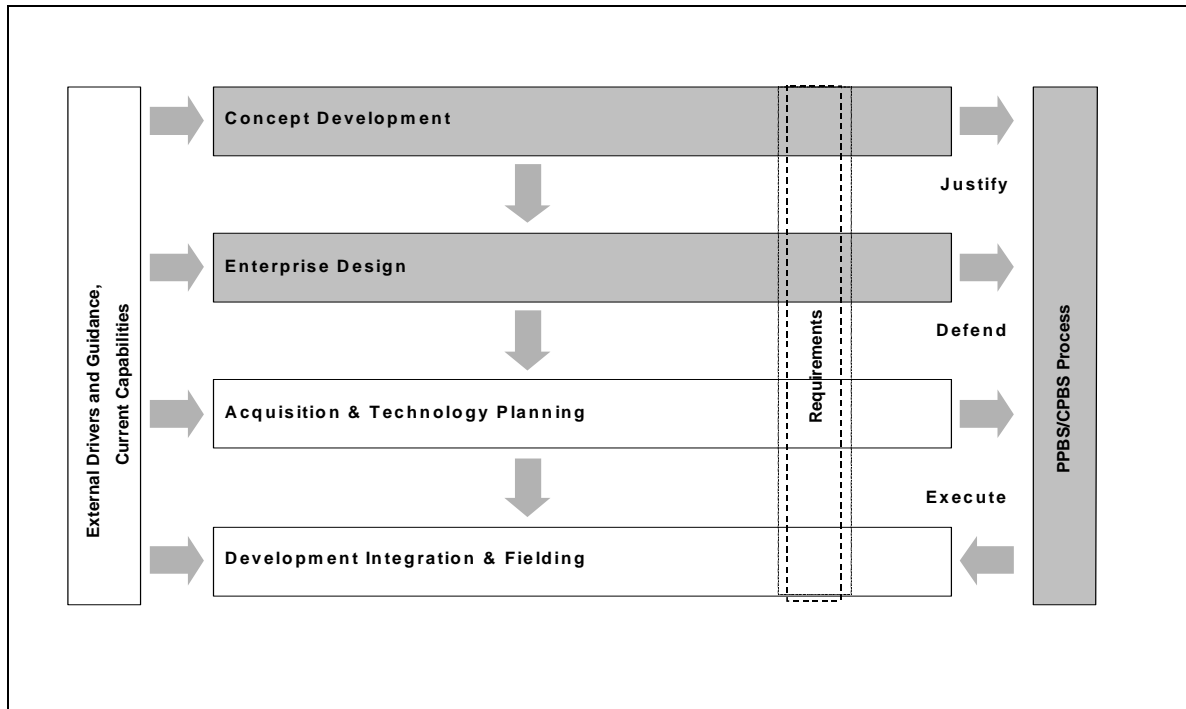
Figure 1-2 (U/FOUO) The AT Program Development Process

1.5.1 (U//FOUO) Concept Development

(U//FOUO) The AT Program Development Process begins with Concept Development. Its primary inputs are validated/prioritized user needs and community guidance. Concept Development involves identifying and grouping key functional requirements and developing a high-level migration strategy overview that identifies broad areas for technology insertion and acquisition opportunities that achieve the objectives of the UOSA.

1.5.2 (U//FOUO) Enterprise Design

(U//FOUO) The Enterprise Design phase updates the UOSA based on enterprise vision, validated user requirements and changes to USIGS operation. In this phase, requirements are allocated to architecture components, segments, projects, and technology initiatives. Interface standards are selected, and the migration strategy and Project/Segment baseline cost estimates are expanded to provide additional detail and program structure to defend planning and execution year POM/IPOM submissions, updated architecture descriptions, and an allocation of system level requirements to segments and projects.

1.5.3 (U//FOUO) PPBS/CPBS Process

(U//FOUO) USIGS migration activities cannot be accomplished without adequate funding. Congressional appropriations dictate the schedule and degree to which USIGS migration can occur. Successful NIMA POM/IPOM justification and defense hinges on an ability to identify and communicate USIGS migration planning and its associated costs.

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(U//FOUO) Further explanation of the PPBS/CPBS process is found in Part A of the AT Program Plan, the Financial Plan.

1.6 (U//FOUO) Evolutionary Migration Strategy

(U//FOUO) Realization of the UOSA (see Figure 1-3) requires an evolutionary acquisition strategy focused on the replacement of legacy systems with interoperable segments that share a common infrastructure. Comprised of reusable services and common software components, the user environment can be configured to meet site specific goals while maintaining interoperability within the IGC. The architecture portrays USIGS functionality for: (1) management of NIMA information requirements, information collection, delivery and exploitation activities, (2) archive and dissemination of imagery, imagery intelligence and geospatial information, (3) exploitation of imagery intelligence and geospatial information, and (4) communications infrastructure. Corporate applications are not addressed in the UOSA.

(U//FOUO) The structure used for organizing and planning migration activities consists of Elements at the first tier, MAA categories at the second tier, and Overarching Functional Requirements at the third tier. The top two tiers are discussed in the UOSA Description and are used in the USIGS Enterprise Requirements Specification (UERS). Functional Requirements at the third tier are identified in the element-by-element discussion of the migration overview, and are consistent with the UERS.

(U//FOUO) Allocating legacy segment functionality to four USIGS Elements facilitates system evolution and operational continuity. These elements are Information Management, Archive and Dissemination, Exploitation, and Communication Infrastructure. They define the highest level functional breakdown of activities necessary to produce imagery, imagery intelligence, and geospatial information and products. Replacing end-to-end system development with spiral evolution of a component based architecture entails further allocation of required functionality into logical MAA categories.

(U//FOUO) In the context of USIGS, each MAA category represents a future arrangement of functionality to support the USIGS mission, as opposed to a single large application. MAA categories are dynamic and will continue to be refined throughout the evolution of the USIGS. The current MAAs are identified in Table 1-1.

USIGS Element	Mission Area Application (MAA)
Information Management	Order Entry and Tracking Workflow Management
Archive and Dissemination	Information Storage Information Delivery Information Discovery and Retrieval Information Reproduction and Replication
Exploitation	Data Preparation Data Exploitation Information Generation Exploitation Support
Communications Infrastructure	Computing Hardware and Information Exchange Platform Services and Common Facilities Communications (Local and Wide Area)

Table 1-1 (U//FOUO) USIGS Element to Mission Area Application (MAA) Relationship

(U//FOUO) The USIGS Communications Infrastructure Element is the planned evolution of the NIMA Enterprise Network (NEN) in support of USIGS migration. Because of system classification issues, this element is described in

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detail in Appendix E to this volume; however, many individual system migration activities are included within the Migration Summary sections of this volume. The Communications Infrastructure Element includes necessary hardware, networks, and communications services, but does not include the NIMA corporate applications infrastructure, such as human resources, procurement and contracting, and security.

(U//FOUO) Future segments evolve within the categories identified above will operate in a common infrastructure, which includes common support applications, common facilities, distributed computing, platform services, information exchange and communications (local and wide area), and computing hardware. The relationship of segments to MAA categories and elements is shown in Table 1-2.

USIGS Element	Mission Area Application (MAA)	USIGS Segments, Tools, and Component
Information Management	Order Entry and Tracking	Shared Requirement Data Base (SRDB) Requirements Management System (RMS) Source Acquisition Segment (SAS) System Tasking and Tracking (STAT)
	Workflow Management	Imagery Exploitation Support System (IESS) Production Management Alternate Architecture (PMAA) NIMA Exploitation System (NES) National Area Coverage Data File (NACDF) Target Management System (TMS)
Archive and Dissemination	Information Storage	Demand Driven Direct Digital Dissemination (5D) Image Product Library (IPL) USIGS Warfighter Information Library (UWIL) Commercial Satellite Imagery Library (CSIL) Command Information Library (CIB) Imagery Data Exploitation System (IDES) National Information Library (NIL) MC&G Information Library (MCGIL) Digital Product Data Warehouse (DPDW) Data Service Segment (DSS) Feature Level Database (FLDB) NIMA Geospatial Storage System Geographic Names Processing System
	Information Delivery	Rapid Dissemination System Migration Systems (RDSMS) Defense Dissemination System (DDS) Information Delivery Services (IDS)
	Information Discovery and Retrieval	Enhanced Analyst Client (EAC) Web-based Access Retrieval Prototype (WARP) Navigation Safety System (NSS) Hydrographic Source Assessment System (HYSAS) Client 2001 Information Access Services (IAS) Global Catalog
	Information Reproduction and Replication	Hardcopy Reconstruction Unit (HRU) Remote Replication System (RRS) Computer-to-Plate System (CTPS)

Exploitation	Data Preparation	Digital Geodetic Support System (DGSS) Geodetic Data Applications System II (GDAS II) Integrated Exploitation Capability (IEC) Hydrographic Source Assessment System (HYSAS) Integrated Source Exploitation Environment (ISEE) Segment 18 Target Management System (TMS) Aeronautical Migration System (AMS) Front-End Processing Environment (FPE)
	Data Exploitation	Data Extraction Segment, Alpha (Upgrade) (DE Alpha) Integrated Exploitation Capability (IEC) Data Capture and Finishing Environment (DCAFE) Alternate Imagery Exploitation/Revision System (AIX/RS) Interactive Compilation System Upgrade (ICSU) Navigation Safety System (NSS) Geographic Names Processing System (GNPS) NIMA Production Cells (NPC) Aeronautical Migration System (AMS) IA Light Tables
	Information Generation	Compressed Aeronautical Chart (CAC) Common Mapping Production System (CMPS) Integrated Exploitation Capability (IEC) Interactive Quality Review System (IQRS) Navigation Safety System (NSS) Data Capture and Finishing Environment (DCAFE) Alternate Imagery Exploitation/Revision System (AIX/RS) Interactive Compilation System Upgrade (ICSU) Controlled Image Base/Validation System (CIB/VS) Point Positioning Production System (PPPS) Front-end Processing Environment (FPE) Worldwide Navigation Warning System (WWNWS) NIMA Production Cells (NPC) Standalone G&G Systems
	Exploitation Support	National Imagery Derived Products (NIDP) Common Architecture Support Services (CASS) MATRIX COTS ELTS Multi-image Exploitation Toolkit (MET) Tool Development EXPIRT Special Mensuration Service (SMS) Joint Mapping Toolkit (JMTK) Joint Targeting Workstation (JTW) RULER RAINDROP
Communications Infrastructure	Computing Hardware and Information Exchange	See Appendix E
	Platform Services and Common Facilities	See Appendix E
	Communications (Local and Wide Area)	See Appendix E

Table 1-2 (U//FOUO) USIGS Segment to MAA to Element Relationship

(U//FOUO) Figures 1-3 and 1-4 depict the relationship of USIGS segments to the UOSfunctional components. Segment migration paths provide an overview of current segment evolution toward the objective architecture. Much of the functionality of today's segments will be retained in the objective architecture while redundant functionality

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will be eliminated. Functionality currently provided by GOTS solutions will often be replaced by COTS solutions. Segment interoperability will be enhanced through the implementation of common user access and reusable software components.

(U//FOUO) Some functional components depicted in the UOSA reflect new capabilities that have no counterpart in the current segments or in the funded acquisition baseline. Those components reflect functionality that must be addressed in the POM/IPOM process.

(U//FOUO) Figures 1-3 and 1-4, also provide a high-level view of USIGS migration and mapping through FY07. A more detailed understanding of planned steps in migration can be gained from the individual element evolution diagrams in the sections that follow. Understanding of the more complex reallocation of requirements (and functionality) from legacy segments to new segments can be obtained from the individual element migration requirements analysis tables and discussions.
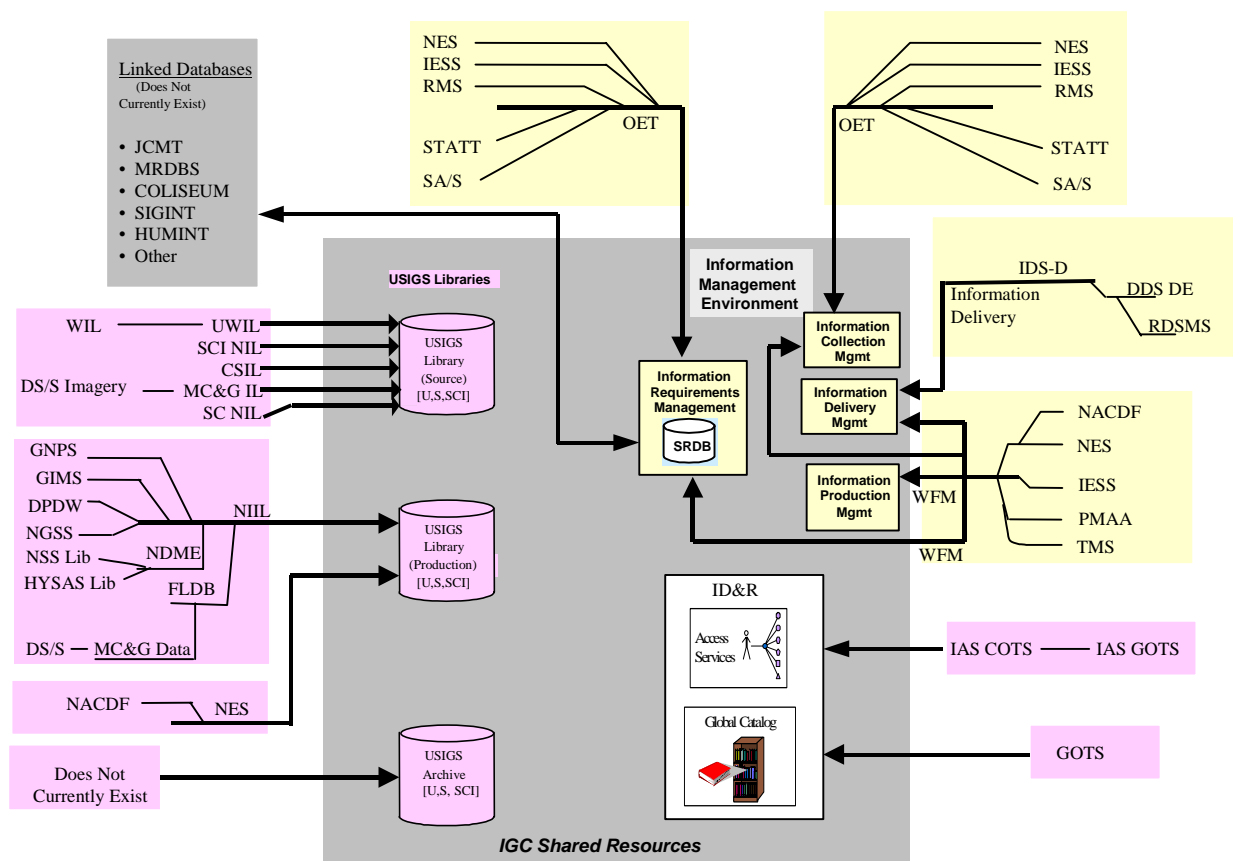
Figure 1-3 (U//FOUO) IGC Shared Resources Overview
(Mapping of Segments to Functional Components)

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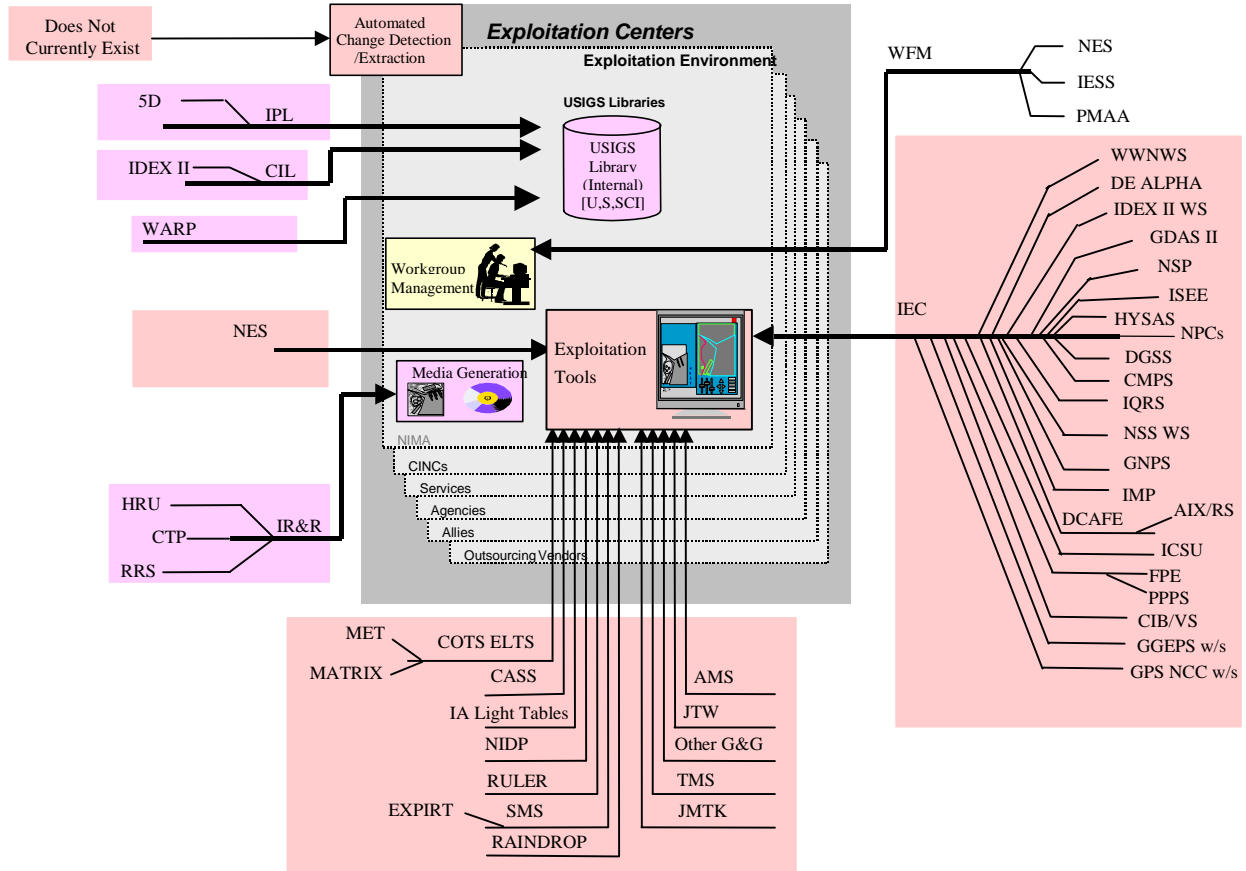
Figure 1-4 (U//FOUO) Exploitation Centers Overview
(Mapping of Segments to Functional Components)

1.7 (U//FOUO) USIGS Key Projects

(U//FOUO) The current plan for NIMA to migrate from the diverse structure of overlapping systems into the USIGS Objective Architecture is to manage the various segments and upgrades as key capability projects, linked by common thrusts. There are many drivers to this approach, among them Congressional direction to migrate off the Imagery Data Exploitation System II (IDEX) II program; EIS test, demo, delivery schedule; Future Imagery Architecture (FIA) development, test and demo, TPED Assessment Process/Tasking, Processing, Exploitation, and Dissemination (TAP/TPED) result; NIMA Center of Excellence, to include WNY closure, Geospatial Information/Imagery Analyst (GI/IA) consolidated production, data versus product specific production focus; NIMA strategic vision, the USIGS 2007/2010 Conops, and the integration of IGC and IC operational architectures (Joint Intelligence Virtual Architecture (JIVA), Global Command and Control System (GCCS)), migration off of the legacy Digital Production System (DPS) equipment, and the Requirements Management System/Imagery Exploitation Support System/National Exploitation System (RMS/IESS/NES) migration, and finally, a NIMA commitment to a process-focussed acquisition infrastructure, and system level integration, test, performance modeling. To accomplish the migration, NIMA is focusing on key project capabilities, which are listed below.

1.7.1 (U//FOUO) NIMA Imagery Exploitation System (NIES)

 (U//FOUO) The NIES is one of NIMA's highest priority Projects. It includes the efforts formerly managed under the IDEX II Replacement Project (IRP). The NIES is made up of five segments (new and legacy) that are integrated to replace the IDEX II capability at Department of Defense Intelligence Information System (DoDIIS) sites. The IDEX II system provides storage of digital imagery, queue management, high-end softcopy exploitation functionality and digital dissemination of imagery for both the National and Military Intelligence Communities. NIES is a COTS-based open architecture that replaces IDEX II central processing and data archive and storage functions with the Command Information Libraries (CILs). The NIES Dissemination Element (DE) segment continues to provide imagery dissemination to the CIL, as it did to IDEX II and Imagery Exploitation Support System (IESS) performs NIES workflow management. The IDEX II imagery workstations are replaced with Integrated Exploitation Capability (IEC) workstations to provide a commercial-off-the-shelf (COTS)-based imagery and geospatial exploitation and production capability. IEC includes a comprehensive suite of workstations, servers, intra-IEC communications and a framework of integrated tools and applications and will integrate Remote View, Digital Imagery Exploitation and Production System (DIEPS), and VITEC Electronic Light Tables (ELTs) to support imagery exploitation. NIES users will interface with the system via either of two Netscape browser clients: Information Access Services (IAS) Common Client (CC) -- to be upgraded to Client 2001 or the Enhanced Analyst Client (EAC). NIES/IRP deployment began in May 2000 and will complete in FY02 after replacing the IDEX II Systems at JFCOM, PACOM, EUCOM, CENTCOM, STRATCOM, NAIC, and the 480th IG.

1.7.2 (U//FOUO) USIGS Library Environment (ULE)

 (U//FOUO) The NIES architecture will be delivered to eight additional non-IDEXII DoDIIS sites in FY04-FY05, under the USIGS Library Environment (ULE) Project. ULE will provide the same functionality and performance as NIES, but will be scaled to meet the workload requirement of each ULE site.

1.7.3 (U//FOUO) Enhanced Imaging System (EIS)

 (U//FOUO) The EIS Project requires the components of the USIGS to expand in order to improve the IGC's softcopy exploitation environment. New USIGS capabilities (i.e., CILs, IEC, Information Access Services (IAS) Common Client (CC)) and enhanced legacy segments (e.g., IESS, Enhanced Analyst Client (EAC), Dissemination Element (DE)), are designed to work together to provide EIS imagery, imagery metadata, geospatial data, and management information to the analyst and exploitation manager. This includes Commercial-off-the-Shelf Software (COTS) workstations, local reference information storage, COTS exploitation and support software and interfaces with workflow management software that allows for discovery, sharing, exploitation and management of imagery and non-imagery data. Shared collaborative management applications will provide greater coordination of USIGS tasking, collection, processing, exploitation and dissemination activities. Improved COTS based exploitation workstations and applications will provide the tools necessary to analyze and extract information from the various data sources. Some existing USIGS segments or systems were modified in order to use EIS. See Appendix E for additional discussion.

1.7.4 (U//FOUO) Future Imagery Architecture (FIA)

(U//FOUO) This project is focused on a future architecture requiring USIGS components to expand or adapt in order to improve the IGC softcopy exploitation environment. Refer to Appendix E for discussion of this project.

1.7.5 (U//FOUO) Washington Area Imagery Analysis Architecture

(U//FOUO) The Washington Area Library Architecture (WALA) for Imagery Analysis (IA) Project replaces the RDSMS/IDEX capability at the five NIMA locations: NIMA Operations Center (NOC)-I, NOC-P, NIMA Navy Yard, NIMA Langley, and NIMA Defense Intelligence Analysis Center (DIAC). The project will replace the existing IDEX II workstations with IEC workstations to provide a COTS based imagery and geospatial

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exploitation and production capability. The IDEX archive will be replaced with a feed from the National Information Library (NIL) or the CILs. A COTS based open architecture will replace the existing IDEX II central processing functions and data holding systems.

1.7.6 (U//FOUO) Mapping, Charting, and Geodesy (MC&G) Imagery Flow (MCGIF)

(U//FOUO) The MC&G Imagery Flow Project represents a system of functional components that will allow NIMA to request, receive, catalog, exploit, store and retrieve a new source material by developing new segments (functional components) as well as modifying existing segments currently used in production and production support processes. The Initial Operating Capability (IOC) of this system of segments will occur during the spring 2002 timeframe, with additional phased deliveries of system capabilities to be executed through the end of the third quarter, 2002. The use of new source data for MC&G production will generate the creation of an MC&G Information Library (IL) to receive, store, and provide imagery and support data to MC&G production segments for exploitation and creation of geospatial data and products. The MC&G production segments will be modified to accept, exploit and store this new data and its associated products. This project will include several upgrades and enhancements to existing infrastructure both internal and external to NIMA.

1.7.7 (U//FOUO) NIMA Center of Excellence (NCE)

(U//FOUO) The NCE will provide a right-sized, well-trained, and more productive workforce to implement an integrated information environment from which customers can manipulate information, i.e., select, integrate, display, transform or fuse with data from other sources, to satisfy their content and format needs. The NCE provides for: (1) feature extraction in a form that allows maintenance of features to be updated quickly and stores old feature information for history; (2) softcopy exploitation; (3) technology infusion (object-oriented); (4) moving away from a "product" file based storage. This workforce will utilize state-of-the-art digital exploitation systems; effective, secure communications; and high quality multi-sensor imagery at a consolidated location. The NCE enables NIMA to move towards greater workgroup integration for creating imagery intelligence and geospatial information on issues and regions – shaped by customer priorities.

(U//FOUO) The goal of integrated production is to provide national, military, and civil customers with timely and accurate imagery, imagery-derived intelligence and geospatial information. Integrated production will allow:

- Ability to provide custom products and services routinely
- Integration of NIMA imagery, imagery analysis, and geospatial information
- Improved capacity to access, process, sort, and visualize information
- Increased knowledge/experience of specialized skills that can converge to provide detailed and comprehensive analysis
- Enhanced customer-to-NIMA-analyst rapport on regional, special issues or standard requirements
- Increased efficiency to assemble multi-disciplinary workgroups
- Virtual projection of NIMA assets to assist the community

1.7.8 (U//FOUO) NIMA Production Center – Americas (NPC-A)

(U//FOUO) This project represents the initial implementation of integrated production at the NIMA Center of Excellence. Integrated production is defined as a production strategy that collaboratively collocates many Directorate of Operations (DO) disciplines to focus over a common area of interest. This integrated production environment enables Imagery Analysts and Geospatial Analysts to perform regional intelligence (i.e., North and South America and the Caribbean region) and geospatial exploitation. Doing so enhances the readiness state and posture for relevant, timely, and accurate responses to the customers mission specific needs. NPC-A directly supports the NIMA Strategic Plan goal to enhance information available to its customers.

(U//FOUO) Significant elements of the NPC-A are the Digital Media Management System (DMMS), Integrated Exploitation Capability (IEC), and the Dissemination Element (DE). The DMMS will function as the NPC-A imagery, imagery information, and geospatial information library. IEC will provide exploitation capabilities. The DE will capture softcopy intelligence imagery and support data and provide these data to DMMS. Softcopy geospatial imagery will be provided via D2C cassettes. NPC-A will also have connectivity to all NIMA networks (e.g., Sensitive But Unclassified (SBU), Secret Collateral Enterprise Network (SCEN), Aqua LAN) and many data stores (e.g., Data Product Data Warehouse, DE Alpha) to support production.

1.7.9 (U//FOUO) USIGS Warfighter Information Library (UWIL)

(U//FOUO) The UWIL Project will increase the availability of Secret NTM imagery to the warfighter by evolving the existing non-USIGS Joint Warfighter Imagery Library to the UWIL with no downtime or degradation to Joint Warfare Analysis Center (JWAC) and existing support. The scope of this project includes upgrades to multiple USIGS segments and supporting communications infrastructure. Some limited hardware will be re-utilized from the existing JWAC Architecture. Additional CIL hardware will be added and the NIMA Library (NL) 3.2 software baseline will be installed. The Enhanced Processing Segment (EPS) andDE will be upgraded to provide an increased volume of compressed imagery over an improved JWAC communications network. Secure Internet Protocol Router Network (SIPRNET) communications capability will be upgraded on the export side of the UWIL to handle increased data and data sizing.

1.7.10 (U//FOUO) USIGS Softcopy Exploitation Project (SEP)

(U//FOUO) The USIGS Softcopy Exploitation Project is focused on enabling integrated USIGS components to expand and improve the IGC softcopy exploitation environment. SEP is part of a collection of new USIGS capabilities (i.e., CILs, IEC, Information Access Services (IAS) Common Client (CC)) and enhanced legacy segments (i.e., IESS, EAC, DE), designed to work together to provide imagery, geospatial data, and management information to the analyst. USIGS will provide an open architecture framework which leverages commercial technologies, emphasizes use of COTS technologies and products where appropriate, and features overall integration to provide an evolving digital environment.

(U//FOUO) Additional softcopy exploitation deliveries will occur at NIMA St. Louis, NIMA Bethesda, NIMA Navy Yard, NOC-I, NIMA Langley, NOC-P, NIMA DIAC, NIMA College, USIGS Integrated Test Facility (ITF), Commands, Service Centers, Service Units, Service Training Centers and Ships.

(U//FOUO) Out-year development will be concentrated on migrating geospatial capabilities from legacy systems (e.g., DCAFE, DE Alpha, AMS, TMS, and Exploitation Tools) to platform independent applications.

1.7.11 (U//FOUO) Information Dissemination Services (IDS)

(U//FOUO) The IDS project supports the USIGS discovery, delivery, and replication of imagery from various provider sources through web-based development environments along with e-Business enterprise portal technology concepts to implement both the Information Delivery Service and Information Discovery and Retrieval Service Mission Area Applications of the USIGS Technical Architecture.

(U//FOUO) IDS will develop push-like capabilities based upon user-tailored profiles focused to their specific information interests. In concert with the NIMA Library Program, IDS will provide a modernized replacement of the Defense Dissemination System, both the Enhanced Processing System and the DE. IDS will provide a temporary buffer of inputing information to await various transmission mechanisms to provide that information to an end user via common user infrastructure communications such as NIMA Library communications, Joint Worldwide Intelligence Communications System (JWICS)/SIPRNET, Global Broadcasting Systems or any other secure wireless transmission methods. Additionally, IDS will implement the next generation of the Information Access Services (IAS). IDS will also develop replacements for the Hardcopy Reconstruction Unit and Remote Replication Systems capabilities.

1.7.12 (U//FOUO) Information Management (IM) Project

(U//FOUO) The IM Project consists of acquiring an Order Entry and Tracking (OET) and Workflow Management (WFM) capability. When deployed, the IM Project will provide users at over one hundred sites with comprehensive software tools that will capture customer requirements for imagery and non-imagery products and information. The IM Project will also track and manage the collection of the imagery and non-imagery data in support of intelligence and geospatial information needs. Development of Order, Entry, and Tracking (OET) and Workflow Management (WFM) will be delayed until FY06; deployment will take place beyond the FYDP.

(U//FOUO) The OET application will allow the user to develop, refine, and coordinate the information need as it progresses through the approval process in accordance with IGC organizational policies. The information need will be registered in the Shared Requirements Database (SRDB) and if approved, becomes a requirement. The information requirement will be maintained in the SRDB and assigned to the appropriate organization, which will perform exploitation, production/reproduction, distribution, collection, or tip-off. The organizations will either pull these requirements from the SRDB using the WFM application or have OET push the requirements to them using OET information profile capabilities.

(U//FOUO) WFM supports and manages imagery and geospatial analysis and production by assigning and managing exploitation and production workflow, staging imagery and source materials for exploitation, and initiating product and formation dissemination. The WFM applications interact with Exploitation Systems and Archive and Dissemination Systems services to capture and maintain task status and metrics. The WFM application will receive or pull new information requirements containing exploitation, production and distribution requirements from the SRDB based on a determination mode in OET of whom (e.g., exploitation organization, production and distribution organizations) to task. The WFM application will provide tools to enable users to plan, prioritize, assign, monitor, and measure exploitation, production, and distribution work activities. These tools will provide a robust and flexible capability to define and manage work to include federated and collaborative activities. The WFM application will use organizational workgroup profile information to assist in determining which organizational workgroups will be tasked with information requirements and associated components. Assignments may be further broken down into tasks and activities for assignment to workgroups (e.g., NIMA Centers of Excellence), segments, and individuals as the work activity is organized to satisfied the requirements. The WFM application will collect metrics on the status of work activity for use by managers. Additionally, appropriate data will be compiled and forwarded via the SRDB to the OET application for requirement tracking. As products, reports, and information are completed by exploitation and information services capabilities, they are made available to the user, included as part of the appropriate IGC holdings, and reported to WFM with a requirements status update.

1.7.13 (U//FOUO) Common Imagery Ground/Surface System/Distributed Common Ground System (CIGSS/DCGS)-I

(U//FOUO) The objective of the CIGSS/DCGS-I is to migrate existing separate ground imagery systems to a family of networked, interoperable, scaleable, ground and afloat, mobile and fixed elements that receive, process, exploit and disseminate multi-source and multi-intelligence (Signals Intelligence (SIGINT), Imagery Intelligence (IMINT), Measurement and Signature Intelligence (MASINT)) information. The CIGSS portion is to be completed by FY03. The DCGS and its DCGS-I portion are intended for completion by FY07. Multi-source and multi-intelligence information is derived from airborne platforms and sensors, and commercial and national satellite sensors and other intelligence sources.

1.7.14 (U//FOUO) Joint Targeting Workstation (JTW)

(U) JTW is a standardized software tool suite developed by the NIMA mission partner to provide the users with a suite of National and tactical sensor models and tools for integration into user systems (e.g., Precision

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Targeting Workstation (PTW), Enhanced Precise Positioning Integrated Capability (EPPIC)). NIMA assumed program management responsibility for JTW in FY01.

1.7.15 (U//FOUO) USIGS Geospatial Production Management (UGPM)

(U) The objective of the UGPM project is the replacement of the geospatial Production Management Segment (PM/S) functions, and begins the consolidation and migration of all similar functions to the eventual Workflow Management service. The current implementation of the Production Management Alternative Architecture (PMAA) segment will provide production management. The legacy segment, PM/S that generated geospatial information requirement requests and source utilization packages, scheduled and managed geospatial production flow, tracked and reported production status was retired in 1999. Production workarounds were implemented to maintain production capability until UGPM and the intermediate migration of functions to the PMAA.

(U//FOUO) SECTION 2

USIGS ELEMENT MIGRATION

(U//FOUO) This section presents a description of the USIGS Elements, their component (MAAs, and their Element-level migration throughout the FYDP. Discussion is focused on the Execution and/or Budget Years (FY02-03).

(U//FOUO) The migration planning for each MAA is accompanied by an "evolution diagram" (sometimes referred to as a "fishbone chart") that illustrates the FYPD planning migration of USIGS segments, tools, and functional components within the MAA. The MAA evolution diagrams also highlight the Execution and/or Budget years.

2.1 Information Management Element Overview

(U//FOUO) The USIGS Information Management Element comprises the segments that will provide the capability leading to the development of the OET and WFM for the USIGS Objective System Architecture (UOSA). Originally scheduled for completion by FY 2005, development of OET and WFM has been delayed until FY06; deployment will take place beyond the FY 2003-07 FYDP. General impacts of this action on USIGS include the extension of legacy system operation through the FYDP. For example, the transition of the RMS into the Shared Requirements Database (SRDB) and OET in FY01 will not take place as originally scheduled. Similarly, the transition of the other segments in the IM element will also occur later than originally scheduled.

(U//FOUO) The USIGS Information Management Evolution Diagram (Figure 2-1) depicts planned migrations for Information Management systems through FY07. Due to the delay in the deployment of OET and WFM, little transition takes place in either MAA category within this element during the FYDP. This element consists primarily of the continuation of the legacy segments described below. An exception to this is the Washington Area Library Architecture (WALA) modifications that begin and complete the transition to the National Exploitation System (NES) during FY03 and the National Area Coverage Data File (NACDF), which also transitions into NES during the same fiscal year.
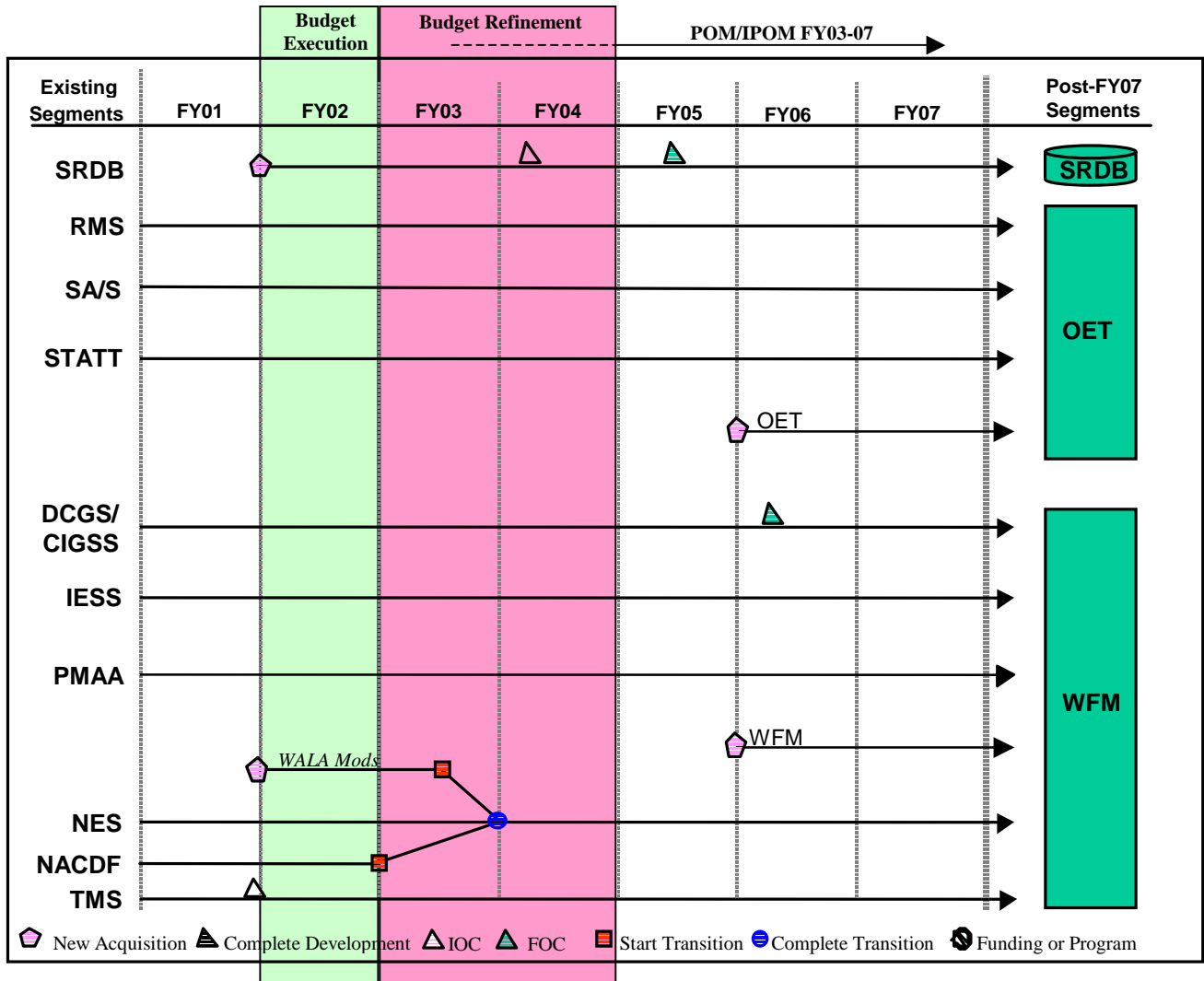
Figure 2-1 Information Management Evolution Diagram

2.1.1 Order Entry and Tracking (OET) MAA

(U//FOUO) The OET MAA category will encompass select legacy segment functionality and incorporate new capabilities needed to support imagery, imagery intelligence, and geospatial information management processes and requirements in post-FYDP era. When completed in the post FY07 time frame, OET will provide applications to generate, coordinate, process, task, track, and support the request for, and delivery of, imagery, imagery intelligence, and geospatial information, products, and services. Segments within the OET MAA category will also support the development, coordination, review, validation, and approval of IGC information needs.

(U//FOUO) The OET will use the SRDB as its need/requirement registry and will provide tools to query and track requirement satisfaction, submit feedback on needs and requirements, provide accountability, and report status. The OET comprises four segments: the SRDB, the RMS, Source Acquisition Segment (SA/S), and the System Tasking and Tracking Tool (STATT). A discussion of these segments follows.

2.1.2 Workflow Management (WFM) MAA

(U//FOUO) Workflow Management is comprised of the functions of the NES, Imagery Exploitation Support System (IESS), and Production Management Alternate Architecture (PMAA) (formerly PM/S) and is planned to consolidate these functions into a common, integrated service in the post-FYDP period. It will integrate the WFM applications used to manage and support imagery and geospatial production. It will support assigning and managing exploitation and production workflow, staging imagery and source materials for exploitation, production, reproduction, and initiating information dissemination. WFM applications will interact with the SRDB, NIMA libraries, OET, and exploitation and production software and services to manage workflow and provide production status and metrics.

(U//FOUO) Workflow Management encompasses six segments: the CIGSS/DCGS-I; the IESS; PMAA; NES; NACDF; and TMS. A discussion of these segments follows.

2.2 (U//FOUO) Archive & Dissemination (A&D) Element Overview

(U//FOUO) The MAAs that comprise the A&D Element provide the capability to store, deliver, and reproduce imagery, imagery intelligence, and geospatial information for IGC customers. Cataloging, discovery and retrieval services within A&D deliver requested information either through a customer-defined, profile-driven ordering service that provides customers with the capability to specify their information needs, or through an "on-demand" ordering capability that provides customers with previously stored data.

(U//FOUO) The A&D Element supports customer query, browse, and imagery/data export activities using a common client to provide a customizable, single point-of-entry user interface with NIMA information sources. Storage, retrieval, and the delivery of imagery, imagery intelligence, and geospatial information will be provided for data producers to support the fusion and visualization of imagery, imagery-derived products, and geospatial data. Both electronic and media (e.g., hardcopy, tape, CD-ROM) transfer of data to IGC customers will be supported at multiple levels of security.

(U//FOUO) With the adoption of common collection formats by DoD and the introduction of multi-format processing capabilities within USIGS, most ground-based imagery processing facilities will be capable of processing imagery produced by a variety of collection platforms and sensors. The A&D Element provides services supporting information storage, discovery, dissemination, retrieval and media generation. Storage services maintain the information holdings of the USIGS and ensure that these holdings are available to authorized USIGS users. Discovery services allow customers to research what information is available by searching catalogs describing the holdings in USIGS libraries. Retrieval services allow users to obtain a copy of information maintained in USIGS information holdings. Dissemination services allow customers to subscribe to the USIGS information service and receive information of interest to them by specifying standing queries (also referred to as retrieval/dissemination profiles). Standing queries examine data flow into USIGS information holdings and determine if the data match the criteria specified by a customer. The actual information or a notification of its availability is sent to the customer anytime a data match is identified. Media generation services allow the A&D Element to replicate information holdings in hardcopy or on digital media such as CD-ROM. Media generation services also allow customers to request physical creation of media and their delivery as an alternative to the electronic delivery provided directly by dissemination and retrieval services.

(U//FOUO) The A&D MAA categories will integrate selected legacy system functionality with newly developed functional capabilities into the following four MAA categories: Information Storage, Information Discovery and Retrieval (ID&R), Information Delivery, and Information Reproduction and Replication (IR&R).

(U//FOUO) NIMA manages the acquisition and life cycle maintenance of new and existing systems that support information storage, information access, information delivery, and information reproduction and

replication of imagery, imagery intelligence and geospatial information. The principal objectives of these systems are to: (a) deliver information from its source into libraries; and (b) provide national, DoD, government agencies, and other authorized organizations the capability to store, retrieve, package, and deliver USIGS information in support of their missions.

(U//FOUO) The USIGS A&D Evolution Diagrams that follow depict planned migrations for the major A&D segments through FY07. The migration strategy for ID&R, Information Delivery, and IR&R remains budget-driven and was impacted by the NIMA USIGS Re-baseline initiative of mid-FY01.

2.2.1 (U//FOUO) Information Storage MAA Migration

(U//FOUO) Information Storage consists of scaleable storage capabilities for all categories of customers to input, manage, and retrieve imagery, imagery intelligence, and geospatial information. Services performed include import, export, query processing, queuing, storage, and storage management. Figure 2-2 portrays the functional evolution for the Information Storage MAA.
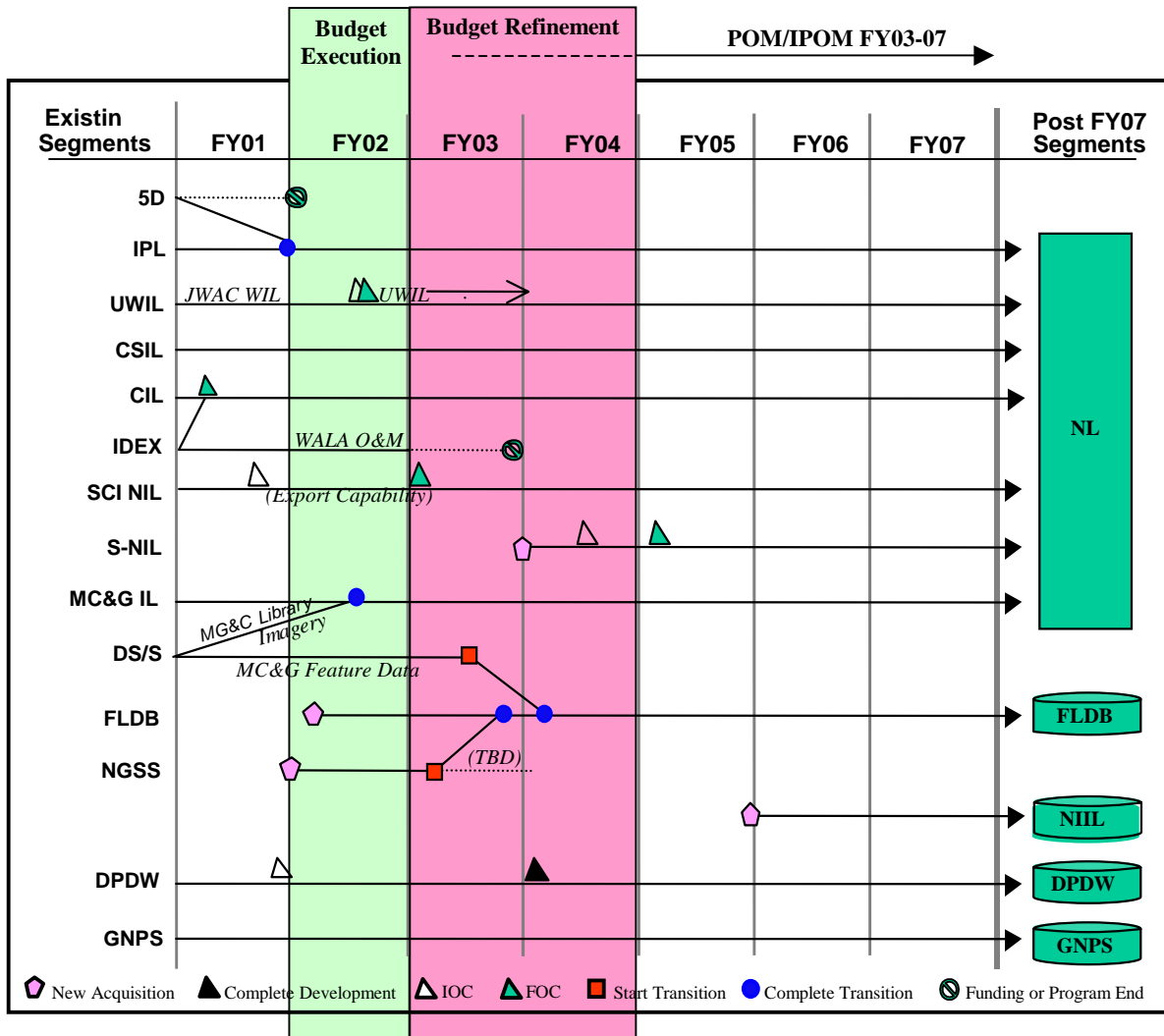
Figure 2-2 (U//FOUO) Information Storage Functional Evolution Diagram

(U//FOUO) Information Storage will develop and support the software deployed as part of the NIMA Libraries (NL) and portions of the geospatial library projects. Information Storage will include both prompt-access for USIGS data of high contemporary interest and high-assurance permanent archives for data of long-term interest.

(U//FOUO) Critical new components of the USIGS evolution have come on-line as migrating systems are being fielded which ensure continuity of capabilities through EIS and FIA transition periods. This hybrid environment is expected to continue over the FYDP as USIGS libraries and key communications infrastructures are deployed across the IGC. Sufficient capability is envisioned to be in place by the 2005 timeframe, enabling many of the benefits described by the USIGS dissemination vision in the NIMA Strategic Plan.

(U//FOUO) Within the context of the NIMA Libraries project, new and changed requirements for Geospatial Information (GI) data storage to support geospatial product production required USIGS segments to task, receive, store, provide, and exploit source data in support of an overarching NIMA GI production vision. Performance standards were established by the MG&C Imagery Flow (MCGIF) project. MCGIF established a USIGS Library for MC&G tasked geospatial imagery, known as the MC&G Information Library (MCGIL).

2.2.1.1 (U//FOUO) Future Information Storage MAA Development

(U//FOUO) The USIGS Information Storage of the future will be composed of federated systems operating in a collaborative environment to provide accurate and timely USIGS data to support the operational needs of combatant forces, and of DoD and national decision-makers. Under the future NIMA Integrated Information Library (NIIL) concept, USIGS Information Storage will include a networked series of distributed libraries, allowing multiple points of input and access, and will provide the backbone for dissemination of USIGS data. Permanent archives for long-term information retention will supplement these USIGS libraries. IGC members will be able to pull information from the libraries by information mining on the topic of their choice through universally accessible global and local catalog capabilities. If the information is not available, they can then request a requirement to be satisfied via the Information Management (tasking) element. Users of the USIGS will provide standing queries and standing orders to have USIGS data and related information of potential interest delivered to the desktop. *Ad hoc* search and retrieval requests will be supported through local and global catalog capabilities.

2.2.2 (U//FOUO) Information Discovery and Retrieval (ID&R) MAA Migration

(U//FOUO) ID&R will provide software to allow users to access imagery, imagery intelligence and geospatial information from the NL. ID&R consists of two related elements: the information infrastructure needed to relate and reference disparate information and the discovery and retrieval capabilities to provide browse/query and retrieval of USIGS information. Figure 2-3 is the functional evolution diagram for the ID&R MAA.
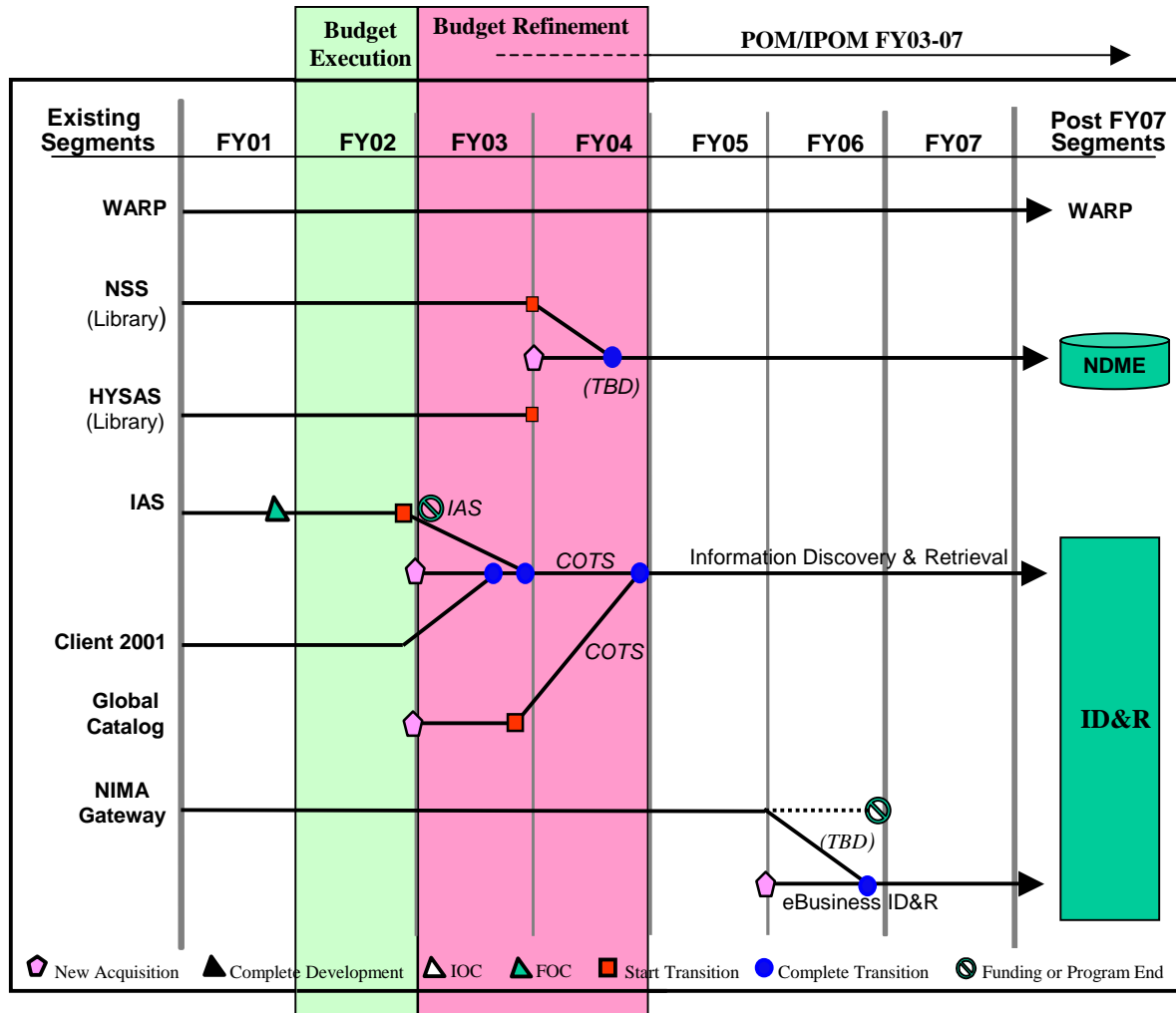
Figure 2-3 (U//FOUO) Information Discovery and Retrieval Functional Evolution Diagram

(U//FOUO) Mechanisms will be provided to query USIGS data holdings in current storage, archives, the SRDB, and distributed databases. The Information Access Services Common Client (IAS CC) software will provide web query access to imagery intelligence and geospatial data contained in NIMA libraries.

2.2.2.1 (U//FOUO) Future Information Discovery and Retrieval MAA Development

(U//FOUO) The future ID&R MAA will be built upon the current IAS. IAS will be integrated with the MCGIL, and new versions of the library software. As a result of this integration, NIMA will be able to deploy an integrated library environment to both external and internal users, with IAS providing customers distributed access to heterogeneous libraries and holdings that are part of the NIMA enterprise.

(U//FOUO) Another move forward planned for IAS will be extension of the depth of access into the content level. Content-level access will allow users to select the information necessary at the feature, point or frame level, rather than at the product level. The infrastructure now in place in IAS is positioned to support content-level access.

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2.2.3 (U//FOUO) Information Delivery MAA Migration

(U//FOUO) The Information Delivery MAA category consists of software applications for delivery of imagery, imagery intelligence, and geospatial information to the NL and for the dissemination of stored information from the libraries.   Services performed within the scope of information delivery include information processing, staging, transmission, interest profile, order integration, operations (receive systems) and delivery resource management. Figure 2-4 is the functional evolution diagram for the Information Delivery MAA.
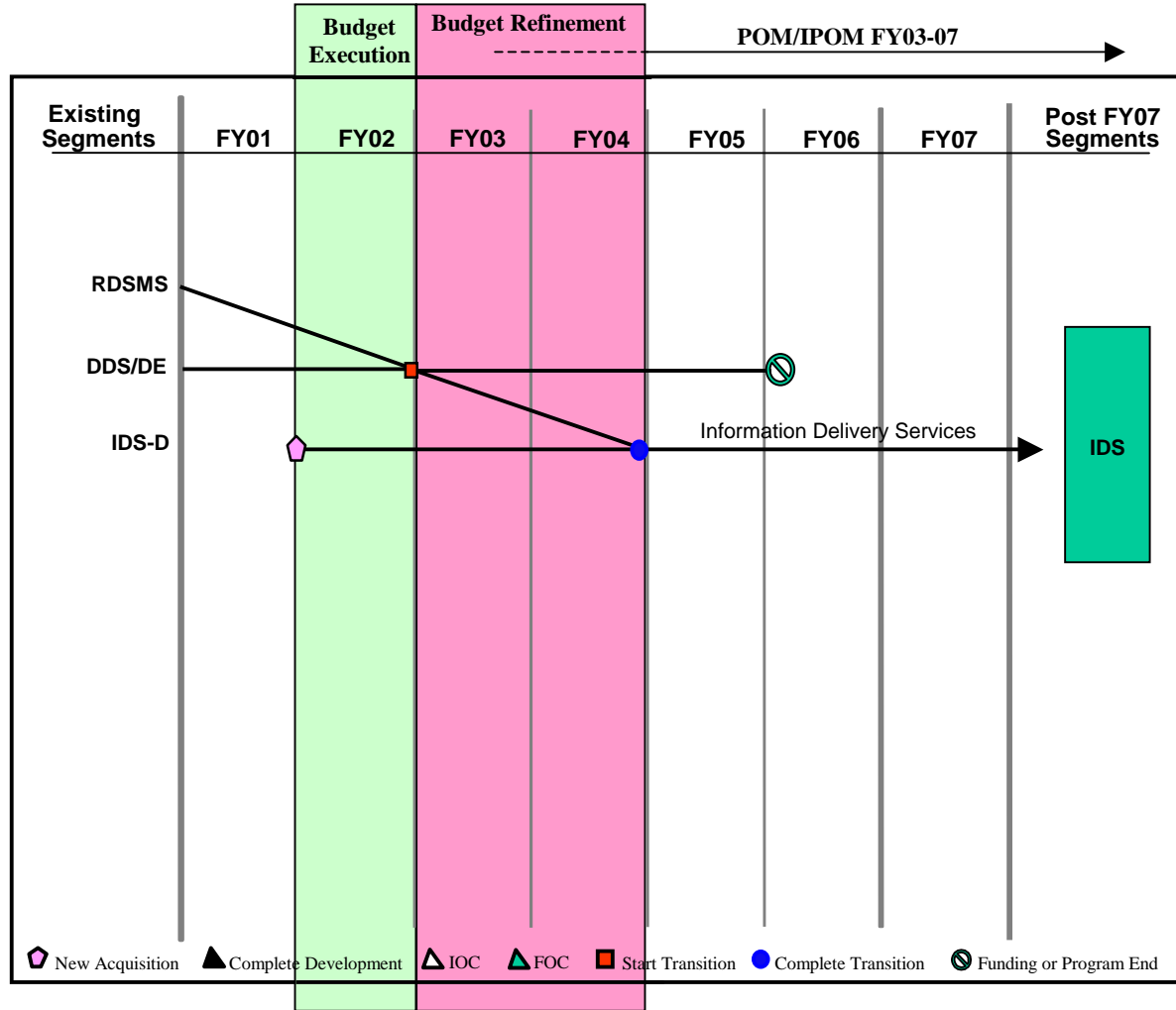
Figure 2-4 (U//FOUO) Information Delivery Functional Evolution Diagram

(U//FOUO) Information Delivery operates in tandem with the Information Storage and D&R request functions to provide the following capabilities:

- USIGS data input, including providing new information to users according to tasking and personalized standing queries and orders.
- User-driven discovery and retrieval of data cataloged in the libraries.
- Softcopy information delivery of data (possibly with conversion or size reduction) to users.
- Hardcopy and media production and physical delivery.

(U//FOUO) Information Delivery services enable the delivery of imagery from various provider sources (e.g. national, theater, tactical, commercial), imagery intelligence, and geospatial information to a user's library of choice, at the lowest security classification possible. It provides for development and COTS integration of platform-independent software solutions enabling the migration of legacy DDS/DE imagery delivery capabilities within USIGS.

(U//FOUO) USIGS relies primarily on the Defense Information System Network (DISN) for communications services, and a variety of theater and tactical communications systems for interconnecting users with libraries. Information Delivery services will provide electronic transfer of USIGS data among storage repositories (libraries) and direct dissemination communications from an input point to selected user facilities.

(U//FOUO) Certain high-priority imagery and imagery data must be quickly delivered to end users and libraries. This data will be identified and passed to the softcopy Information Delivery Service. USIGS will provide high-performance direct dissemination communications linking the National Technical Means (NTM) input capability with selected military commands and other key intelligence community organizations.

(U//FOUO) Geospatial imagery information is collected in large coverage areas (rectangles) placed on Digital Data Cassette (D2C) tape, and sent to NIMA/GI for exploitation. Geospatial imagery is inputed via the Data Services Segment (DS/S), Image Data Controller - Type A (IDC-A) subsystem of the legacy Digital Production System (DPS), disseminated, and then exploited for NIMA map and chart production. The geospatial information extracted from the imagery (feature and elevation data) is also retained in the MC&G database portion of the Feature Level Database (FLDB). Several other databases in Production Management Segment (PM/S), DS/S, and Source Acquisition Segment (SA/S) provide requisite support information for accurately exploiting GI imagery and performing geospatial production tasks using non-NIMA systems. DS/S will be maintained into FY03; its geospatial functionality will migrate to MCGIL.

(U//FOUO) USIGS will also provide a standing query and order capability by which newly received information is automatically forwarded to users if the new information matches previously-specified characteristics. A standing query is one that is run repeatedly for a set period of time rather than simply once and returns metadata about the information found. A standing order is a request to have a product delivered from a library to in a specific form until the order lifetime expires. These are described as profiles in NIMA architecture documents.

(U//FOUO) USIGS will permit users to specify and update their personal standing query or standing order area of interest (metadata). The standing query or order capability will permit the administrator of a USIGS current library to establish a standing query or order for the library, so that a copy of specified types of information is automatically migrated from a source to the library. This capability will provide both load leveling and expedite the movement of information to managers and users.

2.2.3.1 (U//FOUO) Future Information Delivery MAA Development

U//FOUO) IDS-Direct Delivery (IDS-D) is being developed by NIMA in response to Intelligence Program Decision Memorandum (IPDM) II direction to implement Enhanced Processing Segment (EPS) functionality in the USIGS architecture, and as a key enabler of the USIGS Operational Requirements Document (ORD)

requirement for time-dominant dissemination of NTM data. IDS-D is a direct replacement for the EPS and the delivery component of the DDS for dissemination of near real time and time dominant imagery. IDS-D will meet or exceed the current EPS specification.

2.2.4 (U//FOUO) Information Reproduction and Replication (IR&R) MAA Migration

(U//FOUO) The IR&R MAA category will consist of equipment, processes, and scaleable software applications that allow customers to convert digital imagery, imagery intelligence, and geospatial information to hardcopy or transportable electronic media (tape, CD, etc.). IR&R will deliver hardware-independent software solutions for data reproduction and replication. These will utilize COTS hardware/software and develop application interfaces when necessary to integrate and replace the current Remote Replication System (RRS) and the Defense Dissemination System (DDS) Hardcopy Reconstruction Unit (HRU) functionality. The IR&R MAA will use COTS software solutions whenever possible. Figure 2-5 is the functional evolution diagram for the IR&R MAA.
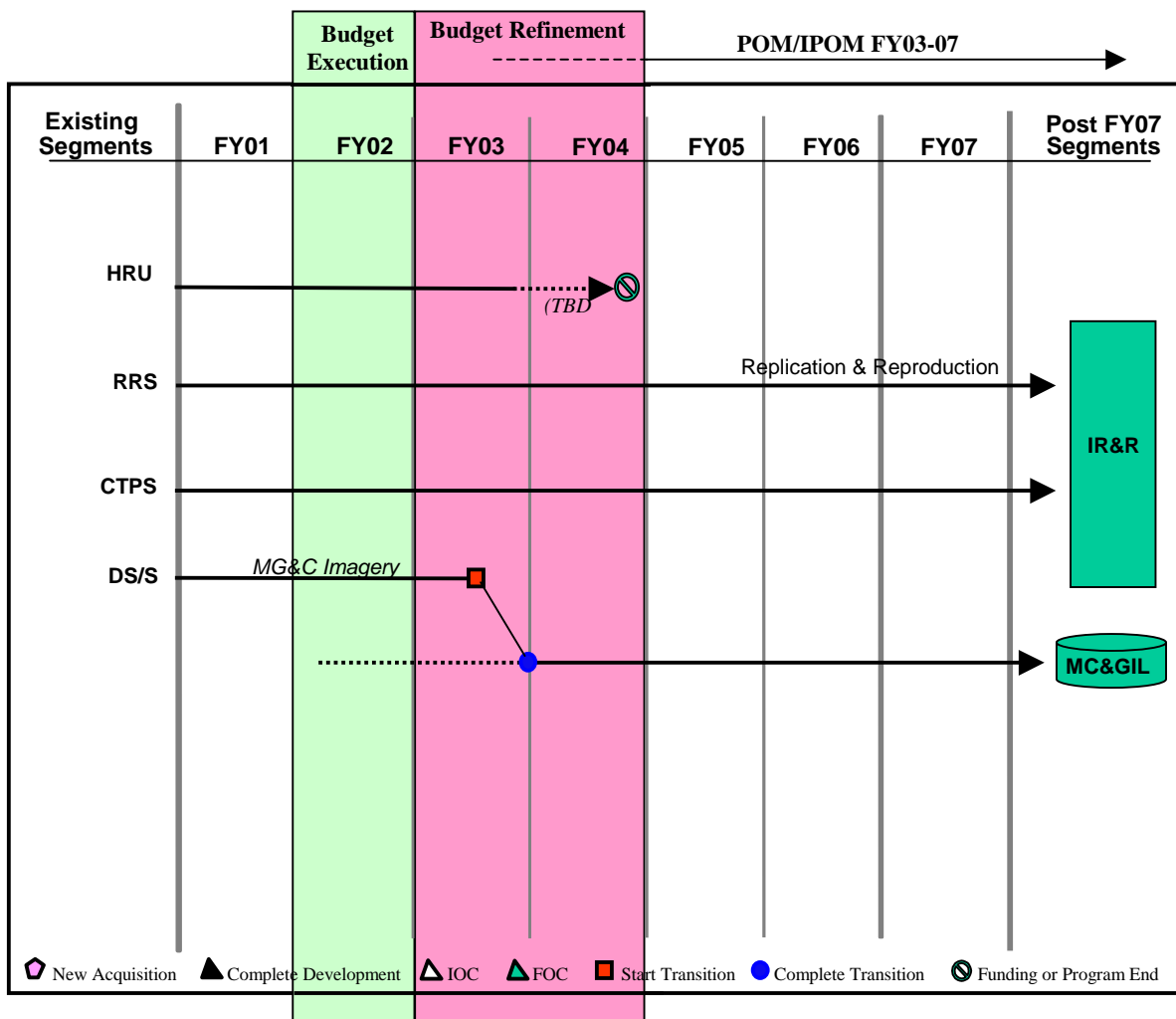
Figure 2-5 (U//FOUO) Information R&R Functional Evolution Diagram

(U//FOUO) IR&R provides functionality necessary to allow customers to convert digital imagery, imagery intelligence, and geospatial information to hardcopy or transportable electronic media.   Functionality requirements include:

- A capability to print and plot products in USIGS-compliant formats from the common softcopy environment.
- Assurance that any current library will be capable of producing USIGS Interoperability Profile (UIP)-compliant removable computer-readable media containing any of the USIGS data stored in the libraries.
- Provision of a remote, low-volume imagery film production capability that can be driven by information from a USIGS library.
- Provision of a remote hardcopy map replication capability that can be driven by information from a USIGS library.
- Provision for reproduction capability for high-volume, quick-turnaround production of printed materials of 200 or more copies.

2.2.4.1 (U//FOUO) Information Reproduction and Replication (IR&R) Systems

(U//FOUO) NIMA maintains a number of specialized systems that output softcopy information on a variety of different media. The Hardcopy Reconstruction Unit (HRU) is a custom-developed hardware component of the DE that produces high-resolution film products from softcopy imagery. These film products, produced using a custom dry process film media, are exploitable on a light table. There are currently eight HRU systems, fielded at various commands through the DDS program. These devices will be phased out by FY02 and replaced.

(U//FOUO) The Tape Duplication System (TDS) is a COTS-based system operated by NIMA.   TDS reproduces digital tapes on a variety of media types (e.g., 8mm, D2C) for a variety of purposes.

(U//FOUO) The Remote Replication System (RRS) is a COTS-based system that reproduces hardcopy maps/charts in limited quantities, and print hardcopy from digital map/chart files. It includes a communications interface enabling electronic receipt of digital map/chart information.

(U//FOUO) The Computer to Plate System (CTPS) is a COTS-based system also operated by NIMA that supports NIMA's hardcopy map/chart printing program. It receives data digitally or via scanned hardcopy, converts it to a print-ready format, and produces a press plate used in the lithographic printing process. Softcopy files are retained in archive storage on the CTPS for future map/chart printing/update purposes.

2.2.4.2 (U//FOUO) Future Information Reproduction & Replication (IR&R) Development

(U//FOUO) The future IR&R MAA category will leverage COTS hardware devices that enable output of USIGS data (imagery and geospatial) on a variety of media. These will be capable of interfacing with USIGS libraries (NIL/CIL/IPL) and compatible, commercial-source data libraries.

(U//FOUO) Software development for the IR&R MAA category would be limited to formatting/converting USIGS data sets into standard output formats (e.g., Tagged Image File Format (TIFF), Postscript, and National Imagery Transmission Format (NITF)).   Continued market surveys will be conducted to build a ready requirements data set available for development and identification of COTS solutions for the IR&R MAA beginning early in the FYDP.

(U//FOUO) The legacy RRS and HRU will be supported in a sustainment mode. NIMA will identify a suitable commercial replacement, but customers will be responsible for procurement funds to replace the HRU. NIMA will provide procurement funds for replacing the RRS at customer sites.

(U//FOUO) For CTPS, funding is programmed for additional storage, hardware recapitalization, and sustaining maintenance over the FYDP.

2.3 Exploitation Element Overview

(U//FOUO) The USIGS Exploitation Element provides the capabilities for imagery intelligence and geospatial information display and preparation information evaluation and validation, exploitation, extraction, integration, and information generation and product finishing. The Exploitation Element provides an integrated exploitation environment that will maximize the use of COTS hardware and software to support customer needs. It also provides a family of commercial softcopy tools and workstations that will be distributed to imagery intelligence and geospatial workgroups. The Exploitation Element allows USIGS customers to generate new imagery intelligence and geospatial information and products. To support the planning process, the Exploitation Element provides services for internally managing assets (e.g., personnel and equipment), tracking production task status, assembling work packages, and supporting other workflow management. To facilitate execution of assigned information generation tasks, the Exploitation Element provides services to manipulate, analyze, and fuse information from various sources to create new imagery intelligence and new geospatial information and products within a collaborative environment.

(U//FOUO) A virtual work environment is envisioned for the IGC based upon an interoperable, re-configurable desktop that enables real-time, interactive collaboration. Imagery and geospatial data will be displayed in static and/or dynamic scenarios, and permit three-dimensional information visualization to support analysis and operational requirements. Completed job/task assignments for data production are stored and disseminated to customers. Software tools will enable the fusion of imagery and geospatial information with operational and environmental data to provide comprehensive mission and intelligence analysis, planning, and execution. Value-added data resulting from end-user processes will be captured, validated, and stored back to the appropriate NL.

(U//FOUO) The Exploitation Element will integrate selected legacy system functionality with newly developed functional capabilities to field the following four MAA categories: Data Preparation, Data Exploitation, Information Generation, and Exploitation Support. The USIGS exploitation evolution diagrams shown in Figures 4-1, 4-2, 4-3, and 4-4 depict the mapping of legacy and new capabilities to these MAAs. Note that several of the legacy systems map to multiple MAAs, and the IEC maps to all four MAAs.

(U//FOUO) The USIGS Exploitation Evolution Diagrams depict planned migrations for Exploitation systems through FY07. Because a single end-to-end legacy system may perform a variety of functions, it may be shown converging into more than one MAA category on the evolution diagrams. For example, the primary function of Navigation Safety System (NSS) is data exploitation to maintain the navigation feature layer of the Master Seafloor Digital Database. However, NSS also creates digital text and graphic products, such as NTM, which is an information generation function. In this case, functionality within NSS will migrate to each of these MAA categories. It should be noted that the major evolution focus is to migrate from custom legacy systems to functional capabilities offered through use of COTS products. For example, the preferred NIMA solution is the migration of legacy exploitation software and hardware to the IEC, which is predominately COTS.

(U//FOUO) The IEC is the migration platform for the exploitation element. The IEC will replace the IDEX II sites across the IGC. The National Imagery Exploitation System (NIES) Project facilitates the replacement of the custom IDEX II workstations with IEC workstations, and the IDEX II storage, archive and dissemination capability with the CILs and NIMA libraries. The IEC integrates USIGS softcopy imagery exploitation and information production capabilities within the IGC. The IEC suite of hardware and software, delivered via spiral development/design and based primarily on COTS products, will support NIMA imagery and GI analysts and selected non-NIMA imagery analysts. The IEC will include a comprehensive suite of workstations, servers, tools, applications, and intra-workgroup communications tools. The IEC deliveries will satisfy a community-

wide IDEX II workstation replacement requirement (part of the IDEX II Replacement Program (IRP)), augment imagery analytical production capabilities at many DoD sites, and replace parts of the DPS. The IEC is the exploitation component of USIGS and its architecture will be compliant with USIGS standards.

(U//FOUO) The IEC workstations delivered to the WNY interface with the IDEX II archive via the Tile Broker Tool until their migration to NIMA Bethesda as part of the NIMA WNY closure. This installation of IEC workstations into the existing legacy environment at WNY provides NIMA the opportunity to identify transition issues and concerns that will impact migration to IEC suites within NIMA and across the IGC. For example, changes to the communications infrastructure will be addressed during the transition from a mixed IDEX II and IEC environment to the target IEC workgroup environment.

(U//FOUO) Most Data Preparation, Data Exploitation, and Information Generation functions will ultimately be migrated to or replaced by the IEC platform, which is the migration vehicle for consolidating and integrating functions within the MAAs.

2.3.1 Data Preparation MAA

(U//FOUO) The Data Preparation MAA category determines what imagery and supporting information is required to execute a specific exploitation task. Data preparation initiates the appropriate actions to obtain the necessary primary and collateral material from internal and external sources. The retrieved information is evaluated for content, quality and completeness and is assembled into work packages for delivery to exploitation workgroups. Data Preparation may involve pre-fetch activities through management of tasking and collection of imagery for IEC and other exploitation processing. Delivery of imagery and associated data may be staged to an individual analyst, static or virtual workgroup based on a unique or ad hoc profile for the topic or area the analyst, or workgroup may be exploiting.

(U//FOUO) Fundamental preparation of geospatial image data is performed by Segment 18. In addition, certain classes of sources require unique processing or preparation in order to be exploited by a standard set of tools. The Geodetic Data Applications System II (GDAS II) and Digital Geodetic Support System (DGSS) provide specific parameters for exploitation of hardcopy maps and charts, while IEC, Target Management System (TMS), and Front-end Processing Environment (FPE) provide support data for imagery exploitation. The Hydrographic Source Assessment System (HYSAS) and Navigation Safety System (NSS) provides this function for a variety of digital sounding sources.

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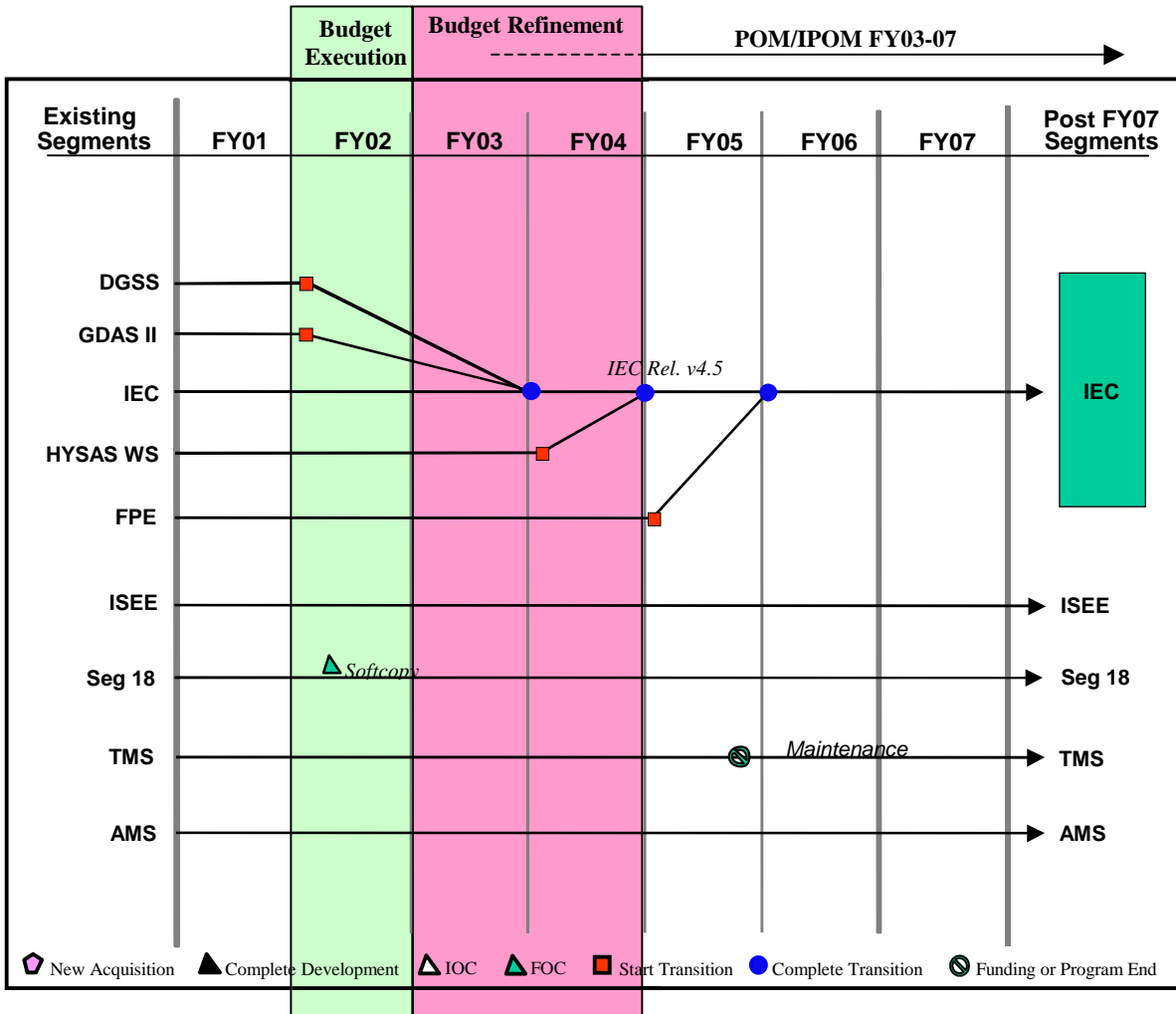
Figure 2-6 (U//FOUO) Data Preparation Evolution Diagram

2.3.2 Data Exploitation MAA

(U//FOUO) The Data Exploitation MAA category accepts work package assembled data and provides the capabilities to perform the necessary analysis in accordance with the information need specified in the exploitation requirement. Data Exploitation employs a suite of intelligence and geospatial imagery analysis, information extraction, and information validation tools to support the extraction of imagery intelligence and/or geospatial information from imagery, topographic, hydrographic, geodetic and aeronautical sources.

(U//FOUO) Data Exploitation covers many different tools and systems in use to collect information from a variety of sources stored in various USIGS Archive and Dissemination and legacy assets. Some of the differences in the legacy systems are driven by physical characteristics of the sources and will remain as distinct functions in the future architecture.

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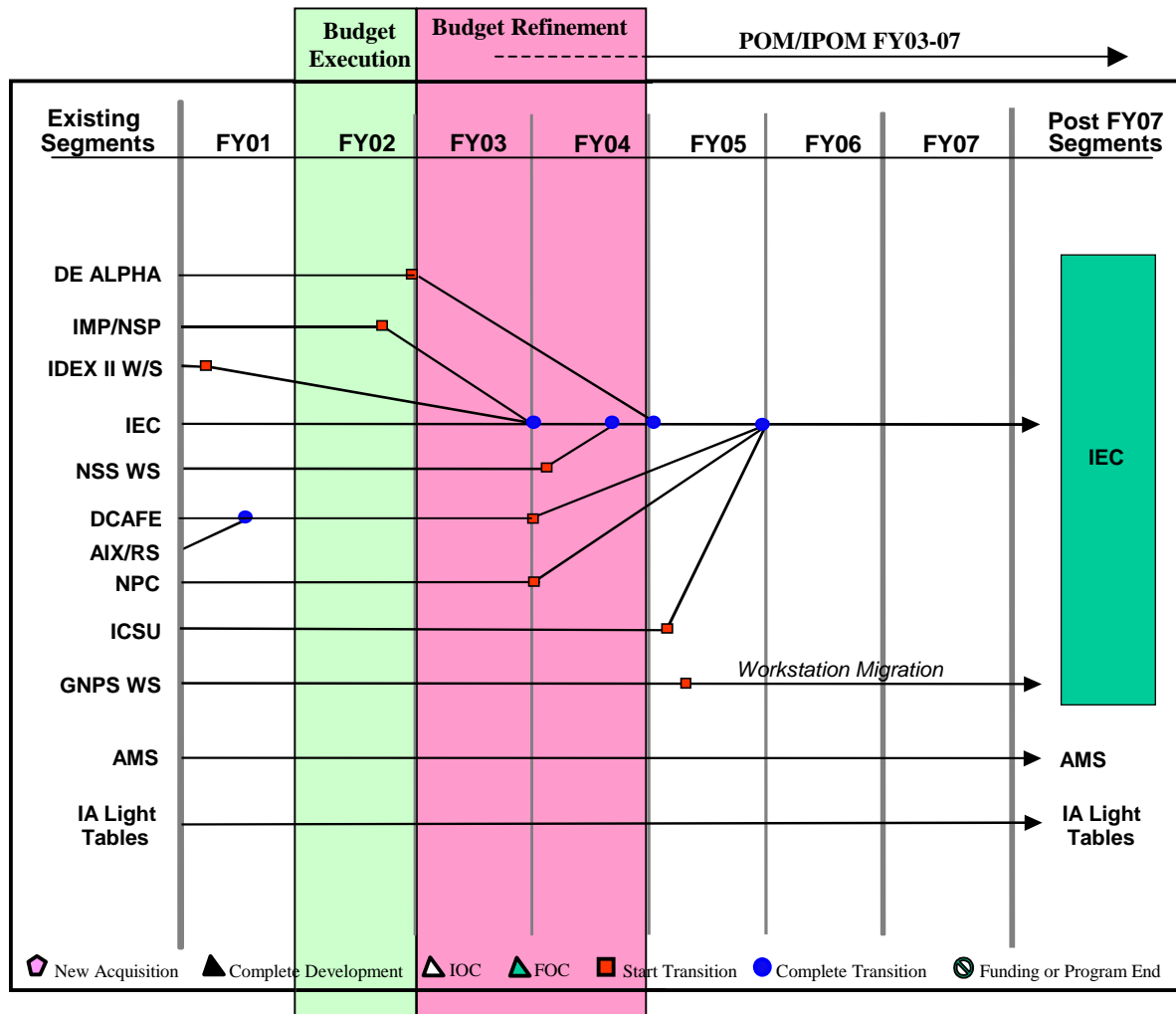
Figure 2-7 (U//FOUO) Data Exploitation Evolution Diagram

(U//FOUO) Monoscopic imagery extraction for geospatial production is performed on the NIMA Production Cell (NPC), AIX/Revision Segment, DCAFE, and the Aeronautical Migration System (AMS). For geospatial production, DE Alpha, NPC, and IEC provide stereo imagery extraction. For imagery intelligence production, IDEX II and IEC provide both stereo and mono softcopy exploitation capabilities. RainDrop software provides extraction from DPPDB. All of these processes use similar algorithms that can be bundled while still allowing for the physical distinctions in the sources–particularly since new tools are being added (in FPE) to digitize hardcopy imagery and to produce DPPDBs and CIB. As these capabilities are bundled, the functions will be housed on the IEC as the generic image exploitation platform. Although not explicitly shown in the convergence diagram, IEC will also provide the capability to output geospatial feature data exploited from rasterized hardcopy maps and charts in the same formats as imagery extracted feature data. Geographic Names Processing System (GNPS) and NSS exploit other data sources for location names information and Notice to Mariners information. Also, note that some text report and exploitation functions reside on the IESS and NES segments. As the USIGS rebaseline deferred the planned migration of those functions to the exploitation

element outside of the timeframe covered in this plan, those segments are detailed in the information management element.

2.3.3 Information Generation MAA

(U//FOUO) The Information Generation MAA category produces the final product resulting from an exploitation activity, and includes the preparation of imagery intelligence and geospatial information in customer specified format. Included within the Information Generation MAA category is a validation activity that serves as the product quality control for exploitation.

(U//FOUO) Information Generation functions are found on systems that produce geospatial products. ARC Digitized Raster Graphics (ADRG) Common Mapping Production System (CMPS), Compressed Aeronautical Chart (CAC) production system, and Point Positioning Production System (PPPS) produce both image and map raster products. Interactive Quality Review Systems (IQRS), DCAFE, and DE Alpha produce digital elevation products.   DCAFE, Vector Product Format/Production System (VPF/PS), Interactive Compilation System Upgrade (ICSU) and Alternate Imagery Exploitation/Revision System (AIX/RS) produce hardcopy maps and charts as well as vector format maps and charts. Although some unique characteristics remain for the products and datasets, the tools to finish data are largely the same. For example, finishing to a MIL-SPEC for a paper map or VPF CD-ROM, and finishing to populate a finished layer in a database, include unique characteristics but utilize similar finishing tools. Information Generation functions also include imagery analysis and product finishing currently performed on multiple stand-alone intelligence
Analyst systems located at the WNY.
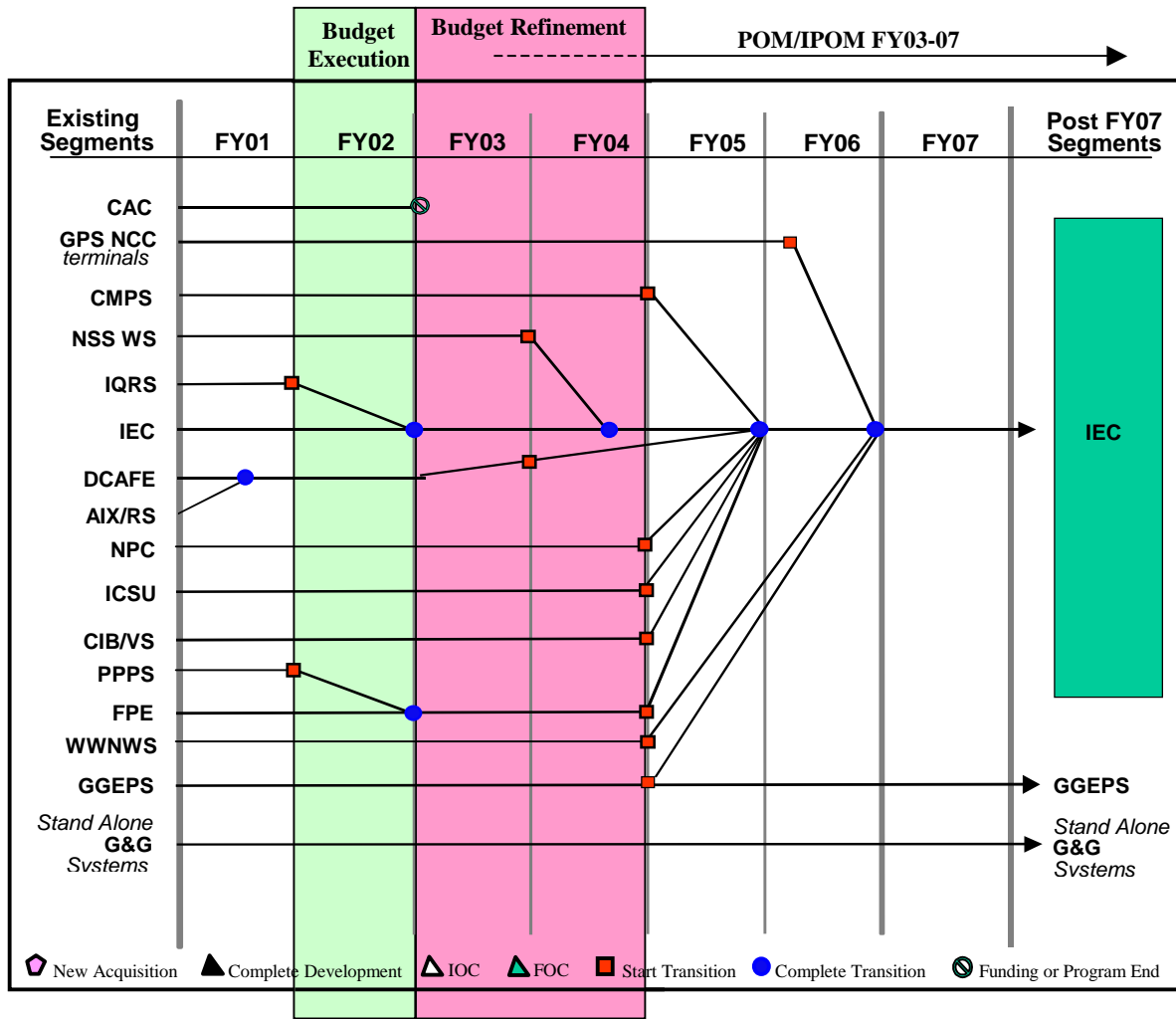
Figure 2-8 (U//FOUO) Information Generation Evolution Diagram

2.3.4 Exploitation Support MAA

(U//FOUO) The Exploitation Support MAA category accepts exploitation tasking from the Information Management Element, evaluates the feasibility of the received tasking, estimates the resources required to accomplish the task, and provides the capabilities to manage completion of the task during the production cycle. It establishes the schedule for a particular task, sets the priority, and allocates the task to a workgroup whose members work as a team on a special topic. Exploitation Support maintains the status of tasks during execution and provides status to the Information Management Element. It also controls the flow of imagery and imagery-related data into, within, and out of the Exploitation Element. User profiles support the rapid delivery of imagery and imagery-related data to analysts, and to workgroups for exploitation tasks. Exploitation Support initiates input of imagery and other data from libraries and/or directs dissemination to route received data to local storage. It provides precision display and manipulation capabilities for imagery and geospatial data. Exploitation Support maintains catalogs of all private holdings within the Exploitation Element, including both electronic and physical products. Exploitation Support manages the conversion of media within the Exploitation Element from/to electronic and physical media and initiates delivery of products to the Archive and Dissemination Element for subsequent dissemination to end-users.

(U//FOUO) The Exploitation Support MAA category covers development and sustainment of unique exploitation tools, as well as the migration from existing legacy software tools to new software packages and functionality in direct support of the Warfighter and intelligence community. Joint Mapping Tool Kit (JMTK), Ruler, Joint Targeting Workstation (JTW), Common Architecture Support Services (CASS), Multi-image Exploitation Toolkit (MET) and MATRIX all represent suites of tools that provide basic image display, format, annotation, geolocation, and measurement capabilities. Large Area Softcopy Exploitation Resource (LASER), large area search technology insertion, EXPIRT and National Imagery Derived Products (NIDP) are specialized software exploitation tools. Both MET and MATRIX are planned to be sustained until their functionality can be replaced by new COTS products, estimated to be available by FY04.
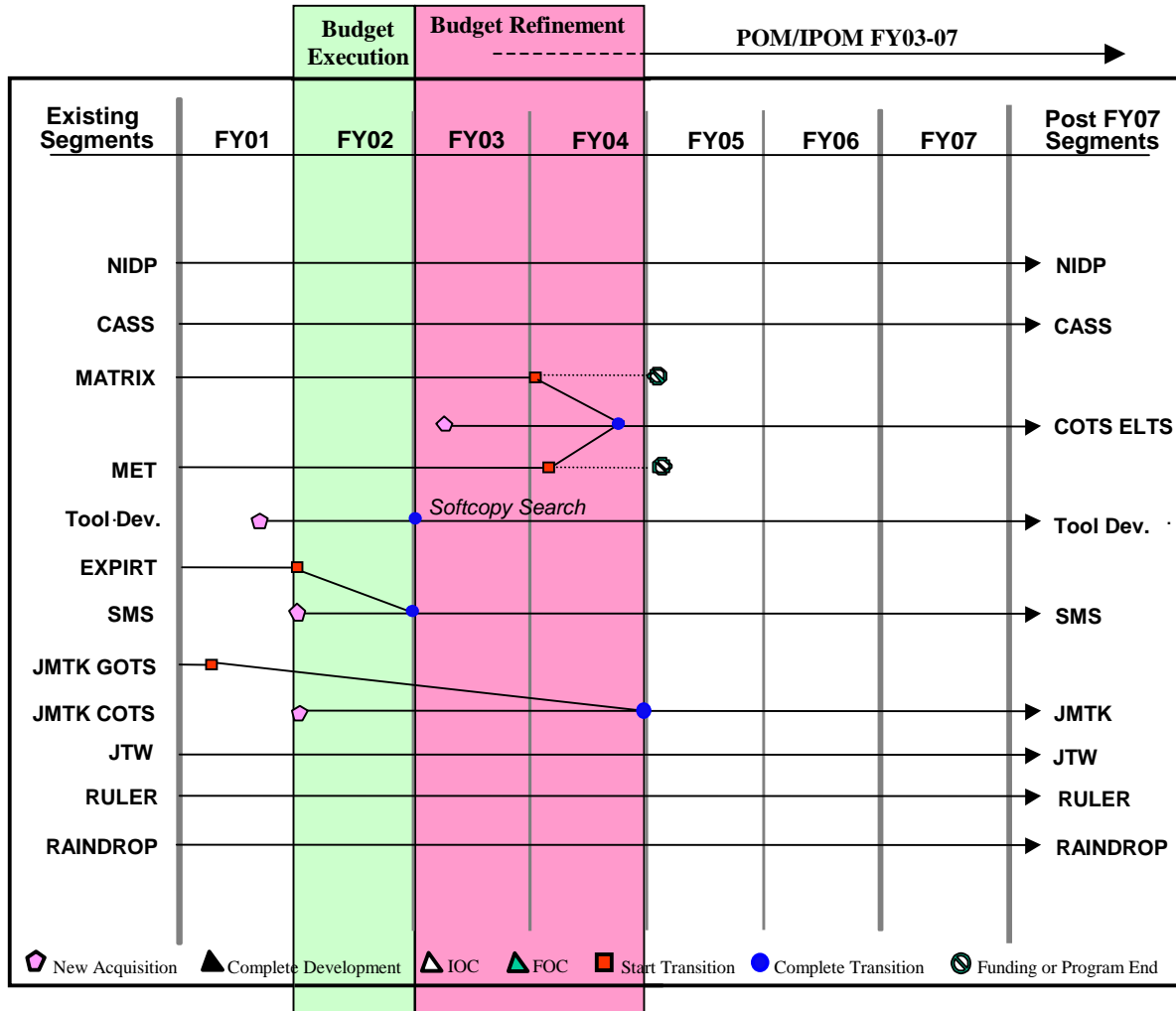
Figure 2-9 (U//FOUO) Exploitation Support Evolution Diagram

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(U//FOUO) SECTION 3

YEARLY MIGRATION SUMMARIES

(U//FOUO) This section presents an outline description of each the USIGS migration fiscal years, throughout the FYDP. It begins with a review of FY01 migration activity for context. As with the previous section, discussion is focused on each of the Execution and/or Budget Years (FY02-03), with internal text presented by USIGS Element. The Planning Years (FY04-07) are aggregated.

3.1 (U//FOUO) FY01 Migration Review

(U//FOUO) Legacy migration was the primary focus of the USIGS migration throughout FY01. This included the continuing National Imagery Exploitation System (NIES) project and completion of some projects started in FY00. Upgrades were provided for the Enhanced Imaging System (EIS) formats and exploitation capability expanded. EIS upgrades to SA/S were also in development. Longer-term architectural element developments started in FY00 continued through FY01 as a precursor to the additional efforts starting in FY02 or later.

(U//FOUO) The Demand Driven Direct Digital Dissemination (5D) to Image Product Libraries (IPLs) migration will be completed in FY02. The 5D replacement will be completed with the deliveries of the IPLs to the last of the 5D sites (EUCOM and PACOM) and their 5D's will be deactivated. The IPLs will provide the storage and functionality previously provided by the 5D, as well as additional storage and functions to support additional sites. The IPLs will be updated through the FYDP to support USIGS import, storage and access requirements.

(U//FOUO) NIES deployments continued in FY01. While the capabilities will be replaced, the number of Command Information Libraries (CILs) and the actual library architecture will change based upon USIGS re-baseline decisions.

(U//FOUO) Feature Level Database (FLDB) development began in FY01.

(U//FOUO) A review of FY01 migration activities by USIGS Element follows.

3.1.1 (U//FOUO) Information Management Migration in FY01

(U//FOUO) The primary migration activities within Information Management in FY01 were as follows:

- The start of the migration to Workflow Management (WFM) and Order Entry Tracking (OET), originally scheduled to begin in FY01, was deferred five years to allow technology and the NIMA budget to mature. This USIGS rebaseline action results in the extension of the legacy Information Management systems, and perturbs the migration path of all of the USIGS systems.
- The Requirements Management System (RMS) continued as the tasking system for national collection assets. The RMS Site re-architecture was initiated to optimize (reduce) the RMS Site Baseline. Reducing the site baseline simplifies system management. Planned community-wide collection management improvements have capabilities to facilitate decentralized execution. The RMS Release 7.0 software upgrade (supports EIS) was installed worldwide, remote system and security administration is supported for all distributed sites, and the RMS help desk is staffed 24/7.
- The Imagery Exploitation Support System (IESS) continued delivery of the Enhanced Analyst Client (EAC) Version 1.0 as part of the NIES Project. The EAC interfaces to the NIMA Libraries (NL) and Integrated Exploitation Capability (IEC) via the USIGS Interoperability Profile (UIP) to provide automated analyst-centric exploitation management capabilities and ensure continued support to sites during the transition effort. IESS Version 4.0 provided the baseline capability for EIS, Version 4.1 provides support to EIS Broad Area Search (BAS) imagery exploitation and Version 4.2 upgrades

IESS/EAC in support of USIGS migration and community user needs. In addition, EIS upgrades to FPE and DE-Alpha continued in development.

- The NIMA Exploitation System (NES) continued UIP development to support interfaces with the IEC and NIMA Library softcopy exploitation environment. NES provides interfaces to NIMA Libraries and IEC workstations and tools at NIMA sites. Remote imagery coverage plots was supported at non-NIMA sites and access is expanded via an INTELINK interface.
- Production Management Alternate Architecture (PMAA) completed geospatial workflow management functional replacement.
- Modifications for RMS, NES, and IESS to support FIA began.

3.1.2 (U//FOUO) Archive and Dissemination Migration in FY01

(U//FOUO) The primary migration activities within Archive and Dissemination in FY01 were as follows:

- Deploy 184 IPL hardware and software suites.
- The Common Imagery Ground/Surface System/Distributed Common Ground System-Imagery (CIGSS/ DCGS-I) IPL continued deployment. NIMA will continue to procure new IPL hardware systems, integrate IPL on the new hardware at sites, install IPL on previously procured systems at additional sites and provide Operations & Maintenance (O&M) support for all installed IPLs at CIGSS/DCGS locations.
- IPL deployments to Joint Task Force (JTF) and below continued during this period. NIMA will provide O&M support, procurement of non-CIGSS/DCGS IPLs, configuration and integration support at the sites, and training.
- NIMA will continue to provide software maintenance, help desk support, data replication tool development, and replicate legacy data from 5D to IPL.
- IOC for the SCI NIL. Communications capabilities will increase for processed data at the deployed National Information Library (NIL) during this period. This will provide faster access to the long-term archive of national imagery and selected other historical intelligence information. See Appendix E for further details regarding communications.
- EIS upgrades for the IPL, NIL and MC&G Information Library (MCGIL) occurred during this period to handle new data types and increased amounts of data.
- Installation of CILs at JFCOM, CENTCOM, EUCOM, PACOM, and STRATCOM occurred during this period.
- Deploy MCGIL as part of the MC&G Information Flow (MCGIF) project. Development of IEC MG&C capabilities to interface with MCGIL continued.
- Delivered Digital Product Data Warehouse (DPDW2) enhancements for electronic product access and additional product types.
- The Information Access Services (IAS) Common Client enhancements included incorporation of user comments, insertion of technology, direct access retrieval, and thumbnail performance improvements.
- Began EIS volume upgrades to NILs, CILs, and IPLs.
- Began information dissemination development. Specifically, DDS/DE migration to platform-independent solution and Enhanced Processing Segment (EPS) to NIL migration.

3.1.3 (U//FOUO) Exploitation Migration in FY01

(U//FOUO) The primary migration activities within Exploitation area in FY01 were as follows:

- The Imagery Data Exploitation System (IDEX II) workstation replacements continued.
- Additional IEC functionality and workstation seats were provided to NIMA.
- Tools sustainment and enhancements for critical new sources were provided. Ruler 12.0 will incorporates further EIS enhancements. Joint Mapping Toolkit (JMTK) Government Off The Shelf

(GOTS) version 4.2 adds geodetic model enhancements, interfaces to COTS relational data base software, interfaces to coordinate transformation software, and output, reporting and display improvements.

3.1.4 (U//FOUO) Communications Infrastructure Migration in FY01

(U//FOUO) The primary communications infrastructure activities in FY01 were as follows:

- The Digital Production System (DPS) WAN/LAN migration to asynchronous transfer mode (ATM) and local area coverage expanded.
- Completed WNY and other metro area network (MAN) site communication enhancements.
- Upgraded communications were planned for CIL at NAIC.
- A link was added between NIMA Reston and NIMA Arnold.
- The St. Louis-Reston link was removed.
- The St. Louis-Arnold link was upgraded, as will the Bethesda-St. Louis link.
- The Reston-Bethesda MAN link was upgraded.
- The Area -Bethesda MAN link was upgraded.
- Added SONET Links, between the SCI-NIL and CILs at PACOM and EUCOM, to the existing area links. Refer to Appendix E for details.
- Installed WAN Equipment at PACOM and EUCOM.

3.2 (U//FOUO) Execution Year (FY02) USIGS Program

(U//FOUO) A summary of FY02 migration activities by USIGS Element follows.

3.2.1 (U//FOUO) Information Management Migration in FY02

(U//FOUO) The primary migration activities within Information Management in FY02 are as follows:

- Development continues for RMS, IESS, and NES to support FIA.
- RMS expands web capabilities.
- The development of the Shared Requirements Database (SRDB) in support of EIS and FIA operations will begin. The SRDB will serve as the registry for imagery, imagery intelligence, and geospatial information needs and requirements.
- IOC for SA/S EIC capabilities.
- Other baseline IM components from FY01 (e.g., PMAA, RMS) continue.

3.2.2 (U//FOUO) Archive and Dissemination Migration in FY02

(U//FOUO) The primary migration activities within Archive and Dissemination in FY02 are as follows:

- IPL deployments continue and complete IPL replacement of 5Ds will occur during this period.
- Continue IDEX replacement CILs.
- The non-USIGS Warfighter Imagery Library at JWAC will evolve to a secret USIGS Warfighter Imagery Library (UWIL). The UWIL will have the same performance characteristics as other CILs but will be sized to accommodate 315 terabytes of information.
- Begin migration of DPS Data Services Segment (DS/S) imagery functions to MCGIL.
- CIL deployments at the NAIC and the 480th IG continue.
- Continue FLDB development.
- Continue to increase capacity and capability of NIL, CIL, and IPL for EIS.
- Commence information storage migration to platform-independent storage applications (from CILs, NIL, MCGIL, and DPDW).

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- 3.2.3 (U//FOUO) Exploitation Migration in FY02
- (U//FOUO) The primary migration activities within Exploitation area in FY02 are as follows.
- Begin migration of Geodetic Data Applications System (GDAS) II and Digital Geodetic Support System (DGSS) to IEC.
- IOC for FPE, DE-Alpha EIS capability, and IEC MG&C to MCGIL interface capability.
- Continue migration of legacy functions into Data Capture and Finishing Environment (DCAFE).

3.2.4 (U//FOUO) Communications Infrastructure Migration in FY02

(U//FOUO) The primary communications infrastructure activities in FY02 are as follows:

- Add and upgrade Optical Carrier 3 (OC 3) links to existing communications infrastructure.
- Complete NIMA LAN and WAN improvements to support geospatial environment (DPS network replacement, SCEN improvements).
- Upgrade communications planned for UWIL at JWAC.

3.3 (U//FOUO) Budget Year (FY03) USIGS Program

(U//FOUO) A summary of FY03 migration activities by USIGS Element follows.

3.3.1 (U//FOUO) Information Management Migration in FY03

(U//FOUO) The primary migration activities within Information Management in FY03 are as follows:

- Baseline IM components from FY01 (e.g. PMAA, RMS) continue.

3.3.2 (U//FOUO) Archive and Dissemination Migration in FY03

(U//FOUO) The primary migration activities within Archive and Dissemination in FY03 are as follows:

- IPL upgrades continue for support to USIGS elements.
- Continue to increase capacity and capability of NIL, CIL, and IPL for EIS.
- Deploy MC&G Database (DS/S replacement).
- Continue information storage migration to platform-independent storage applications.
- Continue information dissemination development; specifically, DDS/DE migration to platform independent solution and EPS to NIL migration.
- Continue development of NIMA Remote Replication System/Hardcopy Reconstruction Unit (RRS/HRU) software migration to new common COTs platform.
- Deliver the fully functional SCI NIL.
- Continue to deliver information delivery functionality (start Library-to-Library function).
- Begin development of a motion imagery library.

3.3.3 (U//FOUO) Exploitation Migration in FY03

(U//FOUO) The primary migration activities within Exploitation area in FY03 are as follows:

- Begin automation of Front-end Processing Environment (FPE) triangulation function, and DPPDB capability.
- Complete migration of Imagery Modernization Program (IMP), Interactive Compilation System Upgrade (ICSU), and Navigation Safety System (NSS) WS to IEC.
- Continue enhancement of exploitation tools capabilities.
- Begin to replace MATRIX and Multi-image Exploitation Toolkit (MET) capabilities with COTS.

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- Migrate Special Mensuration Services (SMS) capabilities.
- Complete migration of Interactive Compilation System Upgrade (ICSU) to Data Capture and Finishing Environment (DCAFE).

3.3.4 (U//FOUO) Communications Infrastructure Migration in FY03

(U//FOUO) The primary communications infrastructure activities in FY03 are as follows:

- Enhance NIMA St. Louis, WNY, and Area to common user access (e.g. JWICS, SIPRNET, and DATMS).
- Move SCI-NIL and CILs at 480th IG and NAIC from DS-3 links to OC-3 links installed in FY02.
- Move SCI-NIL and CILs at JFCOM, CENTCOM, and STRATCOM from 6Mbps links to OC-3 links installed in FY02
- Upgrade combined JWICS/SIPRNET/DATMS connectivity at Area to OC-12.

3.4 (U//FOUO) Planning Years (FY04-FY07) USIGS Program

(U//FOUO) The fiscal years beyond the Budget Years (FY02-03) represent migration objectives that are neither budgeted nor programmed. USIGS migration towards the fulfillment of UOSA objectives by 2010 direct the assumption of a continuing, logical enterprise-level migration path based on the Budget Year foundation. With some USIGS Projects or segments, the delivery/deployment schedules in the Planning Years are well established - CIL deployments to the Commands, for example. For many others, budget uncertainties and technology availability issues (among other factors) render the Planning Year milestones to be likely but imprecise estimates.

(U//FOUO) A summary of planning Years migration activities by USIGS Element follows.

3.4.1 (U//FOUO) Information Management Element

(U//FOUO) The primary Planning Years migration activities within Information Management Element are as follows:

- Baseline IM components from FY01 (e.g. PMAA, RMS) continue.
- Deliver SRDB.
- Begin planning for USIGS OET and WFM, with IOC subsequent to FY07.

3.4.2 (U//FOUO) Archive and Dissemination Element

(U//FOUO) The primary Planning Years migration activities within Archive and Dissemination Element are as follows:

- Continue upgrades to IPLs.
- CIL deployment continues to SOUTHCOM, SPACECOM, TRANSCOM, and other end users.
- Continue to increase capacity and capability of NIL, CIL, and IPL for EIS and FIA.
- Initiate S-NIL, and subsequent FOC.
- Continue information storage migration to platform independent storage applications.
- Continue information dissemination development; specifically, DDS/DE migration to platform independent solution and EPS to NIL migration.
- Continue development of NIMA RRS/HRU software migration to new common COTs platform.
- Begin development of a motion imagery library.
- Deliver a common COTS platform to perform replication and reproduction.
- Replace RRS at NIMA sites.
- Begin planning Phase I development of the NIIL.

- Continue NIMA Gateway migration into the Future Dissemination Architecture. See Appendix E.
- Complete information dissemination development during or subsequent to FY07.

3.4.3 (U//FOUO) Exploitation Element

(U//FOUO) The primary Planning Years migration activities within Exploitation Element are as follows:

- Complete migration of GDAS II and DGSS to IEC.
- Continue enhancement of exploitation tools capabilities.
- Begin to replace MATRIX and MET capabilities with COTS.
- Complete migration of DE Alpha to IEC.
- Begin IEC recapitalization, NT migration and enhanced functionality.
- Continue IEC recapitalization, NT migration and enhanced functionality.
- Complete replacement of DCAFE, TMS, NPC, and GNPS to establish a softcopy production environment within NIMA.
- Commence development of the NIMA Center of Excellence.

3.4.4 (U//FOUO) Communications Infrastructure Element

(U//FOUO) The primary Planning Years migration activities within the Communications Infrastructure Element are as follows:

- Continue to enhance NIMA St. Louis, WNY, and Area to common user access (e.g. JWICS, SIPRNET, and DATMS).
- Continue upgrade combined JWICS/SIPRNET/DATMS connectivity at St Louis and WNY to OC-3.
- Continue upgrade combined JWICS/SIPRNET/DATMS connectivity at Area to OC-12.
- Add NIMA OC-48 to MAN.
- Upgrade NIMA St. Louis OC-3 to OC-12 for common user access (e.g., JWICS, SIPRNET, DATMS).
- Upgrade NIMA Bethesda connectivity to St. Louis to OC-12.
- Upgrade Arnold connectivity to St. Louis to OC-12.
- See Appendix E for additional discussion.

(U//FOUO) Appendix A

USIGS Segments, Tools, and Functional Components

(U//FOUO) This appendix contains a concise functional description of and migration information for the USIGS segments, tools, and other functional components that are discussed in the preceding sections.

(U//FOUO) **Aeronautical Migration System (AMS).** The AMS is the environment within USIGS that collects, stores, maintains, and finishes aeronautical data, products, and services. The AMS contains seven sub-systems: Terminal Approach Production System (TAPS), Text Aeronautical Data System (TADS), Aeronautical Imagery Exploitation Environment (AIEE), Aeronautical Digital Data Environment (ADDE), Aeronautical Obstacle Environment (AOE), Aeronautical Source Environment (ASE) and Flight Information Publication (FLIP) Chart Production Environment (FCPE). Future capabilities for the FCPE subsystem will introduce object oriented technology into the FLIP publishing environment. The publishing capabilities currently fielded in TAPS, and TADS will be merged into a single object oriented publishing environment for FLIP text and FLIP graphics production. ASE and AOE currently run on their own separate databases. Future plans for the obstacle data and Chart Update Manual (CHUM) in AOE is to move toward a single database structure within ADDE. During FY02 AMS 2.0 will incorporate an IEC-friendly interface.

(U//FOUO) **Advanced Sensors.** Advanced Sensors performs product and metric assessment for primary source MC&G data, for the production of mapping support data in support of NIMA MC&G production. Advanced Sensors is currently modifying the capability to perform all functions based on softcopy data vice hardcopy film. The TPED IPDM directed NIMA to automate the assessment functions in FIA. Additional information can be found in Appendix E.

(U//FOUO) **Alternative Imagery Exploitation/Revision Segment (AIX/RS).** AIX/Revision Segment is a cutout from the old Vector Product Format (VPF/PS) Segment. AIX/RS performs monoscopic softcopy image exploitation, and produces hardcopy maps and charts, as well as vector format maps and charts and is currently in an O&M phase. This functionality along with DCAFE will migrate to the IEC suite of software by FY04.

(U//FOUO) **Client 2001.** Client 2001 is a browser into USIGS. Client 2001 is the upgrade to IAS CC and will provide a web-based interface to multiple NL users. Like IAS CC, Client 2001 will facilitate the dissemination of imagery, and imagery and geospatial products. Client 2001 will provide a global ID&R capability in common with the Command CILS, the IPLs, the MCGIL, and the WALA-are NIL and CILs.

(U//FOUO) **Command Information Library (CIL).** The CIL is a set of libraries storing imagery, imagery support data, imagery derived, and geospatial information tailored to a unique mission or geographic area. The CILs will be located at designated Unified Commands and exploitation centers. The respective organizations will manage access to and operate their CIL. Each user Command and Center will determine the data content of its CIL and identify which other organizations will have accesses to its library resources. CIL components provide imagery, geospatial information, and product storage mechanisms to allow users to query and discover the availability of data and products, and provide the tools to access and retrieve them. A CIL will:

- Provide for input of imagery source data from DEs. Catalog metadata from these source products to allow users to query, discover and order data that meets their needs.
- Provide for imagery format and compression conversions.
- Provide access controls to assure that query responses provided to users are consistent with their access privileges.
- Support client access to services via Universal Interoperability Profile (UIP)/Geospatial and Imagery Access Services (GIAS) interfaces to allow any compliant client to access the various services.

- Provide clients with information on the catalog structure to allow them to set up preferences for metadata query.
- Support full file retrievals and chip generation in response to user requests.
- Support input and cataloging of Reference Images for future discovery and retrieval**.**

(U//FOUO) The CIL supports USIGS interfaces defined in the Geospatial and Imagery Access Services (GIAS) as profiled in the UIP. The DE, EAC, IEC SVR and IAS CC invoke services from the library in accordance with these interfaces. The CIL provides the capability to input, store, catalog, convert, and export imagery and geospatial data. The CIL responds to client query requests with database query results, imagery overviews, or imagery. The CIL exports imagery data files, formatted and compressed by a variety of methods, as requested by clients, over the local networks or can provide data on media, if requested.

(U//FOUO) The CILs replace the existing legacy IDEX II central processing and archive functions at worldwide sites as part of NIES deployments. Imagery and geospatial information stored in the CIL will be accessible via the IAS Common Client/C2K1 and Enhanced Analyst Client (EAC). Initial CIL/NIES deliveries have been and will continue to be upgraded to provide increased capabilities and to support increased data requirements resulting from EIS and FIA. The libraries will be geographically dispersed, interconnected by electronic links, and will be sized to handle the USIGS data needed to fulfill specific missions. The DE will feed the CIL in a similar fashion to the IDEX II, although the interface will be the GIAS. Replacement of the IDEX II archives by the CIL began in FY00. As an interim stage in IDEX II archive replacement, the Open Primary Server (OPS) has replaced the IDEX II at some locations. Presently, therefore, the DE feeds the OPS in those locations. When the OPS is replaced by the CIL, the DE interface becomes the GIAS. As sites transition from IDEX II to NIES, IDEX II Operations and Maintenance (O&M) funding will transition to support NIMA library operations and maintenance**.**

(U//FOUO) **Commercial Satellite Imagery Library (CSIL).** The CSIL serves as the central repository within the DoD and IC for previous and newly purchased commercial and civil imagery. The CSIL was established to eliminate duplicative purchasing and to gain maximum benefit and distribution of purchased commercial imagery licensed to the DoD and IC. Within NIMA the Commercial Imagery Program office has overall responsibility for DoD commercial imagery purchasing. The library itself is operated by the DIA Office of Imagery Services (OIS), as executive agent for NIMA, but is transitioning to NIMA O&M by FY03. The CSIL currently has on-line access to over 23,000 commercial and civil satellite images. NIMA will assume all DIA OIS responsibilities and operations during FY03; the transfer target date is 1 October 2002. CSIL O&M, and OIS production and storage operations, along with appropriate personnel will be transferred. In addition to managing the CSIL, DIA OIS currently manages and operates the National Coverage Data File (NACDF), the imagery Digitization Request Services (DRS), and certain other imagery processing functions.

(U//FOUO) **Common Architecture Support Services (CASS).** CASS is a collection of software components that proceeds a framework of services, data, and structure definitions, libraries, and a well-defined API. CASS provides basic image exploitation functionality such as import, reduced resolution dataset generation, format conversion, image chipping capabilities, and file writing. The goal of CASS is to make new and existing image exploitation functions available to USIGS users and to eliminate duplication of effort in writing and maintaining the software. The CASS concept will allow software changes to be made efficiently and consistently to help ensure interoperability between separated IC users. CASS is composed of CORBA services (i.e. interfaces), C++ interfaces, and a collection of C libraries. The CORBA services in CASS are:

- Image Conversion Service
- Import Service
- Rendered Image Service
- Image Encoder Service
- Image Collection Service

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- Export Service

The Image Conversion Service is the management service, and it determines which requests go to a specific service.

(U//FOUO) The C Libraries contain the bulk of CASS functionality, and the CORBA services allow the client program to interact with the libraries without the requirement to understand the underlying library implementation architecture. The services are distributed and client programs can run them "on the run" on their host machines, or on different machines. Similarly, all services can be run on a single machine or distributed on several machines for the purpose of load balancing, resource access, or other purposes. A number of other USIGS programs are dependent upon CASS, including CIGSS, DCGS, IPL, NL, JTW, PTW, PTW-Plus, and Enhanced Precise Positioning Integrated Capability (EPPIC). CASS interfaces with Ruler through the Ruler API.

(U//FOUO) **Common Imagery Ground/Surface System/Distributed Common Ground System-Imagery (CIGSS/DCGS-I).** The objective of the CIGSS/DCGS-I is to migrate current military service ground systems to a family of networked, interoperable, scaleable, ground and afloat, mobile and fixed elements that receive, process, exploit and disseminate multi-source and multi-intelligence (SIGINT, IMINT, MASINT) information. Multi-source and multi-intelligence information is derived from airborne platforms and sensors, and commercial and national satellite sensors and other intelligence sources.

(U//FOUO) **Common Mapping Production System (CMPS), and Compressed Aeronautical Chart (CAC).** The CMPS is a joint USAF/NIMA system deployed in seven worldwide sites and used for the production of digitized Mapping, Charting, Geodesy, and Imagery (MCG&I) data and for mission planning, Theater Battle Management, Command, Control, Communications, Computers, and Intelligence (C^4I) and aircraft system support data production. The CMPS is a scalable system and will be utilized primarily for production of digitized raster maps, charts and imagery in standard NIMA formats. The source MCG&I data will consist of multiple formats on several medium types. The central CMPS (at NIMA) will process the data for distribution to the field on standard media, and the CMPS systems located at the Commands will process the data for distribution to the field on several different types of media, as required by the fielded systems. The CMPS also can produce CIB-formatted imagery in support of an Air Force requirement. The NIMA Arc Digitized Raster Graphics (ADRG) production system was merged with CMPS located at NIMA St Louis. This combined CMPS will produce ADRG, Compressed ADRG (CADRG), and Digital Chart Updating Manual (DCHUM) from hardcopy and softcopy maps and charts. CADRG is the Joint Chiefs of Staff (JCS) standard raster graphics format, replacing the Navy CAC and the Army Compressed Raster Graphics formats. The Navy plans to complete the fleet-wide conversion from CAC to the JCS Standard CADRG by the end of FY02, at which time NIMA will retire the CAC production system. NIMA currently plans to migrate the CMPS functions to the IEC platform in FY05.

(U//FOUO) **Controlled Image Base (CIB) Validation System and Point Positioning Production System (PPPS).** The CIB product is broad-area, unclassified, seamless, orthorectified, radiometrically-balanced, black and white imagery brought to common projection and tiling, with emerging scanned-map standard. It will be Vector Quantification (VQ)-compressed at 8:1, allowing 40 geocells per CD-ROM. Part of the USIGS FFD layer, some CIB imagery can be classified. Currently all CIB production is outsourced. Although both the FPE and the CMPS have a residual CIB production capability driven by non-NIMA user requirements, there are no plans for NIMA to produce CIB data in-house in the near future.

(U//FOUO) The CIB Validation System (CIB/VS) is used only to perform review and validation of contractor produced CIB data. The system comprises the equipment and software necessary to review compressed CIB image products on CD-ROM and uncompressed image frame data on 8mm tape. The delivered system consists of one server and five workstations, each configured with a 8mm tape drive, floppy drive and CD ROM reader; two printers; networking hardware; three CD writers and controllers; and a redundant array of inexpensive devices (RAID) storage array. NIMA plans to migrate the CIB/VS functions to the IEC platform in FY05.

(U//FOUO) The PPPS produces DPPDB products used for precision targeting and point positioning in the field. The IEC is currently not required to have the capability to make the DPPDB from both NTM and EIS. NIMA is investigating migration of the DPPDB production capability to the FPE in FY02, or onto the IEC platform in FY05.

(U//FOUO) **Data Capture and Finishing Environment (DCAFE).** DCAFE is a COTS-based data-capture and product finishing system, and is the principal MC&G product and information generation system. DCAFE provides the capability to produce finished geospatial digital and hardcopy products from features extracted by DE Alpha, NPC, IEC, various hydro sources, monoscopic imagery, DTED, and hardcopy. In addition, it provides the capability to extract geospatial feature data and attributes from hardcopy maps, charts, and orthorectified imagery. The migration path planned for DCAFE consolidates a number of legacy system functions into a common platform, in preparation for the migration to a set of platform-independent software applications. In order to meet operational throughput needs, workstations on the current VPF/PS and related mini-segments (including AIX/RS and ICSU) will be upgraded to Windows NT and DCAFE software through FY02.

(U//FOUO) DCAFE provides the capability to finish FFD, to include VPF MC&G products. DCAFE provides computer-assisted digitizing functions and information generation functions. DCAFE now incorporates the functionality for elevation MATRIX processing (including DTED and TERCOM) and the Single Integrated Overlay Program (Jet Navigation Chart (JNC) and Global Navigation Chart (GNC)). DCAFE is expected to continue as a mainstay of production throughout USIGS migration. As new VPF formatted products are prototyped and accepted by the user community, DCAFE will be the prime platform for such technology transfer to production scale. DCAFE is currently in an O&M, and is scheduled to migrate to IEC no earlier than FY04.

(U//FOUO) **Data Extraction Segment, Alpha (Upgrade) (DE Alpha).** The DE Alpha is the primary system used to support NIMA digital stereo feature and elevation extraction. DE Alpha includes many source preparation, self-tasking, and production management and feature extraction functions that migrated from SP/S, PM/S and UNYSIS. Self-tasking is critical to the production process, providing the necessary tools to initiate production jobs and generate the softcopy source packaging required for stereo extraction. DE Alpha also supports Terrain Contour Matching (TERCOM). DE Alpha inputs VPF data to support stereo intensification of feature foundation data (FFD) and provides gap fill capability for adverse areas. DE Alpha has the ability to input, process, display and exploit EIS sources. New interfaces to other USIGS systems will be explored and implemented as necessary. This would include interfacing to NIMA Libraries, FPE and the DCAFE systems. These enhancements will increase overall productivity and are oriented towards the workgroup concept. DE Alpha will obtain ASD/IDF from SA/S via the DS/S narrow band, or will obtain USMSD from FPE via 8mm tape. As part of this delivery, DE Alpha has the ability to process EIS formatted data. DE Alpha retains the capability to exploit current NTM. The capabilities to develop knowledge-based rules to assist cartographers with feature extraction/attribute population are not available commercially, nor is comparable stereo extraction capability commercially available. DE Alpha is the primary platform for GI feature extraction from imagery in support of production obligations while the IEC development concentrates on IA production, for the near term.

(U//FOUO) With arrival of MCGIL by FY02, DE Alpha will have a UIP-compliant interface to NIMA Libraries (NL) for EIS source for imagery and support data. The DE Alpha interface to DS/S is only for MC&G feature and elevation data. However, as long as DE Alpha and DS/S remain operational, it is not cost effective to create a UIP-compliant interface to DS/S from DE Alpha via the DIS. The legacy interface to DS/S is sufficient and will only be needed until FY04 (the scheduled shutdown of DS/S). DE Alpha is scheduled to be rehosted onto IEC platforms starting in FY03. DE Alpha currently has O&M funding into FY05.

(U//FOUO) **Defense Dissemination System (DDS).** The DDS delivers near real-time, near original quality imagery to US intelligence, military, and allied customers to locations worldwide. The fourth generation DDS Dissemination Element (DE) receives, decrypts and processes digital imagery data, and provides softcopy imagery and associated control data to exploitation workstations and central processing archives. Dissemination of NTM imagery currently

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involves multiple NIMA-managed systems. The DE supports ordering and receipt of imagery at a customer site. The DE pushes imagery into the IDEX II archive, which feeds various exploitation workstations (IDEX II, IEC, and commercial). Non-IDEX II sites rely on the DE as their primary archive for raw imagery, and employ other NIMA-provided archives (e.g., 5D, IPL, OPS) or custom developed archives for their exploited image products.

(U//FOUO) The DDS is migrating from a dedicated, point-to-point subscriber network to an open, web-based library infrastructure. The DEs will be systematically retired or reconfigured over time by IDS-D, replacing DDS custom hardware and software primarily with COTS information delivery software components integrated with the customers' library or existing infrastructure. The migration of DDS to a single DE baseline is a multi-step process, much of which is already completed with the fielding of DEs. The final migration step involves replacing the four remaining Rapid Dissemination System Migration Systems (RDSMS) at DIAC, NAIC, NIMA Langley, and the Joint IDEX II Facility (JIF) with DEs. Each RDSMS-to-DE migration will coincide with the CIL replacement for IDEX II. The RDSMS to DE migration will be completed by FY03. The migration of DEs to the Information Delivery Services begins in FY03 with transition planned for the end of FY04.

(U//FOUO) The NIMA Gateway also supports limited digital dissemination of NIMA imagery intelligence and GI products via INTELINK, SIPRNET, Open Source Information System (OSIS), and the public Internet. External customers will be able to access a wider variety of NIMA Imagery Intelligence and GI product holdings through linkages to the DPDW and enhanced Gateway capabilities. NIMA also supports physical dissemination of imagery via digital data cassette (D2C) tape media. Tape dissemination is cost effective for customers that either do not have a time dominant need for imagery or lack funding/access to wide band communications. Tape dissemination is expected to continue for the near future.

(U//FOUO) **Digital Geodetic Support System (DGSS) and Geodetic Data Applications System II (GDAS II).** The Digital Geodetic Support System (DGSS) is the replacement system for the Geodetic Data Assessment System I (GDAS I). DGSS provides an evaluation procedure of map and chart accuracy using existing survey control, grid and projection development for digital and non-digital product map and chart production, and specialized digitizing projects. The system was specifically designed to automate the Hydrographic Evaluation Process. Many hydrographic sources are foreign-produced paper charts that must be digitized before they can be integrated into the NIMA hydrographic database layers. DGSS uses stored control points for the necessary adjustments. DGSS functions are scheduled to migrate onto the IEC platform as part of IEC release v.4.5 in the beginning of FY04.

(U//FOUO) GDAS II performs photogrammetric map and chart evaluations by measuring points on both a manuscript and hardcopy stereo model sources and then comparing coordinate sets statistically. The system may input image support data (ISD) and instrument data file (IDF) from Source Acquisition Segment (SA/S) or hardcopy exploitation data from the FPE. The GDAS II system was upgraded to include the Video Capture subsystem. The subsystem captures latitude, longitude, and height for photogrammetrically derived points, as well as raster images of the points on a map "grabbed" from the GDAS II map table monitor. These coordinates and images are loaded to the Geodetic Information Management System (GIMS) and the Geodetic Library Database (GLDB) via a jazz disk. The Video Capture Subsystem provides ASCII text (without date field) and Tagged Image File Format (TIFF) images to the GLDB. GDAS II will not be receiving any new functionality, upgrades or enhancements in the near future and is slated to migrate onto the IEC as part of IEC release v.4.5 in the beginning of FY04.

(U//FOUO) **Digital Product Data Warehouse (DPDW).** The DPDW provides an on-line repository for various standard NIMA geospatial products. The DPDW provides direct access to these products for internal NIMA GI production. It will eventually support external customer access to these products through the NIMA Gateway, a NIMA-operated system that supports limited digital dissemination of NIMA imagery intelligence and GI products. Many of the products intended for the DPDW currently reside in various legacy databases. DPDW capabilities will also be expanded over time to handle additional data types, such as the Shuttle Radar Topography Mission (SRTM) digital terrain elevation data (DTED).

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(U//FOUO) **EXPIRT.** EXPIRIT is a current exploitation tool dependent on the GOTS ELT MATRIX. NIMA plans to migrate this functionality to an open architecture that will support standard COTS ELTs under the Special Mensuration Service (SMS) project in FY01/02.

(U//FOUO) **Feature-Level Database (FLDB).** The FLDB will provide a geospatial imagery information feature and elevation-level data store to support product production at the NPCs. Its primary objective is to support ongoing production operations until the NIMA Integrated Information Library (NIIL) becomes operational. Currently in development, the FLDB will have an initial deployment into two NPCs in FY02.

(U//FOUO) Currently, most geospatial information is produced on the DE/Alpha and stored in the Data Services Segment (DS/S) MC&G database. The DS/S MC&G database uses proprietary software that is not compatible with commercially available data formats or feature extraction tools. Further, geospatial information currently extracted on Integrated Exploitation Capability (IEC) workstations is stored in flat files on either the NIMA NGSS or the DPDW. Flat file storage does not provide the necessary attribution and production flexibility necessary for future production use. Initial FLDB deployment will support data migration from the DS/S MC&G and Feature Foundation Data (FFD) in Vector Product Format (VPF). It will also support information exchanges between the FLDB and the DE/Alpha. Additional data types and future interface enhancements will be implemented to support the current NPC deployment schedule and place NIMA in position to populate the NIIL.

(U//FOUO) **Front-end Processing Environment (FPE).** The FPE performs all-source geopositioning and triangulation functions in support of Geospatial Information (GI) extraction for absolute positioning. In addition to supporting GI feature extraction from stereo imagery, FPE processes image source data in support of MC&G Imagery Flow, to include Digital Point Positioning Database (DPPDB) generation on the Point Positioning Production System (PPPS). FPE places this source data into a format compatible for the USIGS and the MC&G production flow. Additionally, the FPE provides the capability to input, process, and radiometrically analyze multispectral imagery (MSI) and synthetic aperture radar (SAR) imagery in order to produce feature data sets. Finally, FPE can input, merge, edit elevation data, and generate orthorectified mosaics. The Digital Image Georeferencing System (DIGS) and Pooled Analytical Mensuration System (PAMS) functions were also migrated to FPE.

(U//FOUO) FPE supports EIS capabilities and produces the following image support data for stereo feature extraction: Adjusted Mapping Support Data (AMSD), Universal Sensor Model Support Data (USMSD), and Source packaging data. All three data types are derived from Metric Mapping Support Data (MMSD) which is currently created from Mapping Support Data (MSD) by SA/S. Future AMSD data will be created and stored back to SA/S. USMSDs and Universal Image Assessment Files (UIAFs) are produced and distributed. The USMSD supports DE Alpha self-tasking and will be distributed on 8mm tape. FPE inputs NTM source both by Digital Data Cassette (D2C) tape from Data Services Segment (DS/S) and via DPS Interface System (DIS) on an existing non-USIGS Interoperability Profile (UIP) compliant, but Common Object Request Broker Architecture (CORBA) compliant interface.

(U//FOUO) Once the MC&G Information Library (MCGIL) is available, FPE will have a UIP-compliant interface directly to the library (rather than IAS/Common Client) for imagery access and storage of support data. NTM source will be available from the MCGIL as the DS/S functions are phased out. Support data from SA/S will continue to be delivered to FPE via tape. The MCGIL will provide EIS source and MSD files to FPE. In addition, the MG&G IL will provide storage for the USMSD and UIAF files created by FPE.

(U//FOUO) In the longer-term, FPE functionality will enhance GI feature extraction. FPE is currently working to improve the performance throughput of its triangulation algorithm to cut the processing time, with an end goal of near-real-time processing. Additionally, NIMA plans to migrate the Digital Point Positioning Data Base production capability onto FPE in FY03. The vision for the FIA era is for FPE to provide improved triangulation algorithms to Segment 18 and FIA so that required processing is transparent to the user. Ultimately, the same support data will be

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used for both IA and GI production, so that it will no longer be necessary to create and store two separate support data types.

(U//FOUO) **Geographic Names Processing System (GNPS).** The GNPS is an automated system utilizing client server architecture to modify, manipulate and update the Geographic Names Database (GNDB). The GNDB contains the official DoD Foreign Place Names and Boundaries File, and is also the repository of all foreign names information approved for government use by the US Board of Geographic Names. GNPS supports the production of gazetteers and servicing of name packages for geospatial production, and provides remote access for other government organizations. GNPS will remain in O&M through FY05.

(U//FOUO) **Global Catalog.** The Global Catalog is a key segment within the ID&R MAA category, and functions based upon the A&D logical data model. Functionally, the global catalog capability permits "one-stop" querying of the following electronically accessible and physically transportable holdings:

- All current USIGS libraries
- All USIGS permanent archives
- External US government historical archives, such as the US Geological Survey (USGS) EROS Data Center
- Commercial imagery purchased by NIMA or users
- NIMA hard-copy products.

(U//FOUO) **Hardcopy and Media Production.** To accommodate the needs of deployed forces and to support users lacking full softcopy capability, the IR&R MAA will provide the following capabilities:

- Media conversion - converting softcopy information to film or computer-readable media
- Replication - creating low-volume copies of hardcopy information (film, printed materials)
- Reproduction - creating high-volume printed copies of information
- Delivery - transporting printed materials, film, and computer-readable media to the end user and to the Defense Logistics Agency (DLA) for standard distribution.

(U//FOUO) **Hydrographic Source Assessment System (HYSAS).** HYSAS functions include unique processes associated with extraction of sounding data from a wide variety of digital sources and hardcopy smooth sheets. HYSAS also catalogs, assesses, and fuses bathymetric data. HYSAS is currently in an O&M phase. NIMA is investigating the feasibility of migrating these functions onto the IEC platform in FY04, and migrating the Master Seafloor Digital Database and other hydrographic databases onto the Navigational Data Management System in FY04.

(U//FOUO) **Image Product Library (IPL).** The IPL provides local data storage and access for selected IGC organizations. IPL supports the storage and dissemination of imagery and imagery products, providing a library of information to imagery customers worldwide. Currently fielded in version 1.0, 2.5, and 2.51 at numerous sites worldwide, IPL supports both data pull and data push via user profiling. It is managed by the owning organization, but accessible to any IGC user with the proper permission via the Quick Query (Q2) and Broadsword clients.   The IPL is a migration activity to provide tactical image storage capabilities, as a successor to the Demand Driven Direct Digital Dissemination (5D) and the Image Product Archive (IPA). Each IPL contains shared and restricted imagery and imagery products that are required to support individual organizations. Each organization determines the population and manages most of its IPL. The data stored in an IPL is a mix between imagery and imagery products with the IPL owner determining the IPL content. The individual organizations also determine the size of their IPLs, the interfacing organizations, and the products requiring storage. Broadsword and Q2 are Netscape-like browsers that are used to access a number of imagery libraries, including IPL and 5D 4.04. Client 2001 will be another such browser that will provide access to IPL with release version 3.0. The Demand Driven Direct Digital Dissemination (5D) is a legacy system that provides imagery product dissemination.   5D provides a National Imagery

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Transformation Format (NITF)-Level 3 compliant imagery product server capability to numerous National and Tactical server sites. NIMA is providing operations and maintenance funding until recapitalization with Image Product Libraries (IPL) is complete in mid-FY02 at the CINCs and Services.

(U//FOUO) **Imagery Exploitation Support System (IESS).** The IESS is the DoD standard system that provides applications, tools, and databases for near-real-time support for imagery exploitation, requirements, and dissemination management for the Commands, Services, Navy Afloat, and tactical units. It is a modular, scaleable, standards-based, Department of Defense Intelligence Information System (DoDIIS)-compliant, client/server architecture. IESS is also a core component in the Common Imagery Ground/Surface System (CIGSS)/Distributed Common Ground System (DCGS) architecture, providing exploitation management and tasking of national and airborne imagery in support of in-garrison, pre-deployment, and deployment operations.   The transition to WFM, previously scheduled to begin in FY03-04, will not take place until after FY07.

(U//FOUO) **Imagery Modernization Program (IMP).** The IMP provides operational end-to-end softcopy imagery capabilities for DIA all-source analysts and NIMA imagery analysts still served by the DIA local area network (LAN). The IMP includes full-frame, full-resolution workstations and imagery-capable production workstations and image delivery infrastructure. This COTS/GOTS system is standards based and is connected to IDEX II, 5D, and Image Product Library (IPL).

(U//FOUO) **Information Access Services (IAS) and IAS Common Client.** The Information Access Services (IAS) segment implements the ID&R MAA for the USIGS. The IAS information infrastructure, which can be described as middleware between client applications such as the CC and back-end applications such as databases (e.g., Global Catalog serving as the IAS metadata database), will enable users to access data across the USIGS enterprise. The information infrastructure is being defined through the conceptual data modeling process, which directly enforces the DoD standards for data (Defense Data Dictionary System). USIGS systems base their logical data models on the conceptual data model.

(U//FOUO) The IAS are being developed to provide the library services for the NIMA Gateway, and provide media- or electronic-brokered interfaces to legacy systems including the IPL. As new libraries are delivered, IAS will provide direct access, such as for the IPL, or distributed access as in the DPDW-2, NIL, or MCGIL. The IAS deliver direct access to NIMA libraries with a co-located client; this also includes the delivery of distributed access to the Integrated Library System (ILS). The Web-based Access Retrieval Prototype (WARP) replaced the NIMA Library Pathfinder Information Management Environment (NL PRIME) system.

(U//FOUO) The IAS CC will provide a consistent interface. Though the IAS CC is one of several client applications within USIGS, it is the only one that provides a general, integrated interface to imagery, geospatial information, and management information across NIMA. The IAS CC requirements address the low-, medium-, and high-end users and administrators, with requirements for the ad hoc and standing query and retrieval of information. The IAS CC provides a general interface that provides access to the distributed USIGS enterprise, including USIGS libraries and legacy systems, across a heterogeneous set of libraries and data model implementations. The IAS CC provides the user with an integrated view of the information in this distributed enterprise.

(U//FOUO) The IAS CC will be integrated with the NIL, MCGIL, and all CILs in support of NIMA/IA and other agency requirements for access to source imagery. The IAS will assess opportunities to integrate with index concepts like the Gateway country page and the NL locator service. This will support the NIMA/IS Gateway requirements for the point-and-click user and provide ready access to NIMA information without performing complex queries or other operations.

(U//FOUO) **Integrated Exploitation Capability (IEC).** The IEC provides a COTS-based softcopy exploitation capability to USIGS imagery and geospatial analysts and non-NIMA DoD imagery analysts within the IGC. IEC has been identified as the primary target platform for the USIGS migration for a number of legacy systems including the

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imagery exploitation function of IDEX II (as a segment of NIES), Imagery Modernization Program (IMP), NIMA Softcopy Program (NSP) (formerly Softcopy Pilot program), and the Digital Production System (DPS). The IEC will replace all IDEX II workstations, augment exploitation/ production capabilities throughout the user community, and will be the vehicle to accomplish the migration of geospatial capabilities from the majority of the legacy stand-alone systems. The IEC will interface with the NIMA Libraries and with the data base systems for production management.

(U//FOUO) Most analysts will have an IEC softcopy workstation capable of all imagery exploitation functions, including large-area search at final operational capability (FOC). After FOC, although most analysis will be accomplished in softcopy, some archival analyses will continue to require light tables for hardcopy exploitation. From IEC applications, analysts will access common exploitation tools, principally through the Geospatial and Imagery Exploitation Services (GIXS) interface, to perform mensuration, limited target recognition, basic three-dimensional visualization, overlaying of imagery and maps and other routine imagery and geospatial analysis functions. The networks that support softcopy exploitation will have sufficient capacity to support IEC functional capabilities. Imagery and geospatial capabilities will be rolled into IEC through FY05, using spiral and incremental development methodologies, based on user priorities, program resources and budget, and COTS availability.

(U//FOUO) **Integrated Source Exploitation Environment (ISEE).** The ISEE is a government-developed system designed to gather information from the Production Management Segment (PM/S), Production Management Alternative Architecture (PMAA), SA/S, DS/S and the Aeronautical Digital Data Environment (ADDE) of the Aeronautical Migration System (AMS). It then places this information into a single environment from which regional analysts can efficiently perform their jobs. ISEE performs maintenance on and distribution for Digital Boundaries Data and also maintains TERCOM planning data, (Terrain Contour Matching; a data set supporting the US Navy cruise missile guidance procedure and datasets) which is passed to the Digital Products Data Warehouse (DPDW) for generation of MATRIX/map catalogs. ISEE tools are used to perform requirement analysis, product feasibility, currency determination, chart evaluation computations, product maintenance evaluation, and the preparation of Non-combatant Evacuation Operation packages. ISEE is currently in the O&M phase, and is not planned to migrate to IEC.

(U//FOUO) **Interactive Compilation System Upgrade (ICSU).** The ICSU is a special hydrographic program located at NIMA Bethesda. ICSU performs two major functions, track reconstruction and chart generation. ICSU is a legacy system in the sense that its functionality will be subsumed during the FYPD period by other newer systems. ICSU functions will migrate to IEC in FY05.

(U//FOUO) **Interactive Quality Review Systems (IQRS).** The IQRS is a COTS-based platform that has similar hardware as that found on the IEC platform minus the RAID storage. Normal production for IQRS includes DTED plus customer requirements for ARC coverage conversions of MC&G data. IQRS also supports the production of City Graphics, Image Maps, Military Installation Maps (MIM), and other potential large-scale products/requirements. IQRS will support Digital Elevation Model (DEM) finishing of MC&G elevation data, and quality assurance of the Shuttle Radar Topography Mission (SRTM)-derived elevation data. It will continue to create ARC-formatted MC&G files for various military customers. IQRS will migrate to IEC in FY02.

(U//FOUO) **Joint Mapping Toolkit (JMTK).** JMTK is an imagery and data visualization toolkit providing a standard suite of Defense Information Infrastructure Common Operating Environment (DII COE)-compliant GIS tools to the Global Command and Control System (GCCS) community. It provides the functions necessary render a common view of the battle space by standardizing the import, manipulation, and display of digital information. It will ultimately replace the legacy mapping functions for DII/COE Mission Applications. NIMA will transition from GOTS to COTS-based JMTK during FY05.

(U//FOUO) **Joint Targeting Workstation (JTW).** JTW provides a suite of national and tactical sensor model software which has been integrated into two fielded systems (the USN Point Target Workstation [PTW], and the

USAF Enhanced Precise Positioning Integrated Capability [EPPIC]). JTW functionality is currently dependent on CASS, and at some future point may have an indirect link to Ruler as a result of the CASS dependency.

(U//FOUO) **MATRIX.** MATRIX is a GOTS software toolkit consisting of an integrated set of unique image display, measurement, input, output, conversion, enhancement, manipulation, and exploitation modules with functionality that ranges from basic ELT functions to the more specialized exploitation services and classified processing capabilities. MATRIX supports national, tactical, and commercial sensors. MATRIX supports a wide user community across the IGC, and has been incorporated into a number of government systems. The MATRIX 6.0 version will be replaced by version 6.1 at the end of September 2001.

 (U//FOUO) **MC&G Information Library (MCGIL).** The MCGIL is designed to support the functional standards set by the MCGIF Project. MCGIF represents a system of functional components that will allow NIMA to request, receive, catalog, exploit, store and retrieve new source material by developing new segments (functional components) as well as modifying existing segments currently used in production and production support processes. The use of this new source data for MC&G production required the creation of the MCGIL to receive, store, and provide imagery and support data to MC&G production segments for exploitation and creation of geospatial data and products. The MC&G production segments will be modified to accept, exploit and store this new data and its associated products. This project will include several upgrades and enhancements to existing infrastructure both internal and external to NIMA. The MCGIL will be individually sized to handle the amount of USIGS data needed to fulfill individual mission requirements.

(U//FOUO) **Multi-image Exploitation Toolkit (MET).** MET is a GOTS Electronic Light Table (ELT) and 3D photogrammetric toolkit for image analysts and others whose applications involve comparison analysis or measurement of multiple images from spaceborne and airborne sensors. It provides image display, measurement, registration, orthorectification, Image Derived Product (IDP) generation, mosaicing, and rapid search capabilities. MET is used to automatically register homogenous and heterogeneous sensor data, build mosaics, combine images with maps, and create image products with or without annotation and grids. It is also used to exploit imagery using easy change detection methods, such as swipe, sequence and positive-negative change detection. MET can also create perspective views, fly-throughs and artificial anaglyphs for stereo viewing. MET incorporates the Ruler mensuration services, and supports a large user community across the IGC. The MET version 2.4.3 will be replaced by version 2.5 at the end of September 2001.

(U//FOUO) **National Exploitation System (NES).** The NES is the historical repository for imagery intelligence reports created on the legacy National Data System, the DIA Advanced Imagery Requirements and Exploitation System (AIRES) Lifecycle Extension (ALE). Customers worldwide can access the NES database via Intelink-TS. The NES also provides the Intelink-TS users the capability of displaying image footprints and targets of interest on NIMA map background data. Thus, the research customers are able to quickly assess image availability over their targets of interest and can access historical national imagery archives through the NES interface to the NACDF, scheduled to begin in FY03. TMS functions planned to transfer to NES in the FY04 timeframe have been delayed to the post-FYDP period as a result of the re-baseline effort. In addition, the NES transition to WFM, originally scheduled for the FY04-06 timeframe, has been delayed until beyond the FYDP period.

(U//FOUO) **National Imagery Derived Products (NIDP).** National Imagery Derived Products (NIDP) is the approved NIMA standard software tool for producing imagery derived products from all source imagery. By FY03/04, NIMA plans to modify NIDP to operate with COTS ELTs in lieu of MET.

(U//FOUO) **National Information Library (NIL).** The NIL stores imagery, imagery support data, imagery derived, and geospatial information that will be managed by NIMA for the IGC. The first instance of the NIL, also known as the SCI-NIL, is a community asset that will store national imagery at the SCI level. Information Delivery Services will support imagery delivery from the NTM provider to the NIL. Users will find and retrieve imagery stored in the NIL via the IAS Common Client (CC) or any other standards compliant client. Any workstation or system with a

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connection to the Defense Information Systems Network (DISN) Asynchronous Transfer Mode (ATM) Services (DATMS) or the Joint Worldwide Intelligence Communication System (JWICS) hosted Intelligence Network (INTELINK) can have access to worldwide imagery coverage. Evolutionary enhancements are planned for the NIL throughout the FYDP.

(U//FOUO) **Navigation Safety System (NSS).** The NSS functions include rapid extraction of navigation safety features and information from both hardcopy and softcopy sources, creation of the weekly Notice to Mariners, and creation of nautical text products. The NSS migrated and integrated the functions of the Automated Notice to Mariners System (ANMS), Classified Hydrographic Information Processing System (CHIPS), and NAVINFONET. Future functionality and capabilities include the Secure Internet Protocol Router Network (SIPRNET), the NIMA Secret Collateral Enterprise Network (SCEN) connectivity, and a tape backup library system. Migration of NSS workstations to IEC and the databases to the NDME will take place in FY04.

(U//FOUO) **Nautical Database Maintenance Environment (NDME).** The Nautical Database Maintenance Environment (NDME) will provide customers with up-to-date, tailored data on demand from a single digital nautical data maintenance environment focused on aggressive data collection and near real-time information processing by regional teams that leverage the advantages of imagery, imagery intelligence, and hydrographic data sources.

(U) **NIMA Gateway.** The NIMA Gateway is an on-line digital warehouse/store used for global dissemination of NIMA data, products, and information (Imagery, Intelligence, Geospatial Information, Community Imagery Policy, Corporate Information and Policies, and NIMA College Information). Digital information is hosted on servers located at Arnold, Bethesda, and the Washington Navy Yard and is accessible to Internal and external customers via various communication networks at appropriate security levels. The IAS program works with the NIMA Gateway to improve the CC capabilities and place more data on-line. As the Gateway remains the primary way external users currently obtain NIMA information electronically, it is an essential requirements driver for the program. Technology tracking and insertion, and user comment collection and incorporation are natural parts of the IAS incremental development, but are limited by budget realities. FY02 planning includes incorporating user comments from each IAS site to provide a level of responsiveness while maintaining a common approach.

(U) **NIMA Geospatial Storage System (NGSS).** The NGSS is a COTS based storage system intended as a temporary measure to meet an operational shortfall in the storage of information produced by the NIMA Production Cells (NPCs), DCAFE, and NIMA production outsourcing contracts. NGSS data holdings initially were planned to migrate to the NIMA Library program, however; under current planning, NGSS data may (TBD) migrate to the FLDB, and ultimately to the NIIL.

(U//FOUO) **NIMA Integrated Information Library (NIIL).** The NIIL concept establishes the future vision for the Information Storage MAA. Planning and programming for the NIIL is currently scheduled to begin during FY06, with fielding sometime beyond the current FYDP period. The initial NIIL vision introduced a concept of geospatial-enabled intelligence production and storage. Major system level requirements included:

- GI feature extraction that allows features to be updated quickly and stores old feature information.
- IA exploitation using symbology (object technology) which would change current reporting formats. Resulting information would be stored in the same environment as GI feature and attribution information.
- Current GI feature and attribution data (e.g. MC&G database and hydro database.) would migrate into this environment to serve as the baseline object database.
- Standard product views (e.g. hardcopy map outputs and computer display views) would be generated using software that pulls from a virtual intelligence information library.

(U//FOUO) **NIMA Libraries.** The NIMA library (NL) architecture consists of a hierarchical family of digital libraries differentiated by storage capacity and performance. The NL provide access to imagery, imagery intelligence and geospatial information and products for USIGS customers by integrating information delivery,

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storage, access and retrieval, and reproduction and replication. NIMA Libraries consist of a COTS-based open architecture and encompass four segments: National Information Library (NIL), Geospatial Libraries, Command Information Library (CIL), and Image Product Library (IPL). The NIMA Libraries will form an integrated configuration supporting imagery and geospatial data access. During the FYDP timeframe, libraries will be deployed with a common set of applications tailored to meet customer-specific needs. USIGS Libraries will consist of independently developed, integrated software solutions that share a common computing infrastructure. Network connectivity will provide direct input from source data providers and assure broad client access by authorized remote users.

(U//FOUO) **NIMA Production Cell (NPC).** The NPC concept is a precursor to the IEC and is installed at WNY, NIMA Bethesda, and NIMA St. Louis. The NPC has initial COTS capabilities to display, extract features from stereo source, and to finish data sets, but does not implement the UIP standard interfaces or the integrated IEC software packages. Thus, it will meet some near-term production requirements including FFD extraction, Digital Terrain Elevation Data (DTED), and Point Target products, and some IA products and reports. NPC workstations are scheduled to be replaced by IEC workstations by FY05.

(U//FOUO) **NIMA Production Cell - Americas (NPC-A).** A prototype system based on the NPC configuration, which demonstrates the concept of an integrated imagery analysis and geospatial information system (GIS) environment and process flow established primarily for the Caribbean and Latin America region. This environment is intended to be an essential IC crisis resource. It will contain data on physical features such a terrain, transportation infrastructure, utilities, government facilities, military installations, commercial enterprises, and diplomatic facilities. Data will be in forms such as text, imagery, ground photographs, maps, line drawings, and videos. The environment would be hosted on Intelink TS, and possibly available on interactive CD-ROM, to support analytical studies, operational planning, and crisis support planning by customers throughout the IGC Community.

(U//FOUO) **NIMA Softcopy Program (NSP).** The NIMA Softcopy Program (formerly the Softcopy Pilot program) was designed as a proof-of-concept for desktop softcopy imagery analysis. NSP will provide COTS and GOTS capabilities to display and exploit NTM imagery for the development of some IA products and reports. It transferred to operational status, and currently serves NIMA imagery analysts at WNY and Langley with its connection to the Joint IDEX II Facility and its archive of imagery.

(U//FOUO) **Production Management Alternate Architecture (PMAA).** The PMAA replaces critical functionality of the legacy DPS PM segment for NIMA GI production environments. The Digital Production System Production Management segment was not Year 2000 compliant and contingency operations were established to continue supporting NIMA geospatial production. PMAA will replace or augment contingency capabilities by focusing on functionality gaps or manually intensive operations. PMAA will be implemented in phased incremental deliveries. Guidelines for this replacement call for COTS-based applications solutions, zero modifications to COTS, customized solutions in key areas only, commercializing the business process, and operations involvement throughout the lifecycle. PMAA migration encompasses conversion of the relevant functions from the legacy PM/S to COTS access to workstations in geospatial production centers, acquiring file servers and databases to store production management information, networking the workstations to servers, migrating legacy data, and integrating other applications. PMAA marks the beginning of the migration of geospatial production management applications to a distributed processing environment based on the USIGS Architecture.

(U//FOUO) **Raindrop.** Raindrop is a commercial software tool that exploits the DPPDB, which is used to perform point mensuration. Additionally, NIMA has validated SOCET Set (COTS) and is in the process of validating JTW (GOTS) to accurately perform the points mensuration from DPPDBs. Raindrop is currently being used in NIMA production, and by many IGC users.

(U//FOUO) **Remote Replication.** Although most media conversion will be accomplished at the NIL and MCGIL or at outside suppliers (for hardcopy geospatial products), some film, hardcopy (printed material), and computer-

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readable media production will occur at user locations (often associated with current storage CILs or IPLs). CILs and the NIL, and the MCGIL will have the capability to produce limited quantities of computer-readable media.

(U//FOUO) **Requirements Management System (RMS).** The RMS is the primary USIGS capability used to manage and task imagery collection, exploitation, production, and distribution. This USIGS segment initiates, specifies, reviews, approves, updates, and monitors imagery requirements, provides imagery tasking to overhead or airborne collection, production and distribution organization, as well as exploitation centers. During FY01, the RMS initiated web-based capabilities to allow those sites not requiring a full RMS workstation configuration, the ability to accomplish certain imagery requirement management functions through the Intelink. The RMS has been modified to support EIS capabilities. In September 2000, NIMA made the decision to extend the life cycle of RMS in conjunction with a decision to delay the start of an acquisition of a new Order Entry and Tracking MAA to the FY06 timeframe. The extension of RMS will also result in modifications to support FIA capabilities.

(U//FOUO) **Ruler.**   Ruler provides standard mensuration and geopositioning capabilities to the IGC. Ruler provides hardcopy and softcopy mensuration support for imagery analysts and imagery scientists throughout the IC. As a hardcopy mensuration tool, Ruler replaces the Precision Mensuration System (PMS) and the Light Table Mensuration System (LTMS). As a softcopy mensuration tool, Ruler provides a standardized application program interface (API) for integration and use by other numerous programs and commercial vendors. Ruler provides certified mensuration support for the current national sensors and their associated imagery formats. Current Ruler capabilities include national sensor model including EIS sensor models, National Imagery Transmission Format (NITF) 2.1 support, and the ability to access over 120 geometrically-based measurement output functions. The current version of Ruler is Ruler 11.0. NIMA plans to update Ruler through FY07.

(U//FOUO) **Shared Requirement Database (SRDB).** The SRDB is a shared database developed under a joint program. It is a common register for all types of imagery and geospatial source material collection, image data and non-image source processing, exploitation, production, dissemination management and for commercial satellite image data and non-image source processing, exploitation, production, dissemination management and for commercial satellite image data collection management.

(U//FOUO) **Softcopy Search Initiative.** The Softcopy Search Initiative is a coordinated ATA/ATT effort, in close partnership with NIMA/IA and NIMA/IP, to identify and refine requirements, prototype possible solutions, and direct the migration of a Softcopy Search Exploitation Capability with a deployment scheme targeted on impacting existing NIMA segments. The initiative was begun in October 2000 and has identified a Softcopy Search process definition, generated draft user and system requirements, and conducted market research and investigation to determine the availability of COTS solutions. The initiative is currently drafting plans for several prototyping efforts, and plans to conduct an Operational Test and Evaluation (OT&E) of a deployable Softcopy Search capability by 3QFY03. The Softcopy Search team is working closely with the NIMA FIA program office on potential issues dealing with requirements for hardcopy film production of in the FIA era.

(U//FOUO) **Source Acquisition Segment (SA/S).** The SA/S is part of the Digital Production System, which manages imagery source acquisition and provides the production segments the support data necessary to exploit the imagery. The SA/S provides the capability to perform feasibility analysis, tasking, new data extraction, data retrieval, image library service, source distribution, and data management requests for geospatial information production. SA/S contains imagery support data to include Mapping Support Data, Adjusted Mapping Support Data, and Accuracy Support Data.

(U//FOUO) **Source Tasking and Tracking Tool (STATT)**. The STATT is a planning and tasking mechanism for the NIMA Mapping, Charting and Geodesy Collection program. STATT creates and builds, based upon user request, collection nominations and sends these to RMS for execution. Nomination status is passed back to STAT by RMS and STAT updates this information in its database for access by its users.

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(U//FOUO) **Target Management System (TMS).** The TMS replaces the Point Information Management System with and architecture that supports a COTS-based processing environment using client/server computer architecture. The TMS provides the capability to store and track the production of point target and gridded photo data and requests. The TMS interfaces with the Modernized Integrated Database (MIDB) via the NIMA MIDB Interface server. TMS incorporates the critical Point Information Management System (PIMS) functionality to manage targets, and produce various targeting file products for several external customers. TMS was planned to migrate to the National Exploitation System (NES); however, with the re-scoping of the information management segments this migration is under review.

(U//FOUO) **USIGS Warfighter Information Library (UWIL).** The UWIL will have the same performance characteristics as a CIL but will be sized to accommodate data of immediate utility to the warfighter. The UWIL will increase the availability of Secret NTM imagery to the warfighter by evolving the existing non-USIGS Joint Warfare Analysis Center (JWAC) Warfighter Imagery Library (WIL) to the UWIL with no downtime or degradation to JWAC and the existing support. The UWIL is also a location for distributed storage. UWIL scope includes upgrades to multiple USIGS segments and supporting communications infrastructure. Some limited hardware will be re-utilized from the existing JWAC WIL. Additional CIL hardware will be added and the NL 3.2 software baseline will be installed. The IOC for the UWIL is scheduled for June 2002 and FOC for the following month.

(U//FOUO) **Web-Based Access and Retrieval Prototype (WARP).** The WARP is a prototype imagery server that provides access to a 45-day archive of selected national imagery. The 45-day archive consists of primary (unexploited), full frame, US-only and Secret collateral imagery in NITF accessible via a secure web site. The WARP provides access via the DATMS and the Secret Internet Protocol Routing Network (SIPRNET) and the Global Broadcast System (GBS) as well as one-way dissemination over the Joint Broadcast System (JBS).

(U//FOUO) Appendix B

Acronyms and Abbreviations

A&D	Archive and Dissemination
ADDE	Aeronautical Digital Data Environment
ADMS	Automated Data NIMA Monitor Stations
ADRG	ARC Digitized Raster Graphic
AES	Advanced Edit System
AIEE	Aeronautical Imagery Exploitation Environment
AIM	Advanced Intelligence, Surveillance, and Reconnaissance Management
AIM	Annotated Image Mosaic
AIRES	Advanced Imagery Requirements and Exploitation System
AIX/RS	Alternate Imagery Exploitation/Revision Segment
ALE	AIRES Lifecycle Extension
AM	Acquisition Manager
AMS	Aeronautical Migration Systems
AMSD	Adjusted Mapping Support Data
ANMS	Automated Notice to Mariners System
AOE	Aeronautical Obstacle Environment
API	Application Program Interface
ASD	Assistant Secretary of Defense
ASE	Aeronautical Source Environment
AT	Acquisition and Technology
ATM	Asynchronous Transfer Mode
BAS	Broad Area Search
BES	Budget Estimate Submission
C4I	Command, Control, Communications, Computers and Intelligence
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CAC	Compressed Aeronautical Chart
CADRG	Compressed ARC-Digitized Raster Graphics
CARS	Contingency Airborne Reconnaissance System
CASS	Common Architecture Support Services
CATIS	Computer Aided Tactical Information System
CBJB	Congressional Budget Justification Book
CC	Common Client
CD-ROM	Compact Disc-Read Only Memory
CENTCOM	United States Central Command
CHIPS	Classified Hydrographic Information Processing System
CHUM	Chart Update Manual
CIA	Central Intelligence Agency
CIB	Controlled Image Base
CIB/PS	Controlled Image Base/Production System
CIB/VS	Controlled Image Base/Validation System
CICMP/AIP	Community Integrated Collection Management Program/Advanced ISR Management Applications

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CIGSS	Common Imagery Ground/Surface System
CIL	Command Information Library
CIMT	Commercial Imagery Management Tool
CINC	Commander-in-Chief
CIP	Common Imagery Processor
CISA	C4 Intelligence Support Activity
CJB	Congressional Justification Book
CMP	Configuration Management Plan
CMPS	Common Mapping Production System
CMS	Cost Monitoring Specialist
CMS	Community Management Staff
CNS	Consolidated Navigation System
COE	Common Operating Environment
COE	Center of Excellence
COGNOS	COTS Tool for Report Generation
COLISEUM	Community On-Line Intelligence System for End-Users and Managers
CONOPS	Concept of Operations
CORBA	Common Object Request Broker Architecture
COTS	Commercial-Off-The-Shelf
CPA	Chairman's Program Assessment
CPBS	Capabilities Programming and Budgeting System
CPD	Consolidated Product Database
CPS	Cluster Process System
CPU	Central Processing Unit
CSA	Common Support Application
CSIL	Commercial Satellite Imagery Library
CT/MDI	Conditional Tasking/Multi-Disciplined Interaction
CTPS	Computer to Plate System
D2C	Digital Data Cassette
DATMS	DISN ATM Service
DB	Database
DBG	Defense Budget Guidance
DCAFE	Data Capture and Finishing Environment
DCGS	Distributed Common Ground System
DCHUM	Digital Chart Updating Manual
DDRS	Defense Data Repository System
DDS	Defense Dissemination System
DE	Dissemination Element
DE Alpha	Data Extraction Segment, Alpha (Upgrade)
DEM	Digital Elevation MATRIX; Digital Elevation Model
DGRS	Differential GPS Reference Station
DGSS	Digital Geodetic Support System
DIA	Defense Intelligence Agency
DIAC	Defense Intelligence Analysis Center
DIEPS	Digital Imagery Exploitation and Production System
DIGS	Digital Image Georeferencing System
DII	Defense Information Infrastructure
DII COE	Defense Information Infrastructure Common Operating Environment
DIMES	Deployable Imagery Manipulation Environment

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DIS	DPS Interface System
DISA	Defense Information Systems Agency
DISN	Defense Information System Network
DLA	Defense Logistics Agency
DMMS	Digital Media Management System
DMS	Defense Messaging System
DO	Directorate of Operations
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDIIS	Department of Defense Intelligence Information System
DPDW	Digital Product Data Warehouse
DPG	Defense Planning Guidance
DPPDB	Digital Point Positioning Data Base
DPS	Digital Production System
DR	Discrepancy Report
DRB	Defense Review Board
DS/S	Data Services Segment
DSSCS	Defense Special Security Communications System
DTED	Digital Terrain Elevation Data
DTF	Digital Test Data Format
DTF	Development Test Facility
EAC	Enhanced Analyst Client
ECHUM	Electronic Chart Update Manual
EDMS	(Total Station) Electronic Distance Measuring System (see also TS EDMS)
E/DRB	Extended Defense Review Board
EIS	Enhanced Imaging System
ELT	Electronic Light Table
EMET	Enhanced Metric Exploitation Tool
EPPE	Enhanced Product Prototyping Environment
EPPIC	Enhanced Precise Positioning Integrated Capability
EPS	Enhanced Processing Segment
EROS	
ESD	Exploitation Support Data
EUCOM	United States European Command
FCPE	FLIP Chart Production Environment
FE/S	Feature Extraction Segment
FFD	Feature Foundation Data
FIA	Future Imagery Architecture
FLDB	Feature Level Database
FLIP	Flight Information Publication
FOUO	For Official Use Only
FOC	Full Operational Capability
FPE	Front-end Processing Environment
FY	Fiscal Year
FYDP	Future Years Defense Plan
G&G	Geodesy and Geophysics
GALE	Generic Area Limitation Environment

GBS	Global Broadcast Service
GCCS	Global Command and Control System
GCCS-I3	Global Command and Control System, Integrated Intelligence and Imagery
GDAS II	Geodetic Data Applications System II
GDIP	General Defense Intelligence Program
GENSER	General Service
GGEPS	Geodesy and Geophysics Enhanced Production System
GI	Geospatial Information
GI/PS	Geospatial Information Production Services
GIAS	Geospatial and Imagery Access Service
GIMS	Geodetic Information Management System
GIS	Geographic Information System
GIXS	Geospatial and Imagery Exploitation Services
GLDB	Geodetic Library Data Base
GNC	Global Navigation Chart
GNDB	Geographic Names Database
GNPS	Geographic Names Processing System
GOB	Geospatial Operations Branch
GOTS	Government-Off-The-Shelf
GPS	Global Positioning System
GPS MSN	GPS (NIMA) Monitoring Station Network
GPS NCC	GPS Network Control Center
GPS/OMNIS	GPS Orbit Mensuration and Navigation Improvement System
GSTSS	GPS Sled Track Survey System
GRT	Geospatial Research Tool
GUI	Graphical User Interface
HE/S	Hardcopy Exploitation Segment
HRU	Hardcopy Reconstruction Unit
HSI	Hyper Spectral Imagery
HTML	Hypertext Markup Language
HYSAS	Hydrographic Source Assessment System
IA	Imagery Analyst
IAS	Information Access Services
IBES	Intelligence Budget Estimate Submission
IC	Intelligence Community
ICD	Interface Control Document
ICSU	Interactive Compilation System Upgrade
ID&R	Information Discovery and Retrieval
IDC-A	Image Data Controller Type A
IDEX II	Imagery Data Exploitation System II
IDF	Instrument Data File
IDP	Image Derived Product
IDS	Information Delivery Services
IEC	Integrated Exploitation Capability
IERM	Information Exchange Requirements MATRIX
IESS	Imagery Exploitation Support System
IFSAR	Interferometric Synthetic Aperture Radar
IG	Intelligence Group *(USAF)*

IGC	Imagery and Geospatial Community
ILS	Integrated Library System
IMINT	Imagery Intelligence
IMP	Imagery Modernization Program
IMP	Information Management Project
INTELINK	Intelligence Network
IOC	Initial Operational Capability
IPDM	Intelligence Program Decision Memorandum
IPL	Image Product Library
IPOM	Intelligence Program Objective Memorandum
IPRG	Intelligence Program Review Group
IPT	Integrated Project Team
IQC	Internal Quality Control
IQRS	Interactive Quality Review System
IRM	Information Requirements Management
IRP	IDEX Replacement Program
IR&R	Information Reproduction and Replication
IRS	Imagery Requirements Structure
ISD	Image support data
ISI	Information Services Interface
ISEE	Integrated Source Exploitation Environment
IT	Information Technology
ITF	Integrated Test Facility
JBS	Joint Broadcast System
JCMT	Joint Collection Management Tool
JCS	Joint Chiefs of Staff
JFCOM	Joint Forces Command
JFIC	Joint Forces Intelligence Center
JIF	Joint IDEX II Facility
JIVA	Joint Intelligence Virtual Architecture
JMIP	Joint Military Intelligence Program
JMTK	Joint Mapping Toolkit
JNC	Jet Navigation Chart
JOG	Joint Operations Graphic
JPEG	Joint Photographic Experts Group
JPL	Jet Propulsion Laboratory
JTA	Joint Technical Architecture
JTF	Joint Task Force
JTW	Joint Targeting Workstation
JWAC	Joint Warfare Analysis Center
JWICS	Joint Worldwide Intelligence Communications System
LAN	Local Area Network
LASER	Large Area Softcopy Exploitation Resource
LDM	Logical Data Model
LTA	Long Term Archive
LTMS	Light Table Mensuration System
LUT	Look Up Table

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MAA	Mission Area Application
MAN	Metropolitan Area Network
MASINT	Measurement and Signature Intelligence
MATRIX	Multi-source Automated Target Recognition Interactive Exploitation
MC&G	Mapping, Charting, and Geodesy
MCGIF	Mapping, Charting and Geodesy Imagery Flow
MCGIL	Mapping, Charting and Geodesy Information Library
MCISU	Marine Corps Imagery Support Unit
MET	Multi-image Exploitation Toolkit
MIDB	Modernized Integrated Data Base
MIM	Military Installation Map
MINT	Multi-source Intelligence Toolkit
MMSD	Metric Mapping Support Data
MRDBS	MASINT Requirements Database System
MSD	Mapping Support Data
MSI	Multispectral Imagery
MSMS	(NIMA) Multi-System Maintenance Support

NACDF	National Area Coverage Data File
NAIC	National Air Intelligence Center
NAVINFONET	Navigation Information Network
NCA	National Command Authorities
NCCB	NIMA Configuration Control Board
NDME	Nautical Database Maintenance Environment
NDS	NIMA Data System
NEN	NIMA Enterprise Network
NENDRD	NIMA Enterprise Network Design and Requirements Document
NEO	Non-Combatant Evacuation Operation
NES	National Exploitation System
NFIP	National Foreign Intelligence Program
NGIC	National Ground Intelligence Center
NGPSMS	NIMA Global Positioning System Monitoring Station
NGSS	NIMA Geospatial Storage System
NICR	New Image Collection Request
NIDP	National Imagery Derived Products
NIES	National Imagery Exploitation System
NIIB	NIMA Imagery Intelligence Brief
NIIL	NIMA Integrated Information Library
NIL	National Information Library
NIMA	National Imagery and Mapping Agency
NITF	National Imagery Transmission Format
NL	NIMA Library(ies)
NL PRIME	NIMA Library Pathfinder Information Management Environment
NOC	NIMA Operations Center
NPC	NIMA Production Cell
NPC/A	NPC/Americas
NRMM	NATO Reference Mobility Model
NSP	NIMA Softcopy Program
NSS	Navigation Safety System
NTM	National Technical Means

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NTM	Notice to Mariners
O&M	Operations and Maintenance
OC-3	Optical Carrier 3 (155 Mbps)
OC-12	Optical Carrier 12 (622 Mbps)
OET	Order, Entry, and Tracking
O/F	Operations Facility
OIM-A	Orthorectified Image Mosaic, Ascending mode
OIM-D	Orthorectified Image Mosaic, Descending mode
O&M	Operations and Maintenance
OMB	Office of Management and Budget
ONC	Ocean Navigation Chart
OPS	Open Primary Server
OSD	Office of the Secretary of Defense
OUSD	Office of the Under Secretary of Defense
OVT	Operational Verification Testing
PACOM	United States Pacific Command
PAMS	Pooled Analytical Mensuration System
PASS	Pooled Analytical Stereo Plotter System
PBD	Program Budget Decision
PDM	Program Decision Memorandum
PEO	Program Executive Office
PGPS	Point Graphic Production System
PG/S	Product Generation Segment
PID	Planned Imaging Data
PID	Program Implementation Document
PIMS	Point Information Management System
PM	Program Manager
PMAA	Production Management Alternate Architecture
PM/S	Production Management Segment
PMS	Precision Mensuration System
POM	Program Objective Memorandum
PPBS	Planning, Programming, and Budgeting System
PPPS	Point Positioning Production System
PTW	Precision Targeting Workstation
QC	Quality Control
R&R	Reproduction and Replication
RAID	Redundant Array of Inexpensive Devices
RAS	Requirements Analysis System
RDBI	RMS Data Browser Interface
RDBMS	Relational Database Management System
RDSMS	Rapid Dissemination System Migration System
RFC	Request for Change
RIC	Requirements-to-Image Correlation
RMG	Resource Management Group
RMS	Requirements Management System
RRS	Remote Replication System

S	Secret
SAFE	Support for the Analyst's File Environment
SAR	Synthetic Aperture Radar
SA/S	Source Acquisition Segment
SBU	Sensitive But Unclassified (Network)
SCEN	Secret Collateral Enterprise Network
SCI	Sensitive Compartmented Information
SCI NIL	SCI National Information Library
SDE	Support Data Extension
SEM	Softcopy Exploitation Management
SE/SI	Systems Engineering/Systems Integration
SGML	Standard Generalized Markup Language
SHB	Seam Hole Bitmap
SIGINT	Signals Intelligence
SIPRNET	Secure Internet Protocol Router Network
SMS	Special Mensuration Service
SONET	Synchronous Optical Network
SP/S	Source Preparation Segment
SPAWAR	Space and Naval Warfare Systems Command
SQL	Structured Query Language
SRDB	Shared Requirements Database
SRTM	Shuttle Radar Topography Mission
SSL	Secure Sockets Layer
STATT	System Tasking and Tracking Tool
STRATCOM	United States Strategic Command
TADS	Text Aeronautical Data System
TAP	TPED Assessment Process
TAPS	Terminal Approach Production System,
TEMP	Test and Evaluation Master Plan
TBD	To Be Determined
TBR	To Be Resolved
TDS	Tape Duplication System
TERCOM	Terrain Contour Matching
TFP	Tactical Fusion Prototype
TFRD	Tape Format Requirements Document
TIARA	Tactical Intelligence and Related Activities
TIC	Target-to-Image Correlation
TIFF	Tagged Image File Format
TMS	Target Management System
TPED	Tasking, Processing, Exploitation and Dissemination
TRM	Technical Reference Model
TS	Top Secret
TSEDMS	Total Station Electronic Distance Measuring System
U	Unclassified
UERS	USIGS Enterprise Requirements Specification
UGPM	USIGS Geospatial Production Management
UIAF	Universal Image Assessment File

UIP	USIGS Interoperability Profile
UITF	USIGS Integrated Test Facility
UOA	USIGS Operational Architecture
UOSA	USIGS Objective System Architecture
USGS	United States Geological Survey
USIGS	United States Imagery and Geospatial Information Service
USJFCOM	United States Joint Forces Command
USMSD	Universal Sensor Model Support Data
UWIL	USIGS Warfighter Information Library
VPF/PS	Vector Product Format/Production System
VIP	Validation of Integrated Points services
WALA	Washington Area Library Architecture
WAN	Wide Area Network
WARP	Web-based Access Retrieval Prototype
WFM	Workflow Management
WIL	Warfighter Imagery Library
WNY	Washington Navy Yard
WWNWS	World Wide Navigation Warning System
WWW	World Wide Web
XFTP	Extended File Transport Protocol
XML	Extensible Markup Language
5D	Demand Driven Direct Digital Dissemination (System)

(U//FOUO) Appendix C

Glossary of Terms and Phrases

(U) This Appendix presents descriptions of terms, activities, or programs that have impact upon or are affected by the USIGS migration process. Some of the project/segment level terms described here are outside of NIMA/USIGS. Still, NIMA activities are listed here, as opposed to Appendix A. In several of these cases, particularly those concerning legacy systems, the appendix placement decision was a subjective one.

(U) **Absolute Gravimeter:** A geodesy and geophysics survey device used to determine the vertical position and geoid for gravity data and support of inertial navigational systems.

(U) **Advanced Edit System 2 (AES 2):** The AES 2 permits inputs of media containing digital data such as vertical obstructions, aim points, order of battle, aeronautical information (airports, runways, navigation aids, aeronautical boundaries, special use air space), GNPS tapes, TIFF files, safe passage, isogonics, and isogrives. This software and some of the peripheral hardware were added to the DCAFE system.

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

(U) The **Arc Digitized Raster Graphics System (ADRG):** This production system inputs ancillary data and scanned hardcopy maps to produce a digital raster graphics CDROM. ADRG can be compiled from ONCs, TPCs, JNCs, JOGs, or City Graphics, or any combination thereof. Also called ADRG Production System. This system is now linked and merged with the CMPS.

(U//FOUO) **Archive and Dissemination (A&D) Element:** The A&D element provides the capability to store, catalog, retrieve, replicate, and disseminate information across the USIGS. This element responds to the customer with the requested imagery or geospatial product, or indicates that the request cannot be filled with existing information. The element receives imagery, imagery intelligence and geospatial information from both the Collection and Processing element and the Exploitation and Production element.

(U) **Astrolabe:** The A35M geodetic astrolabe is a custom geodesy and geophysics project survey device. It determines latitude and longitude in support of DoD weapon systems test facilities and ranges, the operational deployment of advanced inertial navigation system-equipped aircraft (e.g. B-2, F-117), and the refinement of the WGS-84 geoid.

(U) **Automated Notice to Mariners:** A dedicated system that produced Notice to Mariners, sailing directions, and other hydrographic data products. It included the Consolidated Navigation System, the Classified Hydrographic Information Processing System and the interface to the Navigation Information Net which distributed some of the ANTM data products. This functionality is now added to the NSS.

(U//FOUO) **Collection and Processing Element:** The Collection and Processing element is external to USIGS, and provides the capability to collect and process the source information required to produce geospatial information and imagery intelligence. This element receives tasking from the Information Management element and provides processed data to the Archive and Dissemination element for delivery and storage. The Collection and Processing element returns collection status to the Information Management element as tasks are accepted, scheduled, executed and completed. The element provides information and imagery to the USIGS from airborne imagery sources (theater, tactical and national airborne collection), commercial imagery sources, NTM, and other sources.

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(U) **Common Imagery Processor (CIP):** A system for processing imagery from airborne sources during the collection and processing phase of imagery collection, prior to its acceptance and use by the Common Imagery Ground/Surface System in the exploitation and production environment.

(U//FOUO) **Common Support Application (CSA):** CSAs provide the architectural framework for managing and disseminating information flows throughout the system, and for sharing information among applications. CSAs contain facilities for processing and displaying common data formats and for information integration and visualization.

(U) **Community Online Intelligence System for End-Users and Managers (COLISEUM):** An automated Intelligence Community production/requirements management system operating at the TS/SCI level. Coliseum provides a community-wide automated system to register and validate user requirements, de-conflict and task intelligence production, and provide a mechanism to manage intelligence production. It consists of five modules for registering and validating requirements, tasking and scheduling production, and managing overall production activities. COLISEUM runs as an application on JDISS.

(U) **Compressed Aeronautical Chart (CAC):** A stand-alone system, developed and maintained by the Navy, located at NIMA St. Louis that converts ARC Digitized Raster Graphics (ADRG) format charts to the Navy CAC format, for distribution.

(U) **Computer-to-Plate (CTP) Systems**: These highly automated systems produce printing plates directly from digital files, are capable of high throughput, and minimize operator intervention and material handling. CTP systems reduce consumables, capital expenditures, facility space, and reduce the generation of waste by-products. The CTP system provides automated plate handling, high-productivity, high-quality plates. CTP robotics retrieve blank plates, carry the plates through laser imaging and on to the plate processor for development. The networked components include one SGI Challenge DM server, three scanners, seven workstations, one Redundant Array of Inexpensive Disks (RAID) storage device, a tape archival system, three ink jet color plotters, and one CTP plate-making machine.

(U) **Data Architecture View:** The relationship and definition of all data that are used by, and influence, the other three architecture views - operational, systems, and technical.

(U//FOUO) **Demand Driven Direct Digital Dissemination (5D):** 5D is a legacy system that provides imagery product dissemination. 5D provides a National Imagery Transformation Format -Level 3 compliant imagery product server capability to numerous national and tactical server sites.

(U) **Data Services Segment (DS/S):** Provides communications and data management services for the Digital Production System. DS/S also houses the MC&G database, which is the central data store for feature, terrain, and bathymetric data used for MC&G production

(U) **Data Store:** A facility for storage of imagery, imagery intelligence, collateral information, and geospatial information. Data Stores will be located at CIGSS sites, national overhead source sites, and exploitation sites. The data stores also include commercial imagery vendor storage, NIMA reproduction and replication inventories, management databases, and the infrastructure database.

(U) **Defense Information System Network (DISN):** USIGS relies primarily on the Defense Information System Network (DISN) for backbone communications services, and a variety of theater and tactical communications systems for interconnecting users with libraries. Information Delivery services will provide electronic transfer of USIGS data among storage repositories (libraries), and direct dissemination communications from an input point to selected user facilities.

(U) **Defense Messaging System (DMS):** Secure message processing and dissemination system.

(U) **Deployable Imagery Manipulation and Enhancement System (DIMES):** A web-based solution that compensates for bandwidth constraints. It requires the passing of only the macro file and associated annotation files from the producer (480th Intelligence Group) to the user (49th Fighter Wing) so F-117 mission planning and target familiarization image products can be regenerated at the user site.

(U) **Digital Image Georeferencing System:** A legacy exploitation system that analyzed and developed georeferenced coordinate data from Spot/Landsat-type photography.

(U) **Digital Production System (DPS) Interface Server:** Provides a single interface point of the control of both imagery and non-imagery data exchange between the NIMA DPS segments and new or existing non-DPS segments for the electronic exchange of data between heterogeneous platforms connected to separate communications networks.

(U) **Element:** See USIGS Elements.

(U) **Enhanced Analyst Client (EAC):** A web-based, HTML user interface to IESS that supports softcopy image exploitation. EAC manages softcopy tasks within queues; presents thumbnail previews of images; allows users to manually create/complete ad hoc softcopy tasks; retrieves reference data from IESS; retrieves and displays reference imagery from the library, and retrieves and transfers Graphical Situation Display (GSD) overlays to the softcopy workstation/IEC. EAC was developed to replace the IESS portion of the IESS-IDEX II interface (IF20K22) and related functionality with USIGS/UIP-compliant specifications (GIAS/GIXS). In addition to the IESS interface, EAC also interfaces with the GSD data store, NIMA Library, and IEC workstations.

(U) **Geodesy and Geophysical Enhanced Production System (GGEPS):** The principal computer system supporting the geodesy and geophysics program, supporting the survey, gravity, and satellite geodesy support projects. GGEPS hosts the DoD Gravity Library Database and supports the computation of all gravimetric data products derived from this data. It also supports OMNIS software. The unclassified node supports the reduction of geodetic survey data. The GGEPS is also host to the gravity and survey portions of the Geodetic Information Management System (GIMS). The gravity portion of GIMS is on the collateral secret node of GGEPS and the survey portion on the unclassified node. The GGEPS is the only system in NIMA that is capable of generating the gravity products that support B-2 and F-117 inertial navigation systems and the Navy's Trident program. The GGEPS is a client/server system.

(U) **Geodetic Data Applications System II (GDAS II)**: Provides the tools to determine the datum, projection, and accuracy of paper maps and charts for which this information is unknown. These parameters are required for accurate geospatial feature extraction and are particularly significant for the hydrographic programs. The bulk of hydrographic sources are foreign-produced paper charts whose features must be digitized to include in NIMA database layers. GDAS II permits collection of stereo control points at the time of adjustment. GDAS II performs photogrammetric map and chart evaluations by measuring points on both a manuscript and hardcopy stereo model sources and then comparing coordinate sets statistically. The subsystem captures latitude, longitude, and height for photogrammetrically derived points, as well as raster images of the points on a map taken from the GDAS II map table monitor.

(U) **Geodetic Information Management System (GIMS):** GIMS consists of three components: GIMS-Survey, GIMS-Gravity, and the GIMS-Library. GIMS-Survey and GIMS-Gravity are located in St. Louis and are hosted on Geodesy and Geophysics Enhanced Production System (GGEPS) hardware on a Secret stand-alone LAN. GIMS-Library (also known as the Geodetic Library Database - GLDB) is located in Bethesda on an unclassified stand-alone LAN that also includes the Digital Geodetic Support System (DGSS). GIMS users required the integration of the data in the three GIMS components into a USIGS-compliant common structure and the establishment of connectivity between the systems via the Secret Collateral Enterprise Network (SCEN). Since GIMS-Survey and Gravity are

hosted on GGEPS hardware and GIMS-Library is connected to DGSS, this will require coordination with GGEPS and DGSS. GGEPS (including GIMS-Survey and GIMS-Gravity) will be capable of access via the SCEN.

(U) **Geospatial and Imagery Access Service (GIAS):** GIAS provides client service access for the discovery and retrieval of data holdings in archive and dissemination compliant libraries for any product whose catalog and query metadata include imagery, imagery products, imagery intelligence, and geospatial products and information. In addition, GIAS provides capabilities that allow users to request tailored (e.g. compressed, converted) data from the libraries and to submit data (e.g. reference images and opaque files) for storage to the libraries. The GIAS serves both NIMA internal and external customers in support of their missions.

(U) **Global Combat Support System (GCSS):** Provides end-to-end information interoperability among combat support functions and command and control functions. GCSS focuses on the need to integrate applications and on the underlying communications and computing infrastructure. It provides a suite of common applications that employ DII COE and SHADE.

(U) **Global Command and Control System - Integrated Intelligence and Imagery (GCCS-I3):** Provides the warfighter with a fused, real-time, picture of the battle space and the ability to order, respond, and coordinate horizontally and vertically to fulfill the mission in that battle space. It is a collection of applications for military intelligence and imagery assets at the secret and SCI level that supports planning, deployment, and execution for US forces and providing information and direction needed to complete the mission. GCCS is based on the concept of a COE, with all hardware and software systems meeting interoperability and compatibility standards. Currently, the GCCS hardware infrastructure is in a client-server environment incorporating UNIX-based servers and client terminals and workstations operating on a local area network. Main sites will have at least two application servers, providing desktop services and hosting most applications and an automated message handling system, and one database server, which will hold all major databases and some applications.

(U) **Global Positioning System (GPS) Monitoring Station Network (GPS MSN):** Comprised of the GPS (NIMA) Network Control Center and NIMA-operated GPS Automated Data NIMA Monitoring Stations. These monitor stations measure signals from the GPS space vehicles, which are incorporated into dynamic orbital models for each satellite. GPS space vehicle precise ephemeris and timing data from these monitoring stations is combined with data from the five USAF tracking networks stations in the GPS Master Control Facility. The GPS Master Control Facility corrects the GPS network location data to maintain the required accuracy. The GPS is a critical safety of flight/safety of navigation system supporting global air, land, and sea navigation.

(U) **Global Positioning System Network Control Center (GPS NCC):** Links the NIMA network of GPS Automated Data NIMA Monitor Stations (ADMS) within the US. It includes a GPS master control facility that maintains station/network status and operation of the automated stations, and provides consolidated GPS space vehicle timing and precise ephemeris data.

(U) **Global Positioning System /Orbit Mensuration and Navigation Improvement System (GPS/OMNIS):** Supports the end-to-end process for acquiring and preprocessing GPS data to produce the precise post fit ephemeredes and clock states. Feeds that data real-time to the GPS Master Control Facility for inclusion in processes for integrity monitoring and signal-in-space accuracy improvement.

(U) **Global Positioning System Sled Track Survey Systems (GSTSS):** Provides a rapid method for precise positioning and profiling of a high-speed test track. A rolling GPS-based automated kinematic survey system rapidly profiles the test track to the sub-centimeter accuracy required before and after each test run.

(U) **Global Positioning System Survey Receivers:** Supports the Geodesy and Geophysics survey mission. Hundreds of these NIMA-maintained devices determine latitude, longitude, and vertical position in support of geodetic surveying and establishing airfield positions.

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(U) **Hardcopy Exploitation Segment (HE/S):** A Mark-85 Digital Production Segment that performed geopositioning on hardcopy NTM Imagery for Geospatial Production.

(U) **Hardcopy Reconstruction Unit (HRU):** The Hardcopy Reconstruction Unit (HRU) is a custom developed hardware component of the DE that produces high-resolution film products from softcopy imagery. These film products, produced using a custom dry process film media, are exploitable on a light table.

(U) **Image Data Controller Type A (IDC-A):** Generates MC&G reduced-resolution data sets (RRDS) for NIMA/GI users by inputing compressed imagery from tape, creating the RRDS, and writing the original image and RRDS to RAID.

(U) **Imagery Data Exploitation System II (IDEX II):** An automated, soft-copy imagery exploitation system that allows the analyst to exploit imagery in digital form with on-line support from the IESS database management system. Capabilities include image enhancement, precise digital mensuration, annotations, stereo viewing, pseudo-color, and full electronic light-table functionality. The IDEX II system provides storage of digital imagery, queue management, high-end softcopy exploitation functionality and digital dissemination of imagery products. Utilized for first, second, and third phase exploitation and reporting, IDEX II supports both the national and military intelligence communities.

(U) **Imagery Support Server Environment (ISSE) Guard:** Provides a trusted interface for the direct digital exchange of email, imagery, text, and multimedia products between systems/networks operating at different classification levels. Protects SCI LAN against unauthorized or malicious penetration.

(U//FOUO) **Information Management Element:** The USIGS Information Management element provides the capability to receive and process customer requirements; order imagery, imagery products, or other information; schedule and assign exploitation tasks; report status; and manage the delivery of information through USIGS. Customer requirements levied on the Information Management element are directed to one (or several) of three other elements: Exploitation, Archive and Dissemination, and Collection and Processing. If collection of new information is necessary, the Information Management element tasks the Collection and Processing element to fill the request. If development of a new product is required, the Information Management element tasks the Exploitation element. If the requirement is for an existing product stored in the USIGS Libraries, the Information Management element tasks the Archive and Dissemination element.

(U//FOUO) **Infrastructure Element:** Infrastructure is the USIGS Element consisting of computing hardware, information interchange, common facilities, platform services, and communications links. This element provides support services such as system engineering, life-cycle support, strategic planning, system test and integration, configuration management, acquisition support, USIGS common applications and operating systems, operation and maintenance (H/W and S/W), computer operations, AIS security, and telecommunications. These support services satisfy the role to maintain existing systems, and to aid in the development and installation of new USIGS systems ensuring compatibility and interoperability with existing USIGS components.

(U) **Integrated Library System (ILS):** provides a data storage capability for metadata of hardcopy holdings and provides standard library services such as checkout of materials, ordering, and cataloging periodicals. ILS is the migration vehicle for the hardcopy holdings currently found in the PM/S and the target migration vehicle for the SA/S metadata concerning geospatial hardcopy film holdings. ILS will use a commercial application called Voyager.

(U) **Intelligence Analysis System (IAS):** Provides the full range of capabilities to support Marine Corps tactical intelligence requirements including situation mapping with multiple overlays and secondary imagery dissemination. IAS uses the Navy's JMCIS as a foundation and then adds Marine-specific applications. IAS provides intelligence

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analysts the means to rapidly process information from national, theater, and tactical sources. IAS Suites host a secondary image dissemination system (SIDS) capability (TC41). Will disseminate/display data from TCO, ATACC, TERPES, via multiple communications paths (TDN, SINCGARS).

(U) **Intelligence Analyst Light Tables.** There currently exist over 125 light table systems providing the intelligence analysts with hardcopy imagery analysis capabilities. These systems are no longer supported by the manufacturer, and are being maintained by cannibalization. A hardware re-capitalization and replacement project is ongoing and scheduled to be complete in FY02, but the light table will remain available for as long as parts can be scavenged.

(U//FOUO) **Intelink:** A web-based Integrated Intelligence Information Service network of shared databases that provide uniform methods for exchanging intelligence among providers and users of intelligence.

(U//FOUO) **INTELNET:** Principally a strategic telecommunications system that provides multimedia wide-area communications connectivity at multiple security levels for IC agencies and their customers. Will replace and/or supplement the wide-area networks currently operated by CIA, DIA, NIMA, NRO, and NSA.

(U) **Large Area Softcopy Exploitation Resource (LASER):** Software exploitation tool that provides a large area search capability that is not available commercially.

(U) **Magnetometer:** A Geodesy and Geophysics survey device used to accurately determine the deflection from true north and magnetic declinations caused by changes in gravity and is used in isogonic charts.

(U) **Mapping, Charting & Geodesy (MC&G) Database:** An interim replacement for the Digital Production System Data Services segment MC&G database. The MC&G database contains geospatial digital features, attributes, and elevation data extracted from national imagery.

(U) **MC&G Information Flow (MCGIF):** A NIMA capability project to manage the implementation and deployment of the MCGIL, to consolidate the geospatial imagery library holdings and databases.

(U//FOUO) **Metropolitan Area Network (MAN):** A network that spans a metropolitan area; generally, a network that spans a larger geographic area than a LAN, but a smaller geographic area than a WAN.

(U//FOUO) **Mission Area Application (MAA):** Mission area applications implement specific end-user requirements or needs.

(U//FOUO) **Modernized Integrated Database (MIDB):** A DIA-maintained database that provides the general military intelligence community with a searchable all-source database of intelligence topics, reports, and target information. A key element of the MIDB is the target database. This warfighter database is maintained with information derived primarily from imagery and imagery exploitation products. The MIDB database structure includes Secret-level and SCI-level components, which share data through an air-gap security interface. Several NIMA systems interface to the MIDB.

(U//FOUO) **Multi-Source Intelligence Toolkit (MINT):** A collection of unique capabilities from MATRIX, MET and Ruler, which are not available commercially. MINT also included commercial exploitation applications bundled as Common Object Request Broker Architecture (CORBA)-compliant services that can be accessed through CORBA-compliant COTS Electronic Tables or other standard interfaces. After developing number of MINT modules and services, the MINT program was restructured to allow industry to determine a set of standard interfaces. Those MINT services that have currently been fielded (MINT releases 1.0, 2.0 and 3.0), will be maintained under the Common Architecture Support Services project.

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(U) **National Area Coverage Data File (NACDF):** A DIA-maintained library that holds imagery collected by national airborne missions.

(U//FOUO) **National Imagery Exploitation System (NIES):** The NIES includes the efforts formerly managed under the IDEX II Replacement Project (IRP). The NIES is made up of five segments (new and legacy), which are integrated together to replace the IDEX II capability. A COTS-based open architecture will replace the existing IDEX II central processing functions and data holding systems. The IDEX II imagery workstations will be replaced with Integrated Exploitation Capability (IEC) workstations to provide a commercial-off-the-shelf (COTS)-based imagery and geospatial exploitation and production capability, and includes a comprehensive suite of workstations, servers, intra-IEC communications and a framework of integrated tools and applications. Delivery services also support imagery delivery between the CILs and other NIMA Libraries. Imagery will be stored in the CIL, and will be accessible via the Information Discovery and Retrieval subproject's Information Access Services common client.

(U) **National Exploitation System (NES):** A single, common software baseline and database structure that supports interface changes, provides an integrated exploitation capability and library interface, supports a collaborative community exploitation environment, and enables workgroup computing, provide geographic-based exploitation support, and provide the historical repository of imagery intelligence reporting.

(U) **NIMA Data System (NDS):** An imagery exploitation and collection research tool that provides automated support for imagery prediction and softcopy plot information for targets. It includes a historical field for imagery derived intelligence on targets and history of imagery coverage of target. NDS supports first- and second-phase exploitation of national imagery.

(U//FOUO) **OC-3:** Optical fiber with 155.52 Mbps transmission capacity, equivalent to 84 Digital System 1 (DS1s) or 3 DS3s; permits rapid passage of an image segment, and an Annotated Imagery Graphic.

(U//FOUO) **OC-12:** Optical fiber with 622.08 Mbps transmission capacity, equivalent to 336 Digital System 1 (DS1s) or 12 DS3s.

(U//FOUO) **Open Geospatial Exchange (OGE) Services Application:** An Open Geospatial Exchange (OGE) Services Common Support Application (SCSA) which delivers imagery or geospatial services that are of interest across one or more other mission domains, such as logistical command and control, weapon system mission planning, or medical logistics management. The OGE (SCSA) therefore requires especially careful cross-domain interoperability engineering by NIMA.

(U) **Order, Entry, and Tracking (OET):** Provides applications to generate, accept, process, track and support the request for, and direct the delivery of, information, products, and services. Requirement formulation, routing, review, validation, approval, and requirement tasking will occur here. OET will determine and/or track satisfaction of requirements, provide accountability, and report on status. Collection feasibility and modeling will also be supported. The OET application interacts with other IGC applications and systems in order to accomplish effective requirement management and throughput accounting.

(U) **Point Positioning Production System (PPPS):** Produces the point positioning database. Hardware consists of commercial off-the-shelf components with the exception of two custom hardware printed circuit boards required to interface to the DS/S wide band and narrow band networks. PPPS comprises four computer systems connected to two local communications networks. The PPPS software is a combination of COTS, custom, and heritage components. There are a total of eight CPCIs in PPPS, written in FORTRAN and C, and running on the UNIX, VMS and VxWorks operating systems.

(U//FOUO) **Production Support Systems.** NIMA maintains specialty systems to meet production support requirements that provide unique capabilities not required by the general USIGS user. These systems are:

- The Geodetic Information Management System (GIMS) provides a consolidation of modernization efforts that have similar system requirements: The Satellite Records Database, the Gravity Information Archival and Retrieval system, and the DoD Geodetic Library.
- The Analyst system provides an office suite of hardware and software that is used to analyze imagery and provide high visibility reports to the White House.
- The Deployable Imagery Manipulation Enhancement System (DIMES) is a web-based solution that passes target image products as a compressed micro file with associated annotation files from the producer (480th IG) to the user (49th Fighter Wing) for F-117 mission planning and target familiarization image product regeneration. DIMES is planned for incorporation into the IPL program.

(U) **Remote Replication System (RRS):** Provides distributive, on-time, custom products to NIMA customers through use of COTS and GOTS software to reproduce high quality color maps and charts in a variety of formats. Functionality includes: color reproductions of maps, charts, and special products, custom annotations added to standard base maps, mosaicing of adjacent maps together to produce one seamless map, merging of NIMA digital data sets (raster and vector), custom maps created to order, output types include poster paper, 8mm data tape, and CD-ROM.

(U//FOUO) **Requirements Management System (RMS):** Initiates, specifies, reviews, approves, updates, and monitors imagery requirements. Provide imagery tasking data to overhead or airborne collection, production and distribution organizations, well as exploitation and reporting centers.

(U//FOUO) **Segment 18:** See Appendix E.

(U) **Source Preparation Segment (SP/S):** Digital production segment that supports geospatial production by identifying, evaluating**,** and selecting source materials and preparing source packages for subsequent geospatial exploitation and product finishing efforts.

(U**) Special Mensuration Services (SMS):** SMS will migrate the EXPIRT functionality, which operates with the MATRIX GOTS ELT only, to a more open architecture that will interface to COTS electronic light tables. See Appendix E.

(U//FOUO) **Stand-Alone Geodesy and Geophysics (G&G) Systems.** One of the NIMA responsibilities is support the worldwide geodetic and DoD field survey missions. NIMA is the lead for maintenance of the world gravity and magnetic field models, and supports the accuracy determination, operation and maintenance of the Global Positioning System (GPS). The GGEPS is a two-part system, operating at the classified and unclassified levels that host many of the survey, physical and satellite geodesy software tools, services, and databases. There are no plans to migrate the remaining stand-alone Geodesy and Geophysics (G&G) systems identified in the Exploitation Evolution Diagram because of their imagery independence and their unique of their functionality in support of the GPS and geophysical field survey missions. These G&G stand alone systems include the NIMA GPS Monitoring Stations Network (MSN), GPS Orbit Mensuration and Navigation Improvement System (GPS/OMNIS), Automated Data Monitor Stations (ADMS), GPS Sled Track Survey System (GSTSS), GPS Survey Receivers, Differential GPS Reference Stations (DGRS), Geodetic Astrolabe, Total Station Electronic Distance Measuring System (TS EDMS), and Relative and Absolute Gravimeters and Magnetometers.

(U) **Total Station Electronic Distance Measuring System (TS EDMS):** Provides a complete, integrated, man-portable surveying system in support of the geodesy and geophysics survey mission.

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(U//FOUO) **United States Imagery and Geospatial Information Service (USIGS):** The extensive network of organizations, people, leadership, training, doctrine, standards, procedures, hardware and software that provides our nation with fused imagery, imagery intelligence and geospatial information needed to achieve information superiority. The USIGS provides capabilities for integration, management, collection, exploitation and production, dissemination and archive, and infrastructure for this information. Organizations, which have some level of interaction with USIGS (but are not part of the DoD and IGC), are considered participants in USIGS if they adhere to the technical and system standards.

(U//FOUO) **USIGS Elements:** USIGS Elements define the highest level functional breakdown of activities necessary to produce imagery, imagery intelligence and geospatial information. The USIGS Elements include Information Management, Archive and Dissemination, Collection and Processing, Exploitation, and Infrastructure.

(U//FOUO) **USIGS Enterprise Requirements Specification (UERS)**: UERS is the validated requirements baseline for the USIGS. UERS is the basis for what constitutes the USIGS as a system, and contains the requirements used to develop future capabilities. Additionally, UERS is intended to provide comprehensive system-level requirements for the USIGS. Allocated UERS requirements are binding on the NIMA program offices. NIMA program offices are responsible for deriving segment-level requirements from allocated UERS requirements, and for developing contractual documents for implementing those requirements.

(U//FOUO) **USIGS Libraries:** See NIMA Libraries.

(U//FOUO) **USIGS Operations**: A collection of software, firmware, and hardware elements that controls the execution of computer programs and provides such services as computer resource allocation, job control, input/output control, and file management in the USIGS.

(U) **Vector Product Format/Product Standard (VPF/PS):** Geo-relational data structure designed for the provision of vector products on CD-ROM media and manipulated in geographic information systems environments. The VPF format utilizes a suite of user system oriented standards encompassing VPF digitizing conventions, tiling, and feature attributing and coding.

(U//FOUO) **Washington Area Library Architecture (WALA):** The WALA for imagery analysis project will replace the existing IDEX II workstations with IEC workstations to provide a COTS-based, open architecture, imagery and geospatial exploitation and production capability. The IDEX archive will be replaced with a feed from the NIL or the CIL.

(U) **Workflow Management:** Integrates the workflow management applications that manage and support geospatial and imagery analysis and production. WFM supports the assignment and management of exploitation and production workflow activities, the staging of requisite imagery and source materials, and initiating product or information dissemination. The WFM function interacts with other IGC applications and systems in order to accomplish effective workflow management and throughput accounting.

(U) **Worldwide Navigational Warning System (WWNWS).** The WWNWS supports the maritime safety of navigation mission. Along with the Global Maritime Distress and Safety System (GMDSS), the WWNWS supports the Maritime Broadcast Warning desk, providing 24 hour per day, seven days per week time critical warning messages to sailors. These two systems link via the Pentagon to a satellite based radio frequency broadcast system, and provide warning and informational messages to sailors and other stations worldwide. The NIMA Maritime Broadcast Warning desk supports the US mission to provide this information to sailors for the Atlantic and Pacific areas of responsibility, and provides this information to the other worldwide partners. The WWNWS also provides information to the NSS. Both the WWNWS and the GMDSS are based on IBM Windows personal computers. The WWNWS is scheduled for replacement by IEC workstations in FY06.

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(U) Appendix D

References

(U) Department of Defense documentation:

- DoD Directive 5000.1, *The Defense Acquisition System, 23 October 2000*, 4 January 2001.

- DoD Directive 8000.1, *Defense Information Management (IM) Prog*ram, 8 October 1997.

- DoD Instruction 5000.2, *Operation of the Defense Acquisition System, 23 October 2000*, 10 June 2001.

- DoD Instruction 8320.1-M, *Data Administration Procedures*, April 1998.

- DoD Regulation 5000.2-R, *Mandatory Procedures if Major Defense Acquisition Programs (MDAP) and Major Automated Information Systems (MAIS) Acquisition Programs*, June 2001.

- Defense Information Systems Agency, *Defense Information Infrastructure (DII) Common Operating Environment (COE) Integration and Runtime Specification (I&RTS)*, Version 3.0, July 1997.

- DoD C4ISR Architecture Working Group, *C4ISR Architecture Framework*, Version 2.0, 18 December 1997.

- DoD*, Joint Vision 2010*, undated.

- ASD (C3I), *DoD Joint Technical Architecture*, Version 3.0, 15 November 1999.

- *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.

- CJCS Instruction 3170.01A, *Requirements Generation System*, 10 August 1999.

- CJCS Instruction 6212.02B, *Interoperability and Supportability of National Security Systems and Information Technology Systems*, 8 May 2000.

(U) NIMA Documentation:

- National Imagery and Mapping Agency, *Strategic Plan*, 2001 (draft).

- National Imagery and Mapping Agency, *Information Technology Strategic Plan*, December 2000.

- National Imagery and Mapping Agency *Operations Directorate Vision*, September 1998.

- National Imagery and Mapping Agency, *Enterprise Network Description and Requirements Document*, 3 April 2000

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- National Imagery and Mapping Agency, *Program Implementation Document (PID),* July 2000.

- National Imagery and Mapping Agency, *AT (Directorate) Management Plan,* v. 1.0, September 2000.

(U) US Imagery and Geospatial Information Service (USIGS) Documentation:

- USIGS Architecture Framework-B (UAF), 23 June 1998

- USIGS Objective System Architecture Description (UOSAD), 3 February 2000

- USIGS Systems Engineering Management Plan (SEMP), 23 May 2000.

- USIGS Technical Architecture (UTA), 26 January 1999

- USIGS Conceptual Data Model, 5 May 1998

- USIGS Configuration Management Plan, October 1999

- USIGS Enterprise Requirements Specification (UERS), Revision C, 11 April 2001.

- USIGS Master Schedule, continuous update, as required

- USIGS Test & Evaluation Master Plan, January 2000

- USIGS Interoperability Profile, June 1999

- USIGS Functional Manager's Guidance, October 2000

- USIGS Information System Concept of Operations 2010, September 2000.

- USIGS Operations and Support (O&S) Master Plan, 16 December 2000 (draft).

- USIGS Re-baseline Information Brief, 23 May 2001.

(U) Other Documentation:

- Deputy Secretary of Defense/Director of Central Intelligence *Joint Intelligence Guidance* (annual)

- Director of Central Intelligence Directive (DCID) 6/3, *Protecting Sensitive Compartmented Information within Information Systems*, 5 June 1999 (U).

- Central Intelligence Agency, Office of Advanced Analytic Tools, *Intelligence Community Collaboration Baseline Study*, December 1999 (U).

- Central Intelligence Agency, Office of Advanced Analytic Tools, *A Strategy for Implementing a Collaborative Environment: 2000-2005*, January 2000 (U/FOUO).

- Imagery and Geospatial Community, *IGC Operation Vision into the 21st Century*, Draft, December 1997

- Imagery and Geospatial Community, *IGC 2010 Concept of Operations*, February 2000.

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