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SECTION 1

TECHNICAL PROPOSAL FOR MODERNIZING THE PRINTING AND PHOTOGRAPHY GROUP ETECS OPERATION

1 INTRODUCTION

This technical proposal outlines the Electronic Text Editing and Composition (ETECS) services that are currently provided by the Printing and Photography Group (P&PG) to its customers. The hardware and software systems in place within ETECS used to produce P&PG published products are described.

Secondly, a view of the origin, charter, and role of the MITRE Corporation as a Federally Funded Research and Development Center (FFRDC) is outlined. To provide a more detailed view of MITRE as a resource to assist P&PG in their ETECS modernization planning, this proposal includes a list of MITRE projects that are in place now or have been completed in support of Agency components.

Thirdly, the proposal outlines a work plan which, if adopted by P&PG, will modernize ETECS capabilities and will satisfy expressed needs of P&PG customers. The work plan is based on preliminary discussions with and information provided by P&PG Pre-press staff. These discussions focused on ETECS configuration limitations, constraints, and known requirements for system improvements. Additional requirements were identified via a survey conducted by P&PG staff. The survey was completed in response to a P&PG Management by Objectives (MBO) task, and requirements were documented in accordance with Milestone 2 of the ETECS Electronic Communications Architecture and Network MBO statement. Finally, work performed by MITRE on related Agency projects contributed to the understanding of the P&PG workflow.

1.1 BACKGROUND - ETECS

The ETECS system, as currently configured, provides composition, page markup, and typeset formatting of documents submitted by customers to P&PG. These documents may be originated by intelligence analysts or other customers using a variety of customer-owned input devices, methods and media.

When the original text has been completed by the analyst and has been approved for publication, it is submitted to ETECS for page markup and composition. This operation is commonly referred to as "front-ending" or

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as the "front end" to the printing operation. Equipment used to support the front-ending operation is the ATEX system, a PDP-11/34 processor with up to 16 display stations attached per processor. At present, there are four separate ATEX systems, each configured to operate in connection with specific input devices or information transmission media.

The following section describes the ETECS workflow and the specific equipment configuration installed within the Center to compose and typeset documents and publications.

1.1.1 ETECS - Headquarters (Room GJ56)

For Wang-originated documents prepared by intelligence analysts or other P&PG customers, original text may be submitted to ETECS via Wang formatted diskettes. These diskettes are forwarded to the ETECS Center by the customer and are processed by a Wang system installed in P&PG facilities located in Room GJ56. The Wang system in GJ56 has an electronic interface for information transfer from the Wang to the ATEX 2 system.

As an alternative to customer-originated text submitted to ETECS via Wang formatted diskette, text may be created on customer-owned Wang systems, transmitted electronically to the Wang system installed in the ETECS facility and then transferred to the ATEX 2 system for composition. As an alternative to the Wang-to-Wang text exchange, text may be submitted electronically from customer-originated Wang Alliance systems to the OIT VM host processor and from the VM host to the ATEX 3 system.

Some customers originate text using microcomputers (other than Wang) and popular word processing software such as Microsoft Word, Wordperfect, Wordstar, or other customer-licensed systems. Like the Wang, these systems may generate text on floppy diskettes for submission to ETECS. Text input recorded on diskette by the microcomputer is converted at the ETECS center using a Shaftstall media conversion system. The Shaftstall strips off all formatting codes contained on the input medium, and produces a file readable by the ATEX 1 system.

When the ETECS composition and typeset formatting input step has been completed, the output step of the Pre-press operation (input to the printing operation) is completed using Page Image Processing (PIP) equipment. Several models are available; outputs can be produced in various forms, e.g., resin coated (RC) high quality film, 70 millimeter film, or plain paper.

1.1.2 ETECS - P&PG Main Plant

Within the P&PG main plant facility, ATEX equipment similar to that located in GJ56 may be used to compose and typeset textual information.

Should the document contain both text and graphics, XYVISION equipment is used to compose this type of document.

At the main plant, text information may be input to the ATEX 0 system via an Optical Character Reader (OCR). In addition, graphics information may be input via a graphics scanner to XYVISION composition equipment. At this location, both the ATEX and XYVISION composition and typeset formatting equipment are interfaced to PIP equipment similar to that available in GJ56 at Headquarters. A XITRON switching device is used to direct output from the ATEX equipment to the appropriate page image processor for the type of output required.

1.2 BACKGROUND - THE MITRE CORPORATION

This section provides information that describes the origin, charter, and role of the MITRE Corporation as a resource serving government agencies. In addition to this general information describing the MITRE Corporation, selected projects completed by MITRE technical staff in support of Agency sponsors are described.

MITRE was created in 1958 as a not-for-profit corporation chartered in the public interest. Since 1958, MITRE has served the public interest as a planning, engineering, and advisory resource to its sponsors. MITRE is neither a part of industry nor a part of government; it operates as a link between these two entities. As a not-for-profit corporation, MITRE supports Defense and Intelligence communities and government agencies at the federal, state and local levels.

MITRE plays a special role in supporting computer systems acquisitions. Manufacture of hardware and software for sale is prohibited by charter; MITRE therefore is free from potential conflicts of interest that otherwise might arise from privileged access to sensitive or proprietary information.

1.3 MITRE SUPPORT TO AGENCY SPONSORS

MITRE is currently providing systems engineering and technical support to the Agency on a variety of projects, and has a cadre of systems engineers that are badged and are familiar with Agency computer-based systems. MITRE technical staff are supporting Agency efforts including strategic planning, workstation architectures, applications for intelligence analysts, database design, network management, computer systems relocation, and security standards. Selected Agency projects are described below.

- The Office of Current Production and Analytic Support (CPAS)

  For CPAS, MITRE has recently completed the design and implementation of a demonstration system for dissemination of intelligence information in softcopy form. The system, referred to as EDS, is designed to demonstrate the feasibility of producing and disseminating intelligence information products to consumers.

  The demonstration system employs a multimedia approach; information can be displayed as combinations of text, graphics, cartographics, images, voice and motion video. EDS has been implemented using a SUN Microsystems workstation and has been demonstrated to the intelligence community to assess EDS concepts and to solicit comments and suggestions regarding the EDS demonstration implementation.

- Directorate for Science and Technology (DS&T)

  MITRE provides both strategic and near-term ADP planning support to the Directorate of Science and Technology (DS&T). Strategic ADP planning support is being provided to NPIC, the Office of Research and Development (ORD) and to the front office of DS&T.

- National Photographic and Interpretation Center (NPIC)

  NPIC is upgrading the computing and communications facilities of the NPIC Data System (NDS). MITRE is involved in the preparation of the RFP for the upgrade.

  In addition, MITRE is providing support for various aspects of imagery exploitation, including the evaluation of work in the research and development community, the specification of requirements for a softcopy workstation evolution capability and the study of the capabilities of various exploitation management systems.

- The Office of Imagery Analysis (OIA)

  OIA is currently expanding the capabilities of its network of workstations to enhance processing facilities such as word processing, spreadsheets, desktop publishing, and image processing. Plans are underway to improve access to community information systems such as CAMS and NDS, and to other information systems at Headquarters such as SAFE and VM. MITRE is the systems engineer for defining the OIA architecture, and to assist with the system acquisition and installation process.

- The Office of Global Issues (OGI)

  For OGI, MITRE is providing engineering support toward the design and development of a Narcotics Analysis Database. The database will be used for tracking and analyzing linkages among traffickers, organizations and governments. The database will provide data storage and retrieval capabilities on individuals, groups and organizations involved in drug trafficking and by automating the analysis of linkages among individuals and organizations in a manner that will support intelligence requirements.

  MITRE will perform the requirements analysis, the preliminary design work, and the system sizing to produce a Request for Proposal. The MITRE products will include a conceptual database model, a high level functional requirements description, and a Statement of Work (SOW) to be used in the competitive procurement of the system.

- Office of Leadership Analysis (LDA)

  MITRE is providing support to LDA which involves design of an interactive system (DOSSIER) for storing and retrieving biographical textual intelligence information and indexes to pictorial data. DOSSIER support includes concept of operations, functional requirements, database design, and user interface.

- The Office of Information Technology (OIT)

  MITRE is providing systems engineering and technical support to OIT. The support involves planning and assisting the New Building Program Office in the relocation of Agency computing facilities from five centers to two new computing centers.

  In addition, MITRE recently completed a project to review existing and planned OIT network management capabilities and customer service procedures. Major objectives of the study were to identify any weaknesses and deficiencies in network capabilities and procedures, and to make recommendations for improvements. To complete these objectives, MITRE interviewed key staff within OIT engineering, operations, and customer service organizations. In addition, interviews were conducted with Office of Communications (OC) staff and with supporting contractors.

- Office of Security (OS)

  For OS, MITRE is developing an Information Security strategic five-year plan. Tasks include a review of current information security

activities and a review of security requirements. In addition, key Agency staff were interviewed to define security issues and to develop a set of strategic goals and objectives to serve as a basis for the plan. The plan will describe security initiatives, and programs, resource requirements, and a schedule for implementation.

1.2.2 MITRE Facilities

The MITRE Corporation has established sponsor-accredited Sensitive Compartmented Information Facilities (SCIFs) with offices and laboratory space available at both McLean, Virginia and Bedford, Massachusetts. In addition, the Corporation has offices located in an accredited SCIF in Rosslyn, Virginia. Approved information-handling systems are currently available at each of these locations for the preparation and secure storage of project documentation.

SECTION 2

2 ETECS PROBLEM STATEMENT

This section identifies constraints and limitations of the ETECS equipment currently in operation within P&PG. On the basis of discussions with P&PG staff, review of MBO milestone 2 - (Determine future requirements by meeting with customers and determining their plans regarding electronic document production), contacts with other P&PG customers, together with familiarity with other Agency office requirements for printing and publishing, P&PG services and facilities are deficient in the following ways:

1. ETECS provides a one-way electronic interface for transfer of information between customer-owned workstations and the ETECS facility. This one-way information flow limits the extent to which documents can be created, edited and proofed in soft-copy form. The schedule for publication turnaround is severely constrained by this limitation. The production cycle for initial and interim proofing is too long and needs to be shortened.

2. Documents are created by customers using a variety of workstations and word processing software products. The information is downloaded to the ATEX equipment, composed and typeset in a format specific to the ATEX equipment. The composed database is stored on the ATEX system, and should the originator want a copy of the database, it is returned in ASCII format on magnetic media. The database cannot be transformed easily from magnetic tape to workstation for subsequent access by the originator. A capability to return databases to customers in uncomposed format is needed.

3. The current ATEX display station is a single purpose device, and is attached to the ATEX PDP-11/34 system for text composition and page layout operation only. The display station is a "dumb" video display without many of the features common to other multi-purpose PC-based workstations. Multi-purpose workstations would provide new capabilities for P&PG staff and P&PG customers.

4. The ETECS facility has no desktop publishing capabilities. ETECS offers no support for direct attachment to customer-provided desktop publishing equipment.

5. ETECS has no automated facilities that can be accessed to link text, graphics, illustration or photographic material electronically.

SECTION 3

3 WORK PLAN

Section 1 described the MITRE Corporation, its origin, charter and role as a planning, engineering, and advisory resource to the Defense and Intelligence communities. Section 2 identified the major problems with ETECS facilities and services. This section describes the MITRE work plan to assist P&PG in planning the modernization of the Pre-press operation.

3.1 TASK 1 - ETECS REQUIREMENTS ANALYSIS

To gain insight into the ETECS modernization effort, a clear understanding of the existing ETECS system is needed. To develop this understanding and to establish a baseline for the modernization effort, MITRE will validate and prioritize current needs. In addition, MITRE will work with P&PG to identify and examine new requirements and future P&PG needs. This work will include reviewing publishing and printing capabilities and resources installed in other Agency offices. This will ensure that the P&PG modernization effort considers:

- Existing Agency publishing requirements and configurations
- Interfaces with user-owned systems and user requirements
- Long range Agency goals and objectives

A functional requirements specification will take the results from MBO Milestone 1 - (Document current communications capabilities), and Milestone 2 - (Determine future requirements by meeting with customers and determining their plans regarding electronic document production), and will enhance these capabilities and requirements as necessary to complete the requirements analysis. This broad requirements review and analysis will be conducted in an Agency-wide context, so that the technology assessment and acquisition planning will be comprehensive and complete.

The functional requirements specification will be used to develop a concept of operations plan. This plan would provide a structured framework to serve as a guide for P&PG ETECS modernization, i.e., it would describe how P&PG staff and P&PG customers would use the new ETECS system. This concept of operations would include the flow of publications material from originator to ETECS and from ETECS to the originator. Any impact to the current workflow would be identified and documented. The concept of operations would include only generic printing and publishing architecture;

Not just ETECS

specific design alternatives will be driven by the technology assessment phase of the project. The concept of operations will satisfy MBO Milestone 3 - (Assess current capabilities in light of future and projected requirements).

3.1.1 Task 1 Deliverable

The Task 1 deliverables will be MITRE documents to include:

1. An ETECS functional requirements specification, and

2. A new ETECS Concept of Operations

3.1.2 Task 1 Level of Effort

The level of effort for Task 1 is estimated to be 3 staff-months.

3.1.3 Task 1 Period of Performance

The period of performance for Task 1 is from 15 May 1989 through 15 July 1989.

3.2 TASK 2 - ETECS TECHNOLOGY ASSESSMENT

Based on completion of task 1, MITRE will perform a review and assessment of technology and Commercial Off-the-Shelf (COTS) products that would satisfy the requirements and concept of operation as developed and described in section 3.1 above.

The assessment will consider available printing and publishing technologies, including workstation desktop publishing, and printing and publishing operation in local area networking (LAN) environments. The potential for installation of new P&PG workstation and LAN capabilities with bridge connections to customer-installed LAN and desktop publishing equipment will be investigated. In addition to technical considerations, review and analysis of pertinent operational, economic and security concerns will be addressed.

The results of this task will be a recommendation for alternative Pre-press capabilities to augment or replace existing ETECS equipment, and can be used by P&PG to satisfy MBO Milestone 4 - (Identify alternative configurations to meet requirements).

3.2.1 Task 2 Deliverable

The task 2 deliverable will be a MITRE report that documents the technology assessment in the context of the ETECS requirements specification and the new ETECS concept of operations.

3.2.2 Task 2 - Level of Effort

The level of effort for task 2 is estimated to be 2 staff-months.

3.2.3 Task 2 - Period of Performance

The period of performance for task 2 will be from 1 July through 15 August 1989.

3.3 TASK 3 - ACQUISITION PLANNING AND SUPPORT

Based on the results of the technology assessment and recommendations, two options are open to P&PG for modernizing ETECS pre-press facilities.

1. If the review of available printing and publishing technologies results in a recommendation for replacement or upgrade of the ETECS system configuration, MITRE would provide P&PG with acquisition support for a competitive procurement, namely RFP preparation, including the preparation of the SOW and equipment specifications. In addition, MITRE would support selection of a development contractor to design, implement, and deliver the ETECS upgrade or replacement system.

2. Should the results of the technology review lead to a recommendation to acquire COTS hardware and software technology to serve as a baseline prototype, MITRE would prepare an independent cost estimate for a system to include COTS hardware and software representative of that needed for ETECS modernization. In addition, MITRE would assist P&PG in the procurement of the prototype equipment and serve as advisor to P&PG and to the Office of Logistics (OL) to ensure satisfactory in-house support for continued operation and enhancement of the prototype configuration. Attachment 1 is a representative LAN-based ETECS COTS configuration that could be acquired and installed in a prototype environment.

The results of task 3 (either option as outlined above) can be used by P&PG to respond to MBO Milestone 5 - (Prepare proposals for reconfiguration of Pre-press communications architecture with discussion of alternatives and recommended approach), and in response to Milestone 6 - (Install and implement reconfiguration).

3.3.1 Task 3 Deliverable

Option 1 - Competitive Procurement. This deliverable will be a SOW for the acquisition of hardware and software to modernize the ETECS system.

Option 2 - COTS Prototype. This deliverable will be a report that identifies the COTS hardware and software (including LAN networking devices), and describes the functions and capabilities of the prototype system.

3.3.2 Task 3 Level of Effort

Option 1 - Competitive Procurement. The level of effort for this option is estimated to be 4 staff-months.

Option 2 - COTS Prototype. The level of effort for this option is estimated to be 4 staff-months.

3.3.3 Task 3 Period of Performance

Option 1 - Competitive Procurement. The period of performance for this option is from 15 August through 15 December 1989.

Option 2 - COTS Prototype. The period of performance for this option is from 15 August through 15 December 1989.

SECTION 4

4 GOVERNMENT ASSISTANCE

Government assistance will be required to provide point of contact for interviews and meetings with Agency staff. In addition, government assistance may be required to provide access to documentation that describes P&PG facilities, procedures, and support.

SECTION 5

5 MITRE TEAM ASSIGNMENTS

The project leader for this project will be Mr. Richard Smith. Ms. Elaine Mattair will serve as task leader, with support from other MITRE staff as appropriate. Personnel assigned to the MITRE Printing and Publications Departments located in McLean, VA and Bedford, MA may be asked to assist the MITRE project team in support of this effort. Attachment 2 includes copies of resumes for the principals to be assigned to the project.