



EM DIVISION

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FOR THE AIRBORNE REAL TIME
INSTRUMENTATION SYSTEM

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REVISION PAGE

REVISION	DESCRIPTION
1	<ul style="list-style-type: none"> Changes in Software Development Library, Flow of configuration control, and in corrective action process Add the project tracking
2	<ul style="list-style-type: none"> Redefine system overview
3	
4	
5	
6	

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1 SCOPE

1.1 Identification

This Software Development Plan (SDP) is applied to a system described as follows :

System identification number : ARTIS_t_System_001
System title : Airborne Real Time Instrumentation System
System abbreviation : ARTIS_t

This SDP is concerning about the software package consisting of only one Computer Software Configuration Item (CSCI) as follow:

CSCI number : ARTIS_t_CSCI_001
CSCI title : Airborne Real Time Instrumentation System
CSCI abbreviation : ARTIS_t

1.2 System Overview

Purpose of system :

ARTIS_t system is an instrumentation system based on Personal Computer (PC) which is installed on board the prototype aircraft to perform presentation of flight test data in real time. The presentation consists of display the data in table mode, display the data in graphic mode, display the data in mixed mode (table and graphic), and display the data in xplot mode (graphic between 2 parameters), and also print and record the data. The data which has been recorded by ARTIS_t, can be used by other software through the Disk Management System (DMS). The PC equipped with an interface for Pulse Code Modulation (PCM) decoder called ARTIS_t Card.

The following figure describes the system architecture of the ARTIS_t :

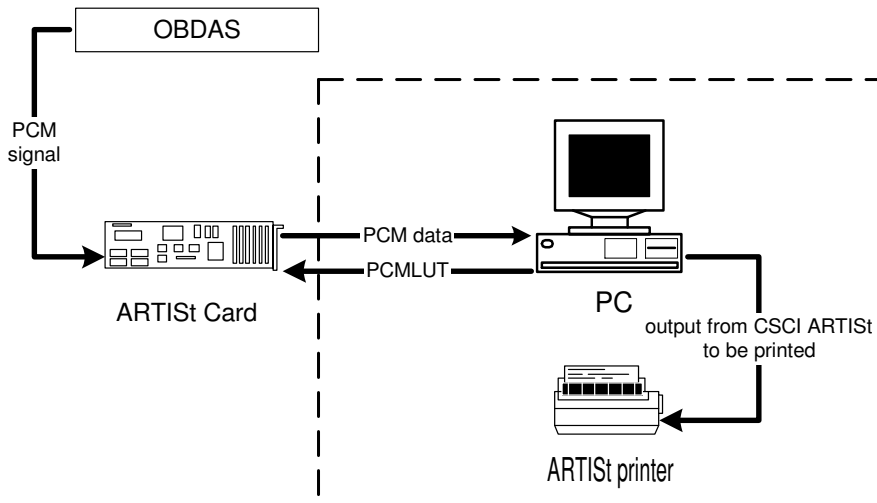


Figure 1 : "The ARTIS_t System Architecture"



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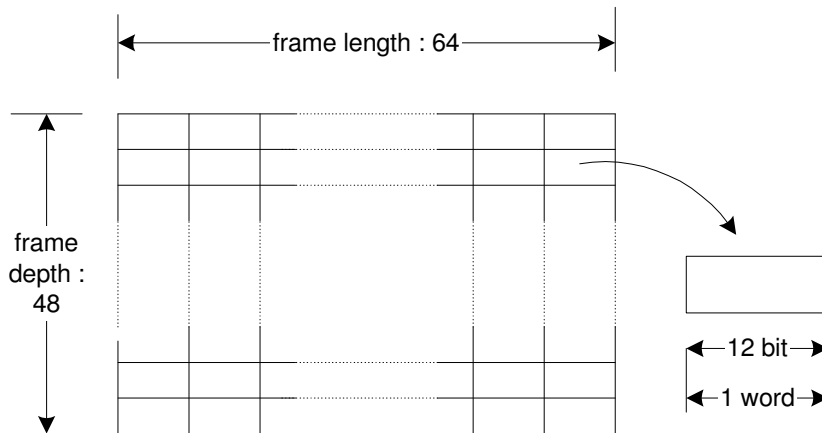
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On Board Data Acquisition System (OBDAS) is an instrumentation system which is installed on the prototype aircraft directly acquires analog and digital signals from various flight test sensors and other measurement sub system and convert them into a format suitable for real time display, telemetry and recording.

ARTIS_t card is an instrumentation system which is installed inside the PC which must receive a serial PCM bit stream output incoming from OBDAS, decoding it, and then transferring the data to the PC memory based on Pulse Code Modulation Look Up Table (PCMLUT). One PCM data is 12 bits (1 word) long. There are parameters which have 1 word data and Aeronautical Radio Incorporated (ARINC) parameters which has 3 words data. PCMLUT is array of PCM word position, means parameter position inside PCM data stream, which is arranged according to calibration file. PCM frame size is equal the size of PCM bit stream decoded by OBDAS which has specific frame length and frame depth, and position of frame number.

The following figure describes PCM data generated out from OBDAS and received by ARTIS_t.



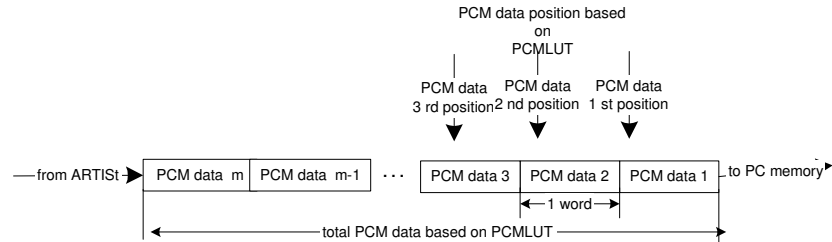
Note :
frame size : frame depth x frame length

Figure 2 : "PCM Data Output from OBDAS to ARTIS_t "

After passing through ARTIS_t card, the PCM data which goes out depending on PCMLUT. To regulate PCM data in PC memory, it is performed by the Non-Developmental Software (NDS) files. The NDS files are Artbuf and ISRPCM files.



The following figure represents PCM data which goes to PC memory.



Note :

m : total pcm_data which goes out to PC memory based on PCMLUT.
(It can be said that **m** is sum pcm_data position)

Figure 3 : "PCM Data from ARTIST Card to The PC Memory"

Purpose of the CSCI :

ARTIST CSCI is a configuration item that is installed inside the PC and access the PCM data in the PC memory.

ARTIST CSCI should perform the following functions :

1. collect electrical data from ARTIST card
2. process the data : process to translate electrical data into engineering data and extended parameters calculation
3. present the data :
 - a. on-line displaying with status (displayed electrical data or engineering data in table mode or graphic mode or mixed mode or xplot mode),
 - b. on-line recording (electrical data and/or engineering data)
 - c. on-line printing (electrical data or engineering data)

ARTIST CSCI is able to process the all safety parameters used in prototype aircraft of IPTN. These parameters are defined by the Flight Test Engineer (FTE).

Electrical data is occurred because of a measurement device produce specific electrical voltage. PCM data is electrical data format. Then it is allocated in memory within hexadecimal value. Engineering data is readable data from engineering view. Actually, this engineering data will be got from calculation electrical data with specific formula based on calibration data (this data occurs from laboratory test).

Data collection is to select and to take electrical data which needed via ARTIST card. Data processing means that PCM data from ARTIST card will be translated from electrical data into engineering data and extended parameters calculation, based on calibration data which saved on calibration file with specific formula. Data presentation means, either electrical data or engineering data can be displayed on screen monitor (table mode and/or graphic mode), printed on printer and saved electrical data to the harddisk of PC.



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1.3 Document Overview

This SDP has been prepared in accordance with the requirements defined in DOD-STD-2167A, Thomson-CSF Software Development Methodology, and IPTN Software Standard, to provide direction and monitoring during the engineering and management development phase(s) of the CSCI for this project. The purpose of this document are the following:

- to describe operation rules for the organization to perform software development
- to define technical activities which will be performed in software development cycles, defines techniques, methods applied, procedures, tools, development environment, development schedule, and management activities.

1.4 Relationship to other plans

This SDP will be used in conjunction with the Software Test Report (STRp) for the ARTIST, and other special program plans for the management of the software development for this project.



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2 REFERENCED DOCUMENTS

2.1 International documents

- [1] DOD-STD-2167A Military standard,
Defense System Software Development,
(issue date 29 February 1988).
- [2] MIL-STD-1521B Military standard,
Technical Reviews and Audits for Systems, Equipment and Computer
Software.
(issue date 4 June 1985).

2.2 THOMSON-CSF documents

- [3] RDL-101 Thomson-CSF standard,
Overview of Thomson-CSF Software Development Baseline
(issue date September 1993).
- [4] RDL-318 Thomson-CSF standard,
Drafting Guide for Software Development Plan (SDP),
(issue date September 1993).

2.3 IPTN documents

- [5] PART 41 G – NCS 2001 IPTN Computational / Software Standard,
Airborne Software Standard,
(issue date 08 July 1998).
- [6] EM/000/PRO/AL/005 EM Division Procedures for Document and Data Control,
(Rev. 1, issue date November 1997).
- [7] EM/000/PRO/AL/006 EM Division Procedures for Configuration Management Control,
(Rev. New, issue date April 1997).
- [8] EM/000/PRO/AL/026 EM Division Procedures for Software Design Control,
(Rev. 1, issue date November 1997).
- [9] EM/000/PRO/AL/030 EM Division Procedure for Program/Project Management,
(Rev. 1, issue date September 1997).
- [10] TN/N250/DAS/12/97/004 Functional Test On Board Data Acquisition System,
(issue date December 20, 1997)



3 SOFTWARE DEVELOPMENT MANAGEMENT

3.1 Project Organization and resources

This section describes the project organization and the project resources needed in the software development of the ARTIS_t.

3.1.1 Contractor Facilities

Software development and software testing of the ARTIS_t are done in FTC-IPTN and Department of Informatic ITB site.

The facility is one PC Computer. This computer will provide the software development package and offices management tools to support the requirements analysis, software design, software coding, software testing, software integration, engineering configuration management, and software documentation activities.

The hardware and software resources required for the software development of the ARTIS_t is further described in paragraph 4.1.3.

3.1.2 Government Furnished Equipment, Software and Services

Not Applicable

3.1.3 Organizational structure

The organizational structure for the ARTIS_t project is described in figure 4 below:

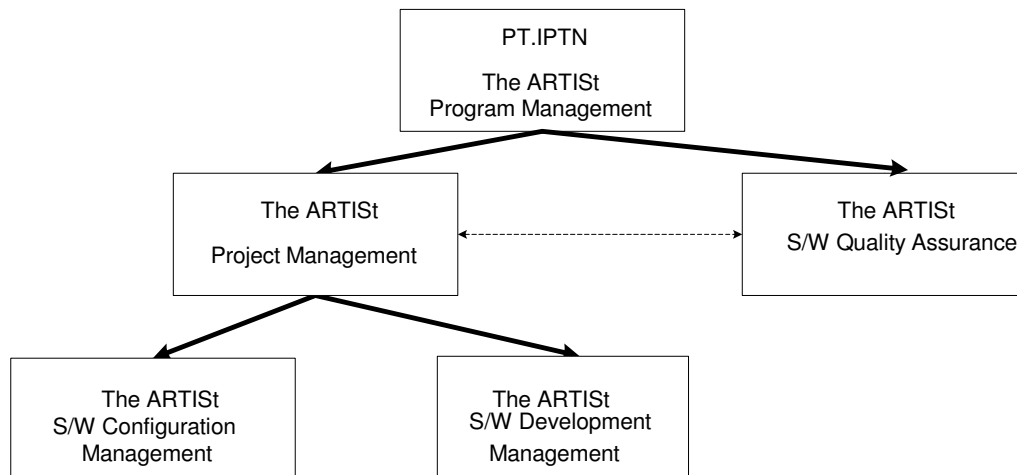


Figure 4 : The ARTIS_t Project Organizational Structure



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The program management is responsible for the agreement of the Program Management Strategy with the contracting agency. The contracting agency is IPTN representative.

The ARTISt Project Management is responsible for providing the good management and control of the project to produce orderly development and acceptance of software.

The ARTISt Configuration Management is responsible for ensuring that development and production of software, and software data are identified, configured and controlled based on the software life cycle.

The ARTISt Software Development Management has responsibility for performing software requirement analysis, software preliminary design, software detail design, software coding and testing, software integration and verification, and system integration according to the software life cycle.

The ARTISt Project Quality Assurance is responsible to provide assurance of the quality, conformance and completion of project process and results as defined in the plans and procedures.

3.1.4 Personnel

The name and the responsibilities of the personnel needed in the software development project is described on the following table:

Function	Name	Department
ARTISt Program Management		
ARTISt Program Manager	Lukman Hakim S.	SBU TES
ARTISt Project Management		
- ARTISt Project Manager	Imam M. Shofi	DLP-FTC
ARTISt Project Quality Assurance		
- ARTISt Project Quality Engineer	Husein Abud	DLP-FTC
ARTISt S/W Development Management		
- ARTISt S/W Development Manager	Nugrajanto HS	TIS-FTC
- ARTISt S/W Development Engineer	Imam M. Shofi	DLP-FTC
- ARTISt S/W Test Engineer	Imam M. Shofi	DLP-FTC
ARTISt S/W Configuration Management		
- ARTISt S/W Configuration Engineer	Nugrajanto HS	TIS-FTC

Table 1: Identification of The ARTISt Project Team



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3.2 Schedule and milestones

3.2.1 Activities

The software development activities of the project and its associated schedule are described in Appendix A. The progress of the project execution will be tracked using indicators and its category as follow:

No.	Type of indicator	Category						
		Progression Stage	Cost	Effort	Quality	Stability	Sizing	Risks
1	Milestone tracking	✓						
2	Requirement tracking					✓		
3	Number of CSUs designed, coded, and tested tracking	✓				✓		

The updating of the indicators will be implemented weekly. Further description regarding the indicators form can be seen in Appendix F and the tracking activities can be seen in Appendix G.

3.2.2 Activity network

Activity network has included to schedules and milestone of ARTISt.

3.2.3 Source identification

The required resources for the software development have been provided in the FTC-IPTN and department of Informatic ITB.

3.3 Risk Management

The potential risk management identified is as follows:

No.	Risk	Risk Processing Type Action
1	Availability of hardware resources	report to the FTC-IPTN or Informatic ITB
2	Availability of software resources	report to the FTC-IPTN or Informatic ITB

3.4 Security

Only limited person (data analyst and specialist) can access the recorded data.

3.5 Interface with associated contractors

Not applicable.



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3.6 Interface with software IV & V agents

Not Applicable.

3.7 Subcontractor management

Not Applicable.

3.8 Formal reviews

The reviews will be performed during the software development cycle. The review has been scheduled in project schedule for the milestones as shown in Appendix A. The convergence agenda is sent out to solicit the participation of the review/audit members. It contains the purpose of review/audit, the list of documents submitted for examination, the list of the review/audit committee members and the reading sheet as shown in Appendix D. The material under review must be made available to reviewers at least one week before the meeting. The reviews are as follows:

1. Software Specification Review (SSR)

This review applies to a CSCI. This review will be performed in order to evaluate the completeness and adequacy of the software requirement document will be assessed against system requirement. The documents examined are SRS and IRS.

2. Preliminary Design Review (PDR)

This review applies to a CSCI. This review is held to evaluate the technical adequacy of the preliminary design before the beginning of detailed design. The review assesses the progress, consistency, and technical adequacy of the selected design approach also checking the design compatibility with the functional and performance requirements of the SRS.

3. Critical Design Review (CDR)

This review applies to a CSCI. This review is held to determine acceptability of the detailed software design as depicted in SDD in satisfying the requirements of the SRS, in reviewing compatibility with the other software and hardware with which the product is required to interact and in assessing the technical, cost and schedule risk of the product design. CDR is an evaluation of the completed SDD before start of coding.

4. Test Readiness Review (TRR)

This review applies to a CSCI. It aims at verifying that the test procedures are complete and ready to begin testing as defined in approved verification plan. It also review verification status and coding status. Then, formal qualification tests of the CSCI can be launched. The documents examined are SDD and STP.

3.9 Software development library

Software product and its associated documents are stored in the Software Development Library (SDL). See Appendix E for detail hierarchy. During the ARTIS development there are four type of space: Archiving Space, Reference Space, Working Space, and Integration Space.

The Archiving Space is a space where all of the archiving files take place. Reference Space contained reference version of the software configuration. Working Space is a space where the actual development is taking place. This Space contained part of software tree structure subject for modification or evolution. Coding and unitary testing are taking place also in this space. Integration Space is a space where the new version of a software tree structure is built, before being archived.



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3.10 Corrective action process

The problems encountered during software development process will be established with a corrective action process initialized by issuing a PCR form.

This PCR will be evaluated by Software Configuration Control Board (SCCB) who decides whether a change should be taken or not. If proposed changes are refused, the PCR will be closed, otherwise the SCCB decides whether a change is complex or not. If the change is complex, engineering change proposal (ECP) shall be raised, otherwise the change can be implemented. If the changes do not impact to the specification then the change can be directly implemented, otherwise the software change notice (SCN) will be issued before implementation. The next step is to verify the change (reevaluate the whole documents). It may be found another problem related to changes before, then another PCR should be generated. For the changes which no new one detect, the problem are closed.

This process is described in Appendix B: "Flow of Configuration Control".

3.11 Problem/change report (PCR)

The problem/change report is used to describe each problem detected in software or documentation that has been placed under configuration control. This report shall serve as input to corrective action process, and format of the PCR, SCN, and ECP are described in Appendix C: "Problem and Change Control Format"



4 SOFTWARE ENGINEERING

4.1 Organization and resources - software engineering

4.1.1 Organizational structure - software engineering

The organizational structure for software engineering is described in figure 5 below:

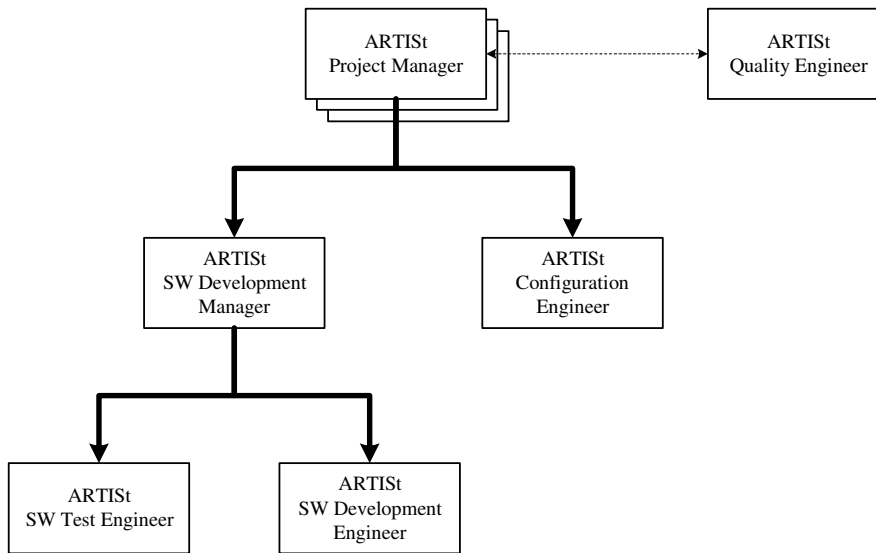


Figure 5: Software Engineering Organizational Structure

The ARTISt Software Development Manager organizes the ARTISt Software Development Team, and has responsibility for software development and/or maintenance. The responsibilities include:

- Planning of all software development and software test tasks associated with the total software development effort,
- Managing of the software requirements analysis, design code, Software unit test, integration and CSCI testing,
- Managing software technical document of all software development and software test tasks associated with the software development effort,
- Providing technical consultation and review as necessary.

The ARTISt Configuration Engineer organizes the ARTISt Configuration Management, and has the following responsibilities:

- making preparation of Indexes and Change Status reports,
- managing the configuration library, and database(s).

The ARTISt Project Quality Assurance Engineer is responsible for all project quality assurance activities such as audit of the activities, inspections and associated documentation to ensure available evidence conformed to the customer requirements.



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The ARTISt Software Test Engineer is the individual who manages, controls, administers, and regulates the ARTISt project test system. The software test engineer is ultimately responsible to the software development manager for all aspects of the software testing for the project. The responsibilities include:

- Making regulation of the development of formal test plans, formal test case design, formal testing of the software,
- Organizing the test equipment, simulation development and software test environment.

The ARTISt Software Development Engineer has the following responsibilities:

- performing software requirements analysis, design, implementation, and integration,
- making software development documentation.

4.1.2 Personnel - software engineering

The software development management consists of two persons as described in table 1. Strong educational background of computer science, good knowledge of measurement and data acquisition system, familiar with C programming language. Those persons have capabilities in software analysis using SA/RT methodology and in design using Object Oriented Design (OOD) methodology.

4.1.3 Software engineering environment

4.1.3.1 Software items

The following software items required for the development software are:

1. The operating system of the development and integration environment :
MS-Dos Version 4.00 or later.
2. The compiler and linker :
Borland C version 3.0 or later.
The C Programming Language will be used to develop the software code.
3. The operating system of documentation activities :
Microsoft Windows Version 95 or later.
This windows will be needed since MS office, MS Project, and Visio running under windows environment.
4. Text editor :
Microsoft Office 97.
The MS Office will be used to produced technical documentation, including source codes when necessary.
5. Drawing tools :
Visio version 4.0 or later
The Visio will be used to draw the organization structure, DCD, CCD, DFD, CFD and other diagram.
6. Scheduler :
Microsoft Project Version 4.0 or later.
The Microsoft Project will be used to create the development schedule and manage the development activities.



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4.1.3.2 Hardware and firmware items

The following hardware are required for the development of the ARTIST:

1. ARTIST Card
2. ARTIST cable
3. PC minimum AT 486 DX4-120
4. Dot matrix printer Epson LQ series for software testing
5. Laser jet printer HP series for software documentation.

4.1.3.3 Proprietary nature and Government rights

Not Applicable.

4.1.3.4 Installation, control and maintenance

Not Applicable

4.2 Software Standards and procedures

4.2.1 Software Development Techniques and Methodology

The techniques and methodologies which will be applied to each of the development phase :

1. Software Requirement Analysis : SA/RT
2. Design (preliminary and detail) : Technique for Object Oriented Design (TOOD)
3. Coding : ANSI C programming guide
4. CSU testing : Driver for each CSU.
5. CSC integration and testing : Driver for each CSC within tested CSUs.
6. CSCI testing : Qualification / Validation Testing.

4.2.2 Software development files

Software Development Files (SDF) contained test cases and test report files during the unitary, CSC test and CSCI test. SDF will be stored with associated CSUs, CSCs, and CSCI.

4.2.3 Design standards

The design methods which will be used in developing software is Technique Object Oriented Design (TOOD).

4.2.4 Coding Standards

The coding will be done in C programming using ANSI C standard Programming .

4.3 Non-Developmental Software

The NDS that will be used for ARTIST are ISRPCM.com and ArtBuf.com files. These files are provided by FTC-IPTN.



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5 FORMAL QUALIFICATION TESTING

5.1 Organization and resources - Formal qualification testing

5.1.1 Organizational structure - Formal qualification testing

See paragraph 3.1.1.

5.1.2 Personnel - Formal qualification testing

Personnel who will carry out the formal qualification testing should be familiar with software life cycle process, data acquisition system, and software testing.

5.2 Test approach / philosophy

The philosophy will satisfy functional test and it must allow the contracting agency to determine whether a configuration item meets the requirements assigned to that item.

The Formal Qualification Testing (FQT) shall be conducted to the ARTIS_t on the target computer system in a simulated environment. The approach used to test of the ARTIS_t software is the “black box” method.

5.3 Test planning assumptions and constraints

Test planning will be done in various kinds of activities. It must satisfy : functional test, performance test, stress test, and structural test. Test planning activities will include software endurance tests to the limits of the requirements specified for the software. The test personnel will use the system documentation to prepare all test design , case and procedure specifications. This approach will verify the accuracy and comprehensiveness of the information in the documentation in those areas covered by the tests.

Each module will be tested first with valid and invalid input. All the combinations will then be used. A program will be written to drive the module. Before testing begins, a test case file will be generated in the same format as the driver file. The records will contain the input values along with the predicted resulting values. Following a test run , the driver file will be compared with the case file. If any differences happen, a reporting file will issued.

Functional test cases specify typical operating conditions, typical input values, and typical expected results.

Performance test should be designed to verify response time (under various loads), execution time, and traffic rates on data channels and communication links.

Stress test is design to overload system in various way, such as attempting to sign on more than maximum allowed number of terminals or disconnecting a communication link.

Structural test is concerned with examining the internal processing logic of software system.



6 SOFTWARE PRODUCT EVALUATIONS

6.1 Organization and resources - Software product evaluations

6.1.1 Organizational structure - Software product evaluations

See chapter 3.1.3.

Software product evaluation (SPE) will be performed by project quality assurance focused on the software design process, design consistency, and trace ability requirement.

6.1.2 Personnel - software product evaluations

The personnel who will perform the software product evaluation should have good knowledge of software life cycle process, SA/RT methodology, Object Oriented Design methodology, SCM process, and SQA process. Ability to conduct of each review phase is required.

6.2 Software product evaluation procedures and tools

6.2.1 Procedures

The procedures will be used to evaluate the software products are as follow:

- product review
- cross-reading
- code re-reading

6.2.2 Tools

Not Applicable

6.3 Subcontracted products

Not Applicable

6.4 Software product evaluation records

The result of SPE will be recorded in review report and problem report. The SPE records are part of Software Development Library (SDL) that consist of summary of reviews, found problems and corrective actions to solve the problems. The SPE records will be determined as long as this project under configuration control.

6.5 Activity - dependent product evaluations

The software product evaluation shall be performed using the evaluation criteria as specified in Appendix D of DOD-STD -2167A[1].



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The Products Evaluation Activities are described as table below:

ARTISt products to be evaluated	Evaluation Criteria							Note: Clarification or additional criteria
	Internal consistency	Understandability	Trace ability to indicated document	Consistency with the indicated document	Appropriate analysis, design, or coding	Appropriate allocation of sizing and timing resources	Requirement coverage by appropriate test	
SDP	√	√						
IRS	√	√			√	√		Consistency with SDP. Requirement testability.
SRS	√	√		IRS	√	√	√	Consistency with IRS & other specification. Requirement testability. Quality factor adequacy.
SDD	√	√	IRS SRS		√	√		Consistency between data specification and data definition used. Accuracy and required precision of constants.
STRp	√	√	IRS SRS	SDP				Adequacy of test set, test result, data recording, data analysis methods.
Source Code	√	√	SDD		√	√		Compliance with design and coding standards, maintainability requirements, and CSU requirements.

Table 2 : The Product Evaluations Activities



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7 SOFTWARE CONFIGURATION MANAGEMENT

7.1 Organization and resources - configuration management

7.1.1 Organizational Structure - configuration management

See chapter 3.1.3

The software configuration management will be performed by the ARTIS^t Configuration Management focused on software configuration identification, control, and status accounting. The ARTIS^t Configuration Management consist of software configuration engineer.

7.1.2 Personnel - configuration management

The personnel who is responsible to the configuration management is to be familiar with software life cycle process and SCM process.

7.2 Configuration identification

The configuration identification will be developed in three levels, based on three baselines:

- Functional baseline
The functional baseline will be established together with approved changes or operational system development.
- Allocated baseline
The Allocated baseline will be established upon completion of Software Specification Review (SSR), and will be documented by Interface Requirement Specification (IRS) and Software Requirement Specification (SRS) documents.
- Product baseline
The product baseline will be established on the completion of the PCA and FCA. The Audit Configuration defines software product specification.

7.2.1 Developmental configuration identification

For ARTIS^t CSCI, the software design documentation will be reviewed and entered into developmental configuration. The documents including in the developmental configuration are Software Design Document for the ARTIS^t (EM/000/SDD/DD/004) and source code listings. Number, version, and title or file name will identify precisely the CSCI, CSC, and CSU in the ARTIS^t system.

7.2.2 Identification methods

- Identification of CSCI.
Name of the CSCI is ARTIS^t.
- Identification of document.
The documentations related to the Allocated and Product Baselines and the developmental configuration will be identified according to EM/000/PRO/AL/005, EM Division Procedures for Document and Data Control.



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- Identification of CSC and CSU.
Identification of CSC's and CSU's will be given according to CSCI decomposition. Every CSC and CSU file will have file header describes the CSC/CSU identification and another information required.

7.3 Configuration control

7.3.1 Flow of configuration control

See Appendix B: " Flow of Configuration Control".

7.3.2 Reporting documentation

The Problem/Change Report (PCR) can be used as reference documents as follow to report the problem(s) found in software and item which are needed to be fixed.

The form will be implemented when changes are occurred according to the changed requirements. The software problems and design changes occurred during the development must be recorded in "../Tech_doc/change" directory. The procedure to initiate PCR is described in chapter 3.10

7.3.3 Review procedures

The review procedures is associated with the flow of configuration control. The purpose of this review is to decide whether or not a proposed change should take a place. The review procedure is that the board should receive the proposed PCR according to ARTIST problems, modifications, enhancements, or changes to be reviewed.

7.3.4 Storage, handling, and delivery of project media

The software items will be kept indefinitely on magnetic disk and/or compact disk and will be packed and labeled by a label described the software name, serial number, and VDD number.

Technical documentation, including executable files, will be delivered to contracting agency, on paper and electronic form according to design tool as specified in chapter 4.1.3.1.

During development, there is always backup of the data on development computer and magnetic disks.

7.3.5 Additional Control

Not Applicable



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7.4 Configuration status accounting

The Version Description Document (VDD) shall contain of recorded configuration of software product. According to software changes, it must be updated the documents periodically. The currently applicable VDD will also be released for each software delivery.

The configuration status accounting will be recorded in the configuration status report. This report contains the list of software documentation with the document status, and the list of the approved changes. This report will periodically be updated to incorporate software changes. The Configuration Manager is responsible for updating the software configuration.

7.5 Configuration audits

Functional Configuration Audits (FCA) and Physical Configuration Audits (PCA) will be performed in accordance with general and detailed requirements, and specifics process that is, procedures, tasks, and responsibilities. The main purpose of the FCA and PCA is to establish a product baseline for the CSCI.

The FCA will be an examination of the configuration identification documents for the CSCI to ensure that the technical documentation accurately reflects the actual functional characteristics of the configuration item and conforms to the necessary interface characteristics. Test and evaluation data will be examined to verify the configuration item has achieved the performance specified in the relevant configuration identification documentation, i.e., functional and allocated baselines.

The PCA will be an audit of the configuration identification documentation, and the design documentation to ensure that the configuration baseline engineering documents have been adhered to and that the as-coded condition is in accordance with them.

The PCA includes a detailed audit of:

- the Software Design Document,
- the Version Description Document,
- the source code listings.

The FCA and PCA will be performed by Project Quality Assurance with support from the ARTIS Development Team, and the ARTIS Configuration Management Team.

7.6 Preparation for specification authentication

The contracting agency may submit document that contains system requirement to developer for review and authentication. The developer response contracting agency's requests by submit software development plan to contracting agency for approval. After the contracting agency and the developer approve the requirement document, the document will be implemented

7.7 Configuration management major milestones

See Appendix A : " Schedule and Milestones of the Project".



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8 OTHER SOFTWARE DEVELOPMENT FUNCTIONS

Not Applicable



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9 NOTES

Used acronyms and abbreviations:

- ARTIS_t : Airborne Real Time Instrumentation System
- CA : Convergence Agenda
- CDR : Critical Design Review
- CCD : Control Context Diagram (SA-RT model element)
- CFD : Control Flow Diagram (SA-RT model element)
- CSC : Computer Software Component
- CSC_I : Computer Software Configuration Item
- CSU : Computer Software Unit
- DOD : Department of Defense
- DPL : Data Processing and LAN
- ECP : Engineering Change Proposal
- EM : Electronic Center and Measurements System
- FCA : Functional Configuration Audit
- FQT : Formal Qualification Testing
- FTC : Flight Test Center
- IPTN : Industri Pesawat Terbang Nusantara
- IRS : Interface Requirement Specification
- ITB : Institut Teknologi Bandung
- IV & V : Independent Verification and Validation
- MJR : Major
- MNR : Minor
- NDS : Non Developmental Software
- OBDAS : On Board Data Acquisition System
- PC : Personal Computer
- PCA : Physical Configuration Audit
- PCM : Pulse Code Modulation
- PCR : Problem/Change Report
- PDR : Preliminary Design Review
- RS : Reading Sheet
- RTSE : Real Time Software Engineering
- SA-RT : Structured Analysis for Real Time
- SCM : Software Configuration Management
- SCN : Software Change Notice
- SDD : Software Design Document
- SDF : Software Development File
- SDL : Software Development Library
- SDP : Software Development Plan
- SPE : Software Product Evaluation
- SQA : Software Quality Assurance
- SRS : Software Requirement Specification
- SSE : Sensory and Special Equipment
- SSR : Software Specification Review
- STP : Software Test Plan
- TOOD : Technique for Object Oriented Design
- TRR : Test Readiness Review
- VDD : Version Description Document



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APPENDIX A : “Schedule and Milestones of the Project”



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Empty content area for the Software Development Plan.



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Empty content area for the Software Development Plan.



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APPENDIX C : "Problem/Change Form"




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1. Problem/Change Report

	<p>Problem/Change Report for Airborne Instrumentation System Number : EM/000/PCR/XXX [1]</p>
Originator: [2]	Issue Date: [3] CSCI Name: ARTISt [4]
Title of modification: [5]	
Approval: [YIN] [6]	Reference: [7]
Approved by: [8]	Approval Date: [9]
Description [10]	

Note:

- [1] PCR ID, XXX indicates ID number
- [2] Person/Institution who submit PCR
- [3] Date of PCR is issued
- [4] Name of CSCI
- [5] Short title describes the PCR content
- [6] Approval of PCR (Accept = Y, Reject = N)
- [7] Reference concerning the approval of PCR
- [8] SCCB who decide the approval of PCR
- [9] The date of PCR approval
- [10] Description of PCR



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2. Specification Change Notice

SPECIFICATION CHANGE NOTICE		
<u>SOURCE</u>		<u>Date:</u> (2)
Company :	(1)	Originator :
<u>PRODUCT IDENTIFICATION</u>		
CSCI :	(3)	System :
<u>TITLE OF THE MODIFICATION</u>		<u>Id:</u> (5)
(4)		
<u>CLOSING</u>		Date : (7)
Reason for close:	(6)	Closed by : (7)
		Approved by:
Affected Document	Page	Description of Modification
(8)	(9)	(10)
		Page 1 of X: (11)

Note:

- (1) Name of personnel(s) who originating the SCN
- (2) Date when the SCN is initiated in format dd/mm/yy
- (3) Identification of CSCI and system to where this SCN is applicable
- (4) Title of modification made by the SCN
- (5) Identification number of SCN :
- SCN_ARTISt_XX : SCN for ARTISt System
- (6) Reason for closing of the SCN
- (7) Name of personnel who close the SCN, when the SCN is closed..
The SCN will be closed after it has been approved by Program Manager
- (8) The title, number, date, and revision of the document affected by SCN
- (9) Page number of the affected document
- (10) Description of modification made to the affected document
- (11) Page number of the SCN in format of current page number/total page number



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APPENDIX D : “Reviews and audits forms”



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1. CONVERENCE AGENDA



**CONVERENCE AGENDA
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**Document No.
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Revision: Draft

**CONVERENCE AGENDA FOR THE REVIEW (AUDIT) <name of review>
SCHEDULED IN THE SDP <section/paragraph>
CONCERNING <CSCI identification>**

You are invited to participate in the <name of review/audit> review(audit) which is to be held on (date(s), time, and place).

The list of the review/audit committee members are :
<review/audit members name>

The purpose of this review/audit is as follows.
<Insert a text (3 to 5 lines) indicating the purpose of the review/audit>

The list of documents submitted for examination is indicated below.
<name and identification of the document>

Please take all necessary steps to enable you or your representative to attend the review/audit on the date specified and carry out a critical reading of the document submitted. For this purpose, you are invited to fill your remarks before <date> using the attached READING SHEET model.

Attachments : <list of attachments>



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2. READING SHEET



**READING SHEET
for
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Document No.
EM/000/RV/DD/xxx

Revision: Draft

Document Name : Index :	Name of Review : Date :	CSCI name : Ident. Number :	EVALUATION CRITERIA TO BE TAKEN INTO ACCOUNT	
From : Code :	Review manager: Code :	Number of page :	Internal consistency Consistency between documents. Adequacy of techniques Coverage of tests Testability of requirements	Understandability Traceability Adequacy of resources Quality factor

No.	REMAKS	Para	Page	Maj	Min	SOLUTIONS

Note : Para : Paragraph number, Page : Page number, Maj : Major remark, Min : Minor remark



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3. LIST OF MINOR REMAKS



**LIST OF MINOR REMARKS
for
Airborne Real Time Instrumentation System**

**Document No.
EM/000/RV/DD/xxx**

Revision: Draft

Document Name :
.....
Index :

Name of Review :
.....
Date :.....

CSCI name :
.....
Ident. Number :
.....

ORIGIN		SUMMARIZED REMAKS	TAKEN INTO ACCOUNT	
member code	No.		Y	N



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4. LIST OF MAJOR REMAKS



**LIST OF MAJOR REMARKS
for
Airborne Real Time Instrumentation System**

**Document No.
EM/000/RV/DD/xxx**

Revision: Draft

Document Name :
.....

Index :

Name of Review :
.....

Date :.....

CSCI name :
.....

Ident. Number :
.....

ORIGIN		SUMMARIZED REMAKS	TAKEN INTO ACCOUNT	
member code	No.		Y	N



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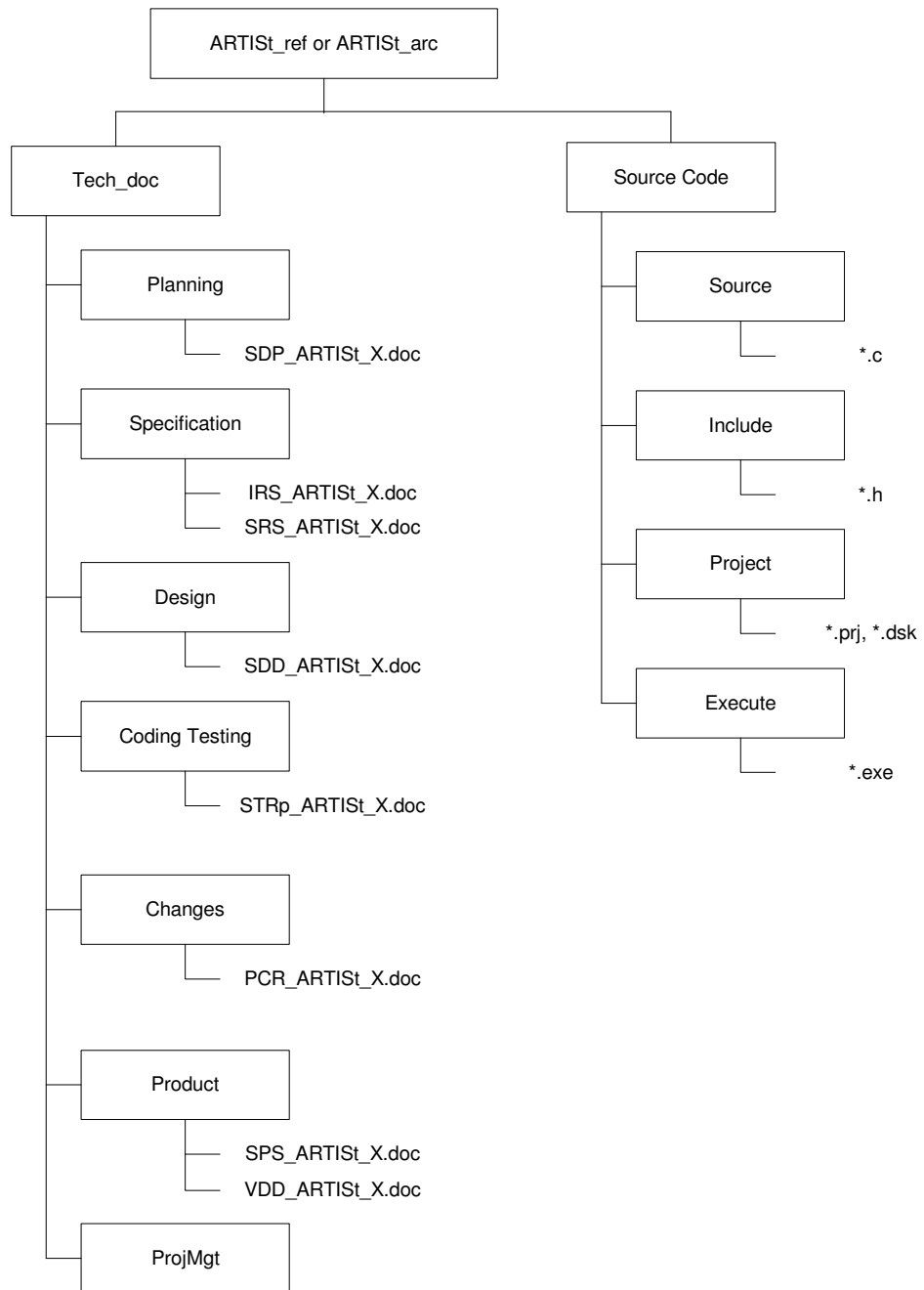
**Document No.
EM/000/SDP/DD/001**

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APPENDIX E : “Software Development Library”

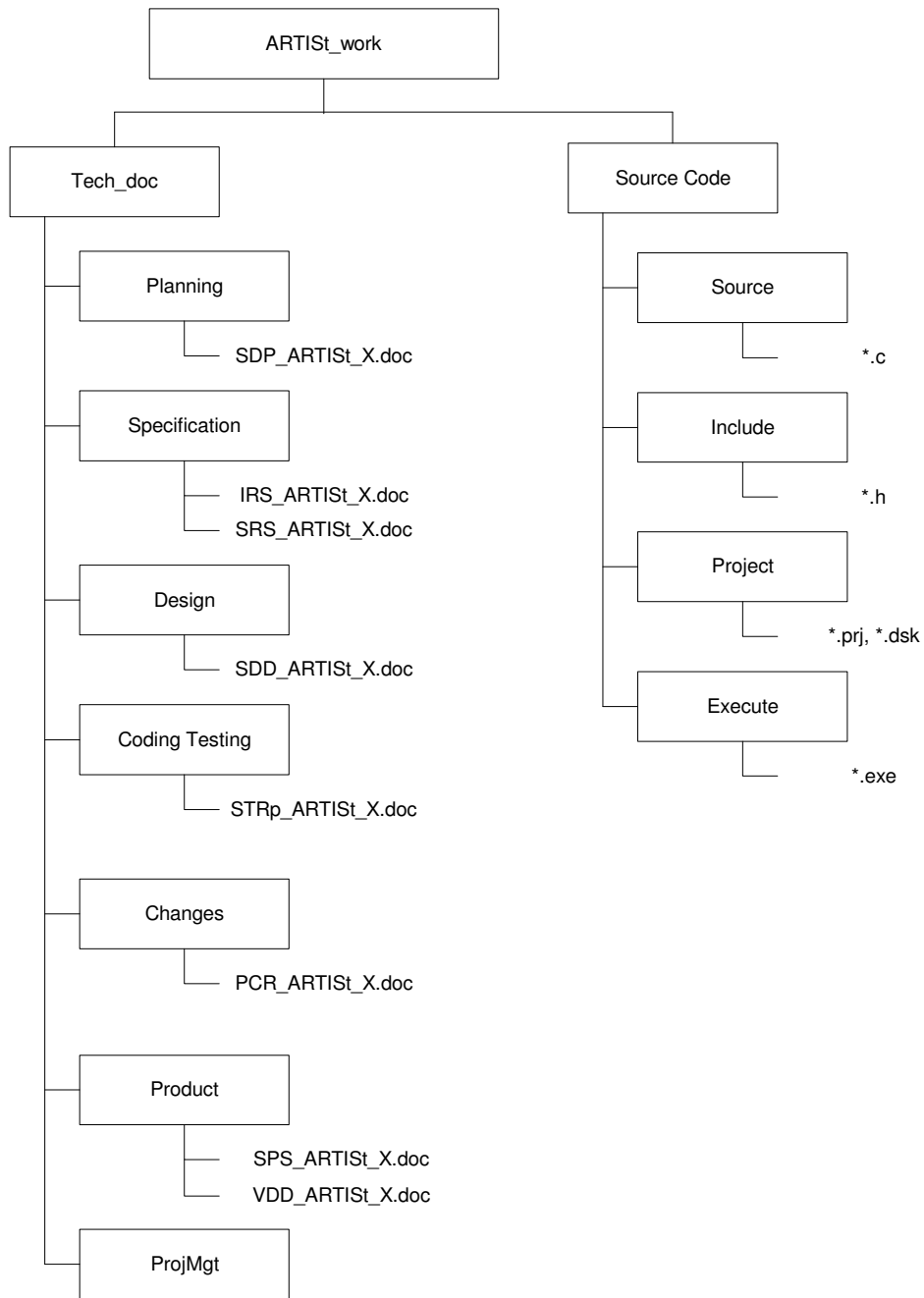


The Structure of Reference and Archiving Directories of ARTIST



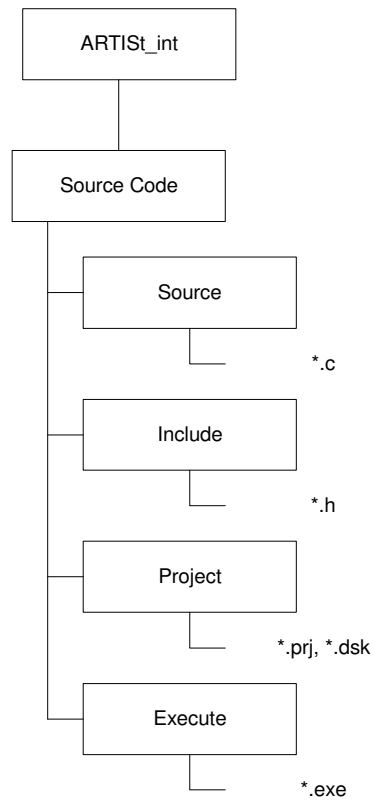


The Structure of Working Directories of ARTISt





The Structure of Integration Directories of ARTIST





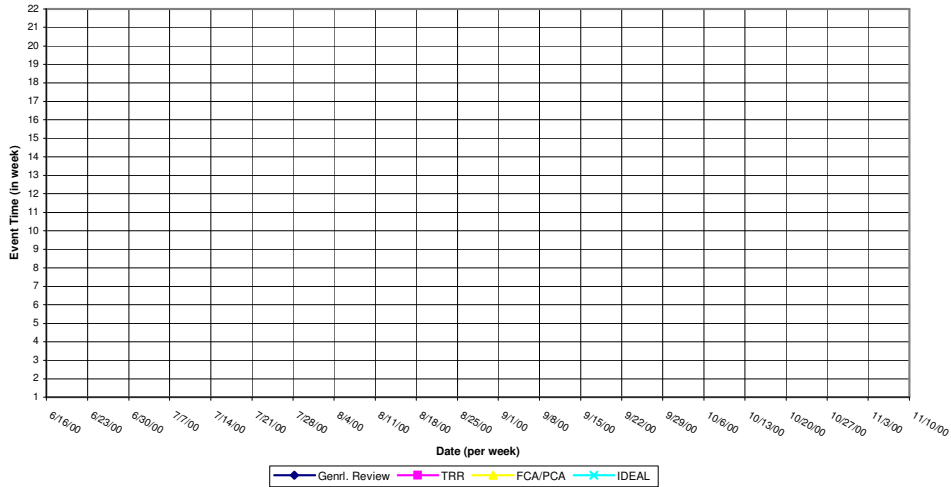
**SOFTWARE DEVELOPMENT PLAN for
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**Document No.
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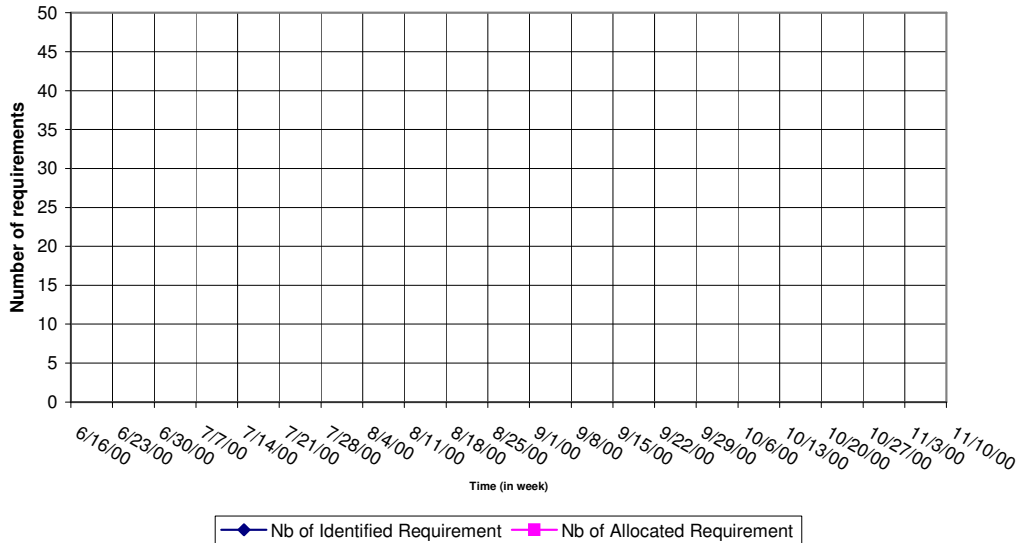
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APPENDIX F : "Project Tracking Forms"

ARTIST Milestones Tracking



ARTIST Requirement Tracking



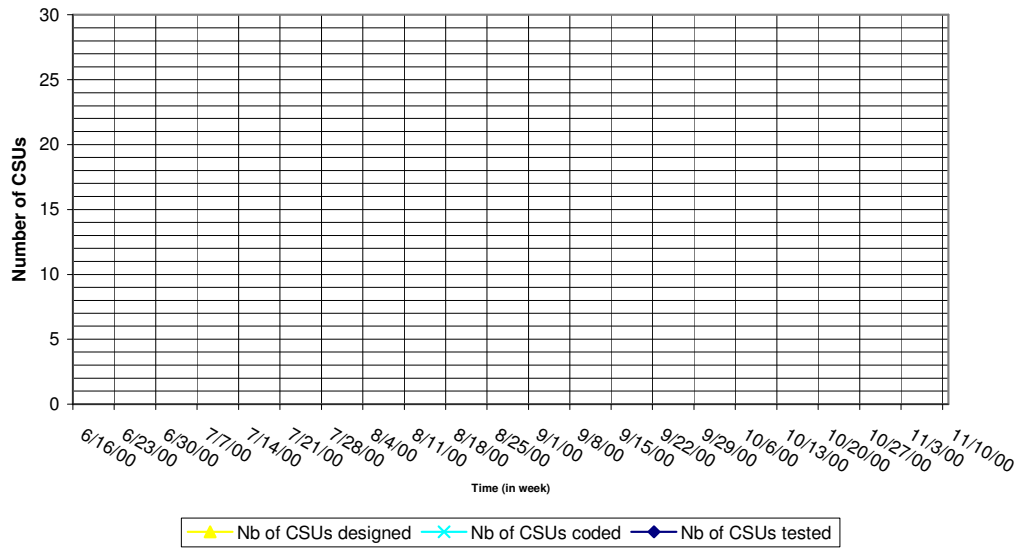


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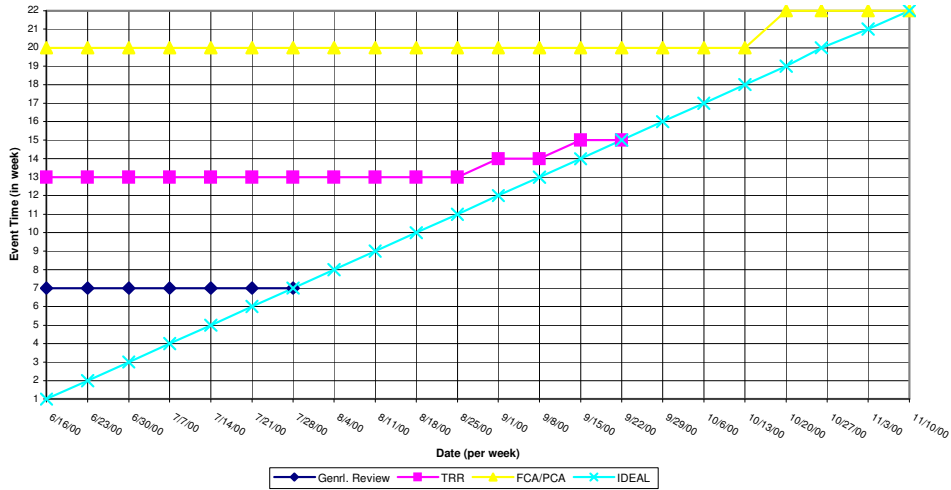
ARTIS CSU Tracking



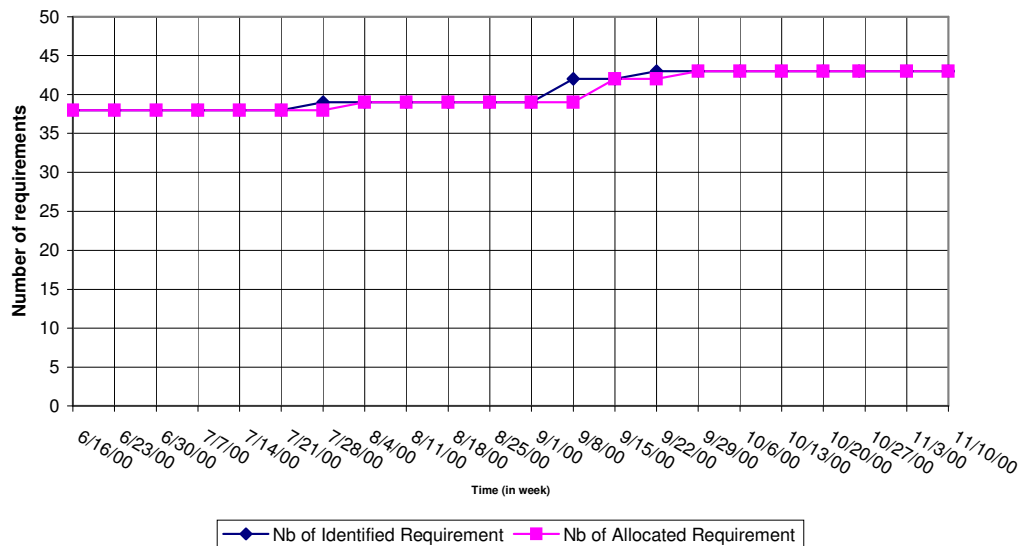


APPENDIX G : "Project Report"

ARTISt Milestones Tracking



ARTISt Requirement Tracking





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ARTIST CSU Tracking

