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TECHNICAL REPORT

For The

Cargo Movement Operations System (CMOS)

Reviw of System/Segment Design Document (Final)

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Prepared under

Contract Number F11624-88-D-0001/6K12
CDRL #A004-13

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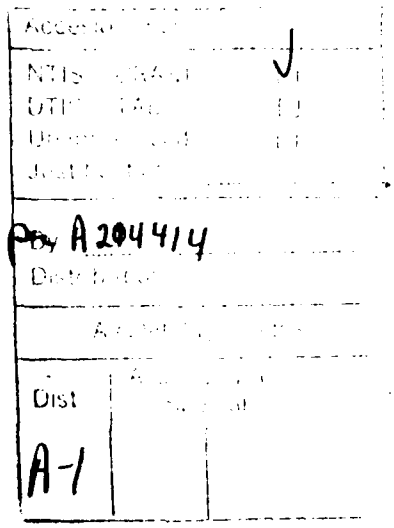
SECTION I

INTRODUCTION. The purpose of this Technical Report is to review the System/Segment Design Document (Final), CDRL A002-03, which was produced for the Government by Evaluation Research Corporation. The results are provided in the form of Data Item Discrepancy Worksheets as requested by the CMOS Program Office.

SUMMARY. Not used

CONCLUSION. Not used



SECTION II

RESULTS: Our analysis is provided in the attached Data Item Discrepancy Worksheets.

ORIGINATOR CONTROL NUMBER: SSDD-0001
PROGRAM OFFICE CONTROL NUMBER:

DATA ITEM DISCREPANCY WORKSHEET

CDRL NUMBER: A002-03 DATE: 12/14/89

ORIGINATOR NAME: John J. Brassil OFFICE SYMBOL: SAIC

TELEPHONE NUMBER: 277-9448

SUBSTANTIVE: X EDITORIAL:

PAGE NUMBER: 11 PARA NUMBER: 3.2

COMMENT OR RECOMMENDED CHANGE.

This paragraph needs clarification.

RATIONALE:

Paragraph o. should refer to "DESQview" rather than "windowing COTS software". Similarly, paragraph p. refers to mail COTS when it should refer to the specific E-mail package used on the host processor.

CMOS PMO ACCEPTS COMMENT: YES [ ] NO [ ]

ERCI ACCEPTS COMMENT: YES [ ] NO [ ]

COMMENT DISPOSITION:

COMMENT STATUS: OPEN [ ] CLOSED [ ]

ORIGINATOR CONTROL NUMBER: SSDD-0002
PROGRAM OFFICE CONTROL NUMBER:

DATA ITEM DISCREPANCY WORKSHEET

CDRL NUMBER: A002-03 DATE: 12/14/89

ORIGINATOR NAME: John J. Brassil OFFICE SYMBOL: SAIC

TELEPHONE NUMBER: 277-9448

SUBSTANTIVE: X EDITORIAL:

PAGE NUMBER: 19 PARA NUMBER: Figure 3.5

COMMENT OR RECOMMENDED CHANGE:

The items within each of the boxes should be numbered.

RATIONALE:

It it difficult to discern a correlation between items in the "Normal" and "Degraded" columns, especially when the item takes up more than one line in one column and not the other.

CMOS PMO ACCEPTS COMMENT: YES [ ] NO [ ]

ERCI ACCEPTS COMMENT: YES [ ] NO [ ]

COMMENT DISPOSITION:

COMMENT STATUS: OPEN [ ] CLOSED [ ]

ORIGINATOR CONTROL NUMBER: SSDD-0003
PROGRAM OFFICE CONTROL NUMBER:

DATA ITEM DISCREPANCY WORKSHEET

CDRL NUMBER: A302-03 DATE: 12/14/89

ORIGINATOR NAME: John J. Brassil OFFICE SYMBOL: SAIC

TELEPHONE NUMBER: 277-9448

SUBSTANTIVE: X EDITORIAL:

PAGE NUMBER: 21 PARA NUMBER: 3.5.2.2

COMMENT OR RECOMMENDED CHANGE:

This paragraph needs to be expanded to allow for direct PC connection to the host in the event of LAN failure.

RATIONALE:

If the PC workstation is close enough to the Host Processor to allow direct attachment with an RS-232 cable, use of a modem is not required or desirable.

CMOS PMO ACCEPTS COMMENT: YES [ ] NO [ ]

ERCI ACCEPTS COMMENT: YES [ ] NO [ ]

COMMENT DISPOSITION:

COMMENT STATUS: OPEN [ ] CLOSED [ ]

ORIGINATOR CONTROL NUMBER: SSDD-0004
PROGRAM OFFICE CONTROL NUMBER:

DATA ITEM DISCREPANCY WORKSHEET

CDRL NUMBER: A002-03 DATE: 12/14/89

ORIGINATOR NAME: John J. Brassil OFFICE SYMBOL: SAIC

TELEPHONE NUMBER: 277-9448

SUBSTANTIVE: X EDITORIAL:

PAGE NUMBER: 25 PARA NUMBER: 4.

COMMENT OR RECOMMENDED CHANGE:

The reference to manual configuration items should be removed.

RATIONALE:

The DID requires identification of HWCIs, CSCIs, and manual operations of the system. No mention is made of manual configuration items. As a result, the references to them in this paragraph and in paragraph 4.3 should be deleted.

CMOS PMO ACCEPTS COMMENT: YES [ ] NO [ ]

FRCI ACCEPTS COMMENT: YES [ ] NO [ ]

COMMENT DISPOSITION:

COMMENT STATUS: OPEN [ ] CLOSED [ ]

ORIGINATOR CONTROL NUMBER: SSDD-0005
PROGRAM OFFICE CONTROL NUMBER:

DATA ITEM DISCREPANCY WORKSHEET

CDRL NUMBER: A002-03 DATE: 12/14/89

ORIGINATOR NAME: John J. Brassil OFFICE SYMBOL: SAIC

TELEPHONE NUMBER: 277-9448

SUBSTANTIVE: X EDITORIAL:

PAGE NUMBER: 28 PARA NUMBER: Table 4.1.2

COMMENT OR RECOMMENDED CHANGE:

The listing of SMSCRC SLINs is in error.

RATIONALE:

The capacity for each disk drive is 155Mb, not 150Mb. This error is repeated throughout Section 4. In addition, only one SLIN is given, whereas two are required.

The SMSCRC lists SLIN 0005AB as an external 155 Mb removable non-TEMPEST hard disk. There will be only two of these at an Increment I CMOS site (one at a Satellite site). SLIN 0005EA, the internal 155Mb fixed non-TEMPEST hard disk item, should be listed in the same quantities as SLIN 0005AB for CMOS (i.e., two each for active duty sites).

CMOS PMO ACCEPTS COMMENT: YES [ ] NO [ ]

ERCI ACCEPTS COMMENT: YES [ ] NO [ ]

COMMENT DISPOSITION:

COMMENT STATUS: OPEN [ ] CLOSED [ ]

ORIGINATOR CONTROL NUMBER: SSDD-0006
PROGRAM OFFICE CONTROL NUMBER:

DATA ITEM DISCREPANCY WORKSHEET

CDRL NUMBER: A002-03 DATE: 12/14/89

ORIGINATOR NAME: Vivian L. Martin OFFICE SYMBOL: SAIC

TELEPHONE NUMBER: 272-2999

SUBSTANTIVE: X EDITORIAL:

PAGE NUMBER: 51-58 PARA NUMBER: Table 5.1a-5.3.2

COMMENT OR RECOMMENDED CHANGE:

In the series of tables and figures illustrating processing and disk resources, it appears that demand on resources equals capacity. This makes the system appear to be at its operational limit before implementation.

RATIONALE:

The elements should be divided into those whose exact requirements are known (such as NDS) and those whose requirements for Increment I are estimated. In this way, resources available for future increments can be properly estimated and illustrated. The general guidelines provided by DI-CMAN-80534 (para. 10.1.7.1) give this example of how to define processing speed, "a twenty percent reserve when in full operational configuration". Paragraph m. asks for an allocation of the processing resource for the CSCI. For CMOS, this means forecasting the processing allocations for the Applications, Communications, and System Environment CSCIs. This issue is of utmost concern, as was demonstrated by the lengthy discussion during the SDR (see SDR Minutes p. 4).

The concern described in the comment paragraph above is relevant to the incremental growth pattern expected for CMOS. Step 2 of ERCI's allocation procedure was "identifying demand on the resources in terms of the space required by NDS, applications, and supporting databases". Illustrations addressing this concern could be constructed from the preliminary projections presented at the SDR and information compiled during Step 2. Additionally, future iterations of the SRS must include this information to satisfy the DID DI-MCCR-80025A (para. 10.1.5.6) which states, "This paragraph shall specify the resources required of both memory and the central processing unit for the CSCI."

A major impact of not estimating resource allocations early in the development process could be capacity saturation as early as initial operational capability, and no resource reserves for Increment II. Our comment SSDD-0018 to the SSDD Revised Draft addresses this issue as well.

CMOS PMO ACCEPTS COMMENT: YES [ ] NO [ ]

ERCI ACCEPTS COMMENT: YES [ ] NO [ ]

COMMENT DISPOSITION:

COMMENT STATUS: OPEN [ ] CLOSED [ ]

ORIGINATOR CONTROL NUMBER: SSDD-0007
PROGRAM OFFICE CONTROL NUMBER:

DATA ITEM DISCREPANCY WORKSHEET

CDRL NUMBER: A002-03 DATE: 12/14/89

ORIGINATOR NAME: Vivian L. Martin OFFICE SYMBOL: SAIC

TELEPHONE NUMBER: 272-2999

SUBSTANTIVE: X EDITORIAL:

PAGE NUMBER: 59 PARA NUMBER: 6.2 c.

COMMENT OR RECOMMENDED CHANGE:

The effect of queuing time is omitted when calculating the equation for response time. Arbitrarily omitting variables from an equation invalidates the results.

RATIONALE:

This paragraph should state how traffic (which results in queuing time) is considered in measuring the performance of the system. Traffic simulation should be an integral part of measuring system performance via reponse time. Response time is defined as the time interval between sending a message to the CPU and receiving a meaningful response. The major components of response time are transmission time and processing time. Each of these can be further subdivided to include queuing time. At the LAN, this would be collision reconciliation time, and at the processor, queue time.

The likelihood that transmissions will collide on the LAN or have to wait for processing time can be calculated using information found in the Cargo Movement Operations System Transaction/Workload Estimate (see the CMOS RFP) and queuing theory based on the Poisson distribution. The probability that queuing time will develop at the processor is estimated at 30% and increaseas to 70% given peak transaction level estimates. The probability that queuing will develop considering both the LAN and the processor is estimated at 31% and increases to 71% given peak transaction level estimates. During peak periods, the likelihood that queuing time will not affect reponse time is only 29%. Not only does response time contain queuing time by definition, failing to consider it during testing will increase the risk that CMOS will not perform as desired and make the use of the Response Standard Transaction capability described in 6.2 c. meaningless.

Our comment SSDD-0020 to the SSDD Revised Draft, addresses this issue; it was accepted by ERCI, but no change in the documentation resulted.

CMOS PMO ACCEPTS COMMENT: YES [ ] NO [ ]

ERCI ACCEPTS COMMENT: YES [ ] NO [ ]

COMMENT DISPOSITION:

COMMENT STATUS: OPEN [ ] CLOSED [ ]

ORIGINATOR CONTROL NUMBER: SSDD-0008
PROGRAM OFFICE CONTROL NUMBER:

DATA ITEM DISCREPANCY WORKSHEET

CDRL NUMBER: A002-03 DATE: 12/14/89

ORIGINATOR NAME: John J. Brassil OFFICE SYMBOL: SAIC

TELEPHONE NUMBER: 277-9448

SUBSTANTIVE: X EDITORIAL:

PAGE NUMBER: B-1 PARA NUMBER: N/A

COMMENT OR RECOMMENDED CHANGE:

Remove the Ada Programming Support Environment entry.

RATIONALE:

The intent is not to use Ada in the CMOS development effort.

CMOS PMO ACCEPTS COMMENT: YES [ ] NO [ ]

ERCI ACCEPTS COMMENT: YES [ ] NO [ ]

COMMENT DISPOSITION:

COMMENT STATUS: OPEN [ ] CLOSED [ ]

ORIGINATOR CONTROL NUMBER: SSDD-0009
PROGRAM OFFICE CONTROL NUMBER:

DATA ITEM DISCREPANCY WORKSHEET

CDRL NUMBER: A002-03 DATE: 12/14/89

ORIGINATOR NAME: Ron Lacour OFFICE SYMBOL: SAIC

TELEPHONE NUMBER: 272-2999

SUBSTANTIVE: X EDITORIAL:

PAGE NUMBER: C-37 PARA NUMBER: 1.2.1.3.3.1

COMMENT OR RECOMMENDED CHANGE:

This paragraph is incomplete.

RATIONALE:

SSS para. 3.2.1.1.1.22 calls for query capability against FSN and/or NMFC/UFC. The reference to NMFC/UFC is omitted from this paragraph in the SSDD.

CMOS PMO ACCEPTS COMMENT: YES [ ] NO [ ]

ERCI ACCEPTS COMMENT: YES [ ] NO [ ]

COMMENT DISPOSITION:

COMMENT STATUS: OPEN [ ] CLOSED [ ]

ORIGINATOR CONTROL NUMBER: SSDD-0010
PROGRAM OFFICE CONTROL NUMBER:

DATA ITEM DISCREPANCY WORKSHEET

CDRL NUMBER: A002-03 DATE: 12/14/89

ORIGINATOR NAME: Ron Lacour OFFICE SYMBOL: SAIC

TELEPHONE NUMBER: 272-2999

SUBSTANTIVE: X EDITORIAL:

PAGE NUMBER: D-154 PARA NUMBER: SS0024

COMMENT OR RECOMMENDED CHANGE:

This shall statement is incomplete.

RATIONALE:

Reference to the SMSCRC was deleted leaving a four word phrase that is neither a shall statement nor a complete sentence.

CMOS PMO ACCEPTS COMMENT: YES [ ] NO [ ]

ERCI ACCEPTS COMMENT: YES [ ] NO [ ]

COMMENT DISPOSITION:

COMMENT STATUS: OPEN [ ] CLOSED [ ]

ORIGINATOR CONTROL NUMBER: SSDD-0011
PROGRAM OFFICE CONTROL NUMBER:

DATA ITEM DISCREPANCY WORKSHEET

CDRL NUMBER: A002-03 DATE: 12/14/89

ORIGINATOR NAME: Vivian L. Martin OFFICE SYMBOL: SAIC

TELEPHONE NUMBER: 272-2999

SUBSTANTIVE: X EDITORIAL:

PAGE NUMBER: E-5 PARA NUMBER: Figures E.5 through E.16

COMMENT OR RECOMMENDED CHANGE:

The data flow diagrams for CMOS applications beginning on page E-5 are not balanced.

RATIONALE:

Data flow diagramming is a system development tool for identifying data flows, processes, and the relationships between them. The depiction of relationships is achieved through balancing the higher level diagrams with their respective exploded views. The result of balancing is a set of diagrams where particular data stores and terminators are represented only once in the whole series. The advantages of balancing include: simple diagrams, no duplication of information, and a single point of reference for each data store and terminator. These diagrams are valuable independently as illustrations, but not as a set of DFDs. It appears that data flow diagramming was not the tool used to identify these data stores, processes, and relationships. The Revised Preliminary Applications SRS, Figure 3.2, suggests that a different method was used which might produce the comprehensive picture of CMOS that these DFDs were intended to depict.

The natural inference that these flawed DFDs will be used in system design gives rise to fears that the design will be flawed as well. These DFDs do not do justice to the level of effort evident in the rest of this document and the SRS. Our comment SSDD-0046 to the Revised Draft SSDD addressed this issue. The corrections made did not include balancing the diagrams.

CMOS PMO ACCEPTS COMMENT: YES [ ] NO [ ]

ERCI ACCEPTS COMMENT: YES [ ] NO [ ]

COMMENT DISPOSITION:

COMMENT STATUS: OPEN [ ] CLOSED [ ]