

Georgia Department of Transportation

NaviGator

Configuration Management (CM) Manual

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1. GENERAL OVERVIEW

The Georgia Department of Transportation (GDOT) will be constantly expanding and upgrading the NaviGator System over the next several years. This expansion will include new fiber optic backbone, communication hubs with associated communication electronics, additional field devices, and control center hardware. System software will also be expanded and enhanced to accommodate system growth. Expansion of NaviGator will include County, City and Regional Transportation Control Centers (TCC) as well as other public agencies such as MARTA, 911 Centers, and Hartsfield Airport. This expansion of NaviGator is a large scale initiative toward a state-wide Intelligent Transportation System.

Configuration Management (CM) is used by the Department to ensure the functional efficiency of the NaviGator system during expansion. Configuration Management is anchored by the Configuration Control Board (CCB) which reviews, approves, or rejects recommended changes to the NaviGator system. Organization and responsibilities of the CCB as well as detailed processes and procedures are detailed in this manual.

1.1 Objective

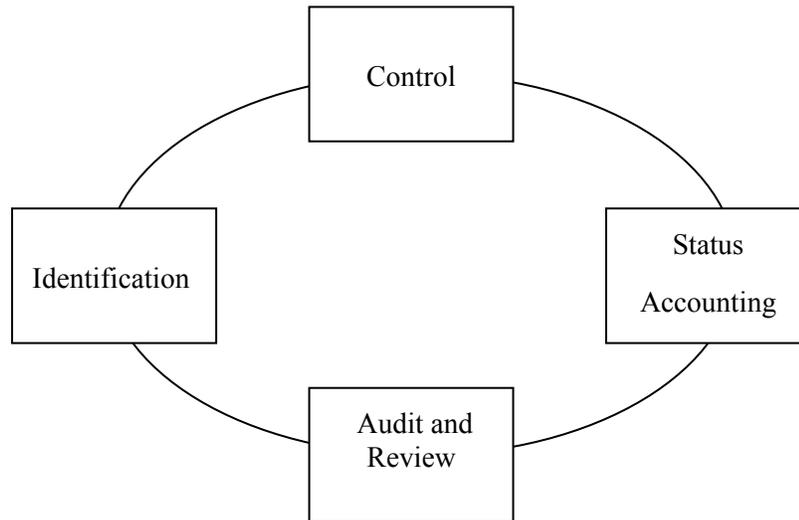
The objective of Configuration Management is to identify all NaviGator components and their relationships for the purpose of maintaining integrity, traceability, and control over change throughout their lifecycle. Configuration Management provides formal controls of the NaviGator system throughout all stages of expansion to include development, design, implementation, installation, maintenance, test and acceptance. It is intended to enhance the efficiency of the development effort by ensuring that the right work is being performed on the right version of application software or hardware system/subsystem. Finally, CM provides a mechanism for maintaining formal records of the NaviGator system configuration to include Software, Communications Cableplant, Field Equipment, Communication Electronics at Hubs, and Control Center hardware and documentation. This enables GDOT to effectively and efficiently plan further expansions to the NaviGator system in the future.

1.2 CM Manual Format

The CM Manual for NaviGator is a living document that will expand and be revised over time as required. Reasons for this may include new technology advances, need for automated processes, and additional items defined for CM control. The manual is divided into two distinct parts. The first part (main manual sections) provides a set of procedures used in the control of all CM items as defined by the CCB. These procedures are written at a broader level to not only provide sufficient information for these controls, but also to provide an easier understanding to the user community. The second part, actually an appendix, contains examples of forms, acronyms, definitions, and other aides that will provide additional information in qualifying the content of the main manual.

1.3 Configuration Management Process

Configuration Management is in no way a mysterious, magical tool, rather, it is a structured, detailed set of processes intended to help NaviGator System personnel to carefully document the current configuration of the system, and to provide a sound basis from which to consider making system changes. These processes are put into place and followed in order to achieve the primary goal of configuration management, to ensure the integrity of the system, and make its evolution more manageable. The four processes used in the NaviGator configuration management system are:



- **Identification** – All elements of the NaviGator system will be identified with a descriptor such as a name, number, version, etc. These elements include, but are not limited to, documents, drawings, software and hardware.
- **Control** – The control process assures that when changes are made to the NaviGator system, a stable configuration is maintained. An important part of the control process is establishing and preserving a stable system baseline. The main function that reviews and approves system baseline changes is the Configuration Control Board.
- **Status Accounting** – Status accounting involves recording and reporting of NaviGator’s system components and change requests. Status accounting is an on-going effort within configuration management to ensure that the system is well documented, and that necessary changes can be enacted with full information as to their potential impact.
- **Audit and Review** – The audit and review aspect of NaviGator’s configuration management process validates the system’s integrity. It ensures that the correct procedures are being followed and provides analysis for possible improvements.

2. GENERAL CONFIGURATION MANAGEMENT INFORMATION

2.1 Overview

This section of the CM manual contains general information about CM, members of the Configuration Control Board, baseline requirements, etc. not included elsewhere in this manual.

2.2 Configuration Management Team

The CM Management Team is comprised of key GDOT personnel responsible for the day-to-day operations of the NaviGator system. This team is responsible for the control, changes and enhancements of all operational areas affecting Configuration Management and is manifested in two distinct functions. The first function of the CM Team is to act as members of the CCB as described in Sections 2.4 and 4 of this manual. The second function is an overall administrative one, which oversees areas such as design reviews, monitors schedules and budgets, recommends new processes/procedures, etc. The following table defines NaviGator team responsibility as it relates to CM.

TEAM MEMBER	RESPONSIBILITY
CM Manager	CCB Chairperson
	Plans and implements overall CM program
	Prepares and provides CM status reports
	Provides CM Training
	Identifies CM resources
	Directs overall CM activities
	Maintains and develops CM procedures
	Plans and implements formal CM audits
	Identifies CM baseline requirements
	Attends formal project reviews
Program Manager	CCB permanent member
	Provides appropriate schedule, budget and resources
	Helps in planning overall CM program
	Oversees overall project reviews
	Identifies CM report requirements
	Helps CM Manager determine CM training for GDOT employees
	Helps CM Manager determine CM baseline requirements
CM Advisor	CCB advisor
	Recommends training requirements
	Recommends new CM procedures or changes to existing ones
	Helps CM Manager monitor overall CM activities

TEAM MEMBER	RESPONSIBILITY
Software Manager	CCB permanent member
Hardware Manager	Verifies that personnel are following CM procedures
Systems Integrator	Assists in CM audits
Operations Manager	Evaluates and manages COTS software (if applicable)
Design Manager	Provides Q/A evaluation and assurance of changes to baseline items
	Initiates and/or attends formal project reviews
	Help determine training requirements by providing expertise in each functional area.
Documentation Manager	Attend CCB as administrative help to CM Manager
	Maintains documentation repository
	Assists in CM audits
	Evaluates and manages COTS software (if applicable)

2.3 CM Baseline Requirements

In order to maintain Configuration Management of the NaviGator system, it is necessary to establish baseline configurations for the system software, communications cableplant, field devices, and all communications and control center hardware. The baseline configuration is established at a point in time when GDOT initiates formal control over documentation, drawings, and/or software. An audit of the existing NaviGator system, along with defined requirements for new projects, is used to establish the initial baselines. (Refer to Section 3.4 – Document/Drawing Revision Control, and Section 4.4 – The System Change Request (SCR).

2.3.1 Baseline Items

The following are considered to be baseline controlled items with the control timing of each defined. Once baselined, these items will require an SCR for any change. The CCB may chose to bring other items under baseline control as deemed appropriate. (Note that NaviGator hardware is actually defined on drawings and/or documents.)

a) **Documents** – NaviGator baseline documents include the following:

- **NaviGator System Documents** – These documents are defined on the GDOT NaviGator Document Structure (NAV01-001) and include manuals, guides, procedures, plans, etc. Baseline of these documents will occur at the point of final acceptance by GDOT.
- **NaviGator Hardware Documents** – These documents describe NaviGator hardware and are similar to the NaviGator infrastructure drawings listed below, only in document format. Baseline of these documents will occur at the point of final acceptance by GDOT.
- **Special Provisions (Base) Documents** – These documents are used as base specifications for new project development. Specification numbers include, but are not limited to, 631, 634, 682, 727, 935, 936, 937, 938, 939, and 940. These special provisions are currently under CM baseline control.

- **Special Provisions (Project) Documents** – Project special provisions are actually modified base special provisions listed above. They are used to define project specific requirements by adding, deleting or changing portions of the base provisions. New project special provisions are under baseline control at the point of final plan submittal to the GDOT contracts office.
- b) **Drawings** – NaviGator baseline drawings include the following:
- **Project Plan Drawings** – Project plan drawings include construction plans and NaviGator infrastructure detail drawings associated with the project special provisions noted above. These drawings will be baselined, along with the project special provisions, at the point of final plan submittal to GDOT Contracts Administration Office.
 - **NaviGator Infrastructure Drawings** – Infrastructure drawings include assemblies, elevations, floor plans, diagrams, etc., which define the overall NaviGator hardware structure. Baseline for these drawings will occur after drawing completion, Q/A check for integrity and accuracy, and finally, acceptance by the GDOT program office.
- c) **Software** – All NaviGator software is currently under baseline control. (Refer to Section 5 for additional software control information)

2.4 Configuration Control Board (CCB)

The Configuration Control Board is comprised of key GDOT personnel responsible for the configuration control decisions to the NaviGator system. It is the function of the CCB to review and approve or reject all requested changes for hardware, software, documentation and drawings that are under CM control. No changes are permitted to any CM controlled elements without the approval of the CCB.

The main vehicle by which changes are introduced to the CCB is the System Change Request (SCR) form. This completed form along with its supporting documentation will be used as the only source to implement a change to any data under CM control. (Refer to Section 4)

3. CONFIGURATION MANAGEMENT CONTROL PROCEDURES

3.1 Overview

The CM Manager and the Documentation Section for NaviGator, is the central control function responsible for all CM related policies, procedures and functions. This portion of the CM Manual defines most elements of CM that are controlled and maintained by the CM Section with the exclusion of the CCB, which is defined in Section 4. Included are the following:

a) Documentation/drawing management procedures.

In order to provide consistency and traceability of documents and drawings, methods by which they are produced and controlled must be established. These procedures establish the numbering convention, formats, revision control and issuance of numbers for documents and drawings.

b) Data archive and release control.

This procedure outlines the archive, release and overall control of documents, drawings, forms and software data. This is associated with new data releases and data updates as a result of SCR activity.

c) Training.

Continual training of personnel for established CM procedures is the most important part of the overall CM plan. This procedure establishes all training requirements for CM related activities throughout all department sections.

d) Status / Reports.

This procedure establishes the recording and reporting process for information needed to manage the functional and physical characteristics of CM items.

e) Audits.

A plan for the continual monitoring of CM processes and procedures must be established and maintained. This procedure establishes the required audits, their content and timing within the NaviGator overall CM process.

f) Commercial of the shelf (COTS) software control.

This procedure establishes controls placed in the review, purchase, storage and control of all COTS software for the NaviGator system.

3.2 Document/Drawing Numbering Conventions

3.2.1 Scope

This procedure describes the numbering conventions for documents, forms and drawings under CM control.

NaviGator documents are defined as follows:

- a) System level documents as defined in the GDOT NaviGator Document Structure Tree document NAV01- 001.
- b) Hardware documents defining NaviGator infrastructure.
- c) Specifications including base special provisions and project special provisions. Although specifications are controlled by state mandated requirements for numbering and date revision control, GDOT uses NaviGator numbers for internal SCR control use.

NaviGator drawings are defined as follows:

- a) Infrastructure drawings such as hub layouts, rack assemblies, facility drawings, fiber drawings, etc.
- b) Project specification drawings including construction plans, and infrastructure detail drawings.

NaviGator forms are defined as follows:

- a) All forms created and issued by the CM Manager to be used for the process of configuration management.

3.2.2 Reference/Related Documents

- a) NaviGator CM Manual – Section 3.3 (Document/Drawing Number Issue)
- b) NaviGator CM Manual – Section 3.5 (Document/Drawing Format Control)
- c) NaviGator CM Manual – Section 5.3 (Procedure – Software Development Steps and Reports)
- d) NaviGator CM Manual – Section 6.2 (Hardware Numbering)

3.2.3 Procedure

Each CM item will have a unique identifier assigned and maintained by the CM Manager. The location of the number will be as defined in Section 3.5 of this manual. Number identifiers are required for the following:

a) Documentation

All documentation as defined in the Scope above shall be numbered with a unique NaviGator number. The following numbering sequence represents the project (NAV), type 01 (document) with a sequence number starting at 001 through 999.

NAV01-001 through NAV01-999

b) Drawings (Hardware, electrical, construction plan sets)

All drawings as defined in the Scope above shall be numbered with project (NAV), type 02 (hardware/electrical drawings) and with a sequence number starting at 001 through 999.

NAV02-001 through NAV02-999

c) Forms

All forms including System Change Request (SCR), Software Change Description Document (SCDD), etc. shall be numbered with project (NAV), type 03 (form) and with a sequence number starting at 001 through 999.

NAV03-001 through NAV03-999

d) Software

Refer to Section 5.3.

e) Drawings (Cable)

All cable drawings as defined in the Scope above shall be numbered with project (NAV), type 05 (cable drawings) and a sequence number starting at 0001 through 9999.

NAV05-0001 through NAV05-9999

3.3 Document/Drawing Number Issue

3.3.1 Scope

This procedure describes how NaviGator document and drawing numbers are issued and controlled. Refer to the Scope in Section 3.2.1 of this manual for NaviGator document and drawing descriptions.

3.3.2 Reference/Related Documents

- a) NaviGator CM Manual – Section 3.2 (Document/Drawing Numbering Conventions)
- b) NaviGator CM Manual – Section 5.3 (Procedure – Software Development Steps and Reports)

3.3.3 Procedure

- a) All requests for new NaviGator document or drawing numbers will be directed to the CM Manager.
- b) A number must be requested and assigned to the document or drawing prior to any Q/A check, comment review, or any other function being performed outside of the originator's personal control.
- c) A title for the document or drawing must be supplied along with the request for a number. The CM Manager will approve all titles for consistency across the NaviGator project.
- d) There may be a need by a section or a contractor to receive a block of numbers due to the high volume of need. In this case, the CM Manager will issue a block of numbers as needed. The requestor must assign the titles to the corresponding numbers as used. This title information must be sent to the CM Manager as numbers are allocated.
- e) Obsolete (but previously assigned) numbers are not to be reused.
- f) The CM Manager will maintain an active up-to-date database of all issued numbers.

3.4 Document/Drawing Revision Control

3.4.1 Scope

This procedure defines the revision control to all NaviGator documents, drawings, and forms. Refer to the Scope in Section 3.2.1 of this manual for NaviGator document and drawing descriptions.

3.4.2 Reference/Related Documents

- a) NaviGator CM Manual – Section 2.3 (CM Baseline Requirements)
- b) NaviGator CM Manual – Section 3.5 (Document/Drawing Format Control)
- c) NaviGator CM Manual – Section 4 (Configuration Control Board (CCB))
- d) NaviGator CM Manual – Section 9.4.2 (Document Title/Revision Form (Revision Sheet))

3.4.3 Procedure

All CM documents, drawings and forms will be controlled by revision numbers as indicated below.

a) Draft Revisions

After a document or drawing is complete, it must be circulated for review and approval. This is a limited distribution with no intent for final general use. Although this represents a pre-baseline condition not under formal SCR control, a revision status must be added. All revisions under pre-baseline (Draft) control will have a zero followed by a decimal point and a number. As an example, the first draft revision on a new document or drawing never before baselined will be 0.1, the second revision will be 0.2 and so on.

b) Baseline Revisions

After a document or drawing is ready for distribution to the user community, formal SCR revision control is implemented. This point is when GDOT has accepted the document or drawing as being approved and ready for general distribution. As an example, the first baseline revision to a new document or drawing will be 1.0. Any change to the document must be initiated by submitting a System Change Request (SCR) to the CM Manager. After each CCB approved SCR, the number will increment by one number.

Examples:

First draft release of a new document or drawing for comment review:	Revision = 0.1
Second draft release for final comment review:	Revision = 0.2
* GDOT accepts new document or drawing:	Revision = 1.0
First SCR approval to update document or drawing, first draft revision:	Revision = 1.1
Second draft revision:	Revision = 1.2
* CM Manager accepts document or drawing after Q/A verification:	Revision = 2.0

* CM Manager or designee is responsible for actual update of revision at this point.

3.5 Document/Drawing Format Control

3.5.1 Scope

This procedure defines the standard format sizes and layouts to be used for all NaviGator documents and drawings.

3.5.2 Reference/Related Documents

- a) NaviGator CM Manual – Section 3.2 (Document/Drawing Numbering Conventions)
- b) NaviGator CM Manual – Section 3.4 (Document/Drawing Revision Control)
- c) NaviGator CM Manual – Section 9 (Appendix B – Forms and Examples)

3.5.3 Procedure

All NaviGator documents and drawings will use standard formats to assure consistency and accuracy across all NaviGator document/drawing requirements.

3.5.3.1 Documents (Other than Special Provisions)

- a) Documents are defined as mostly a word-processed method of describing procedures, instructions, results, or other information for software and systems.
- b) Documents will normally be 8.5 in. by 11.0 in. (A size). Inserts of a larger size may be included in the document if necessary. An example of this may be a tabulated list of data as an 11 in. by 17 in. foldout.
- c) All documents must be in electronic format in Microsoft Word format unless otherwise approved by the TMC Configuration Manager. All tabulated lists should be input as Microsoft Word “tables”. If lists are large in nature, they may be included as spreadsheets in Excel format.
- d) All documents must be submitted for baseline approval as one contiguous file. If spreadsheets exist, two files may be used to create the document, but travel together using Microsoft ‘Binder’
- e) Baseline controlled master forms must be used for all documents and are not allowed to be changed without an approved SCR. The master forms are available from the TMC Configuration Manager.
- f) The standard document form consists of a cover sheet, a revision sheet, table of contents and applicable document information following.
- g) The header on each sheet shall consist of the company logo on the right side of the page. The footer should be as shown as in the appendix example (Refer to Section 9.4.2). The footer will be the same on all sheets, but not appear on the title page.
- h) The cover sheet is to be completed as follows: (Refer to Section 9.4.1)
 - **Title:** The title is standard for the particular type of document being created as approved by the TMC Configuration Manager. For documents that will require future updates, perhaps for new software releases, the title should be generic without a software version number.

Examples: Software Development Plan
 High Level Software Design Document
 Master Test Plan

For documents that are a one time issue and will never be updated in the future, may have the Software version included as part of the title.

Examples: Systems Test Procedures- V1.2
 Detailed Software Design Document- V1.2

- **Prepared By:** The name and address of the company, which prepared the document.
 - **Date:** The date the document was prepared. If the document is changed due to SCR update approval, the date will correspond with the date shown on the revision history sheet. [Refer to i) below]
 - **Revision:** The current revision of the document.
 - **Document No.:** The number issued by the TMC Configuration Manager.
- i) The revision history sheet is to be completed as follows (Refer to Section 9.4.2):
- **Date:** The date of the revision.
 - **Rev:** The current revision of the document (Refer to Section 3.4).
 - **By:** The person's name who revised the technical aspects of the document.
 - **SCR:** The SCRs No.(s) that mandated the document change.
 - **Section:** The section(s) of the document where the change(s) occurred.
 - **Description:** Enter the description of the change(s).
- j) The table of contents sheet is to be completed as follows:
- Embedded links are to be entered between the page numbers in the table of contents and the actual document pages.
 - Preferred layout should be as shown in the table of contents of this manual.

3.5.3.2 Documents (Special Provisions)

- a) Format control for Special Provisions is dictated by state mandated requirements although the NaviGAtor document number and revision may be used for internal control. On all Special Provision Documents insert the Navigator number and revision on the first page only at the top left edge outside of the border.

3.5.3.3 Drawings (Other than Construction Plan Sets)

- a) Drawings are defined as pictorial representations of NaviGAtor infrastructure including layouts, assemblies, detail, schematic diagrams, system layouts, etc. They will also include information about the item(s) shown such as hardware type and location, connectivity, labeling, etc.

- b) Drawings will be represented in varying sizes as indicated below. Care must be taken to select the proper size drawing format that will best illustrate to drawing. Small size formats with multiple sheets are preferred for handling ease.
- A size - 8.5 in. x 11.0 in.
 - B size – 11.0 in. x 17.0 in
 - D size – 22.0 in. x 34.0 in.
- c) All drawings shall be produced electronically using Microstation software unless otherwise approved by the TMC Configuration Manager.
- d) Baseline controlled master forms must be used for all drawings and are not allowed to be changed without an approved SCR. The master forms are available from the TMC Configuration Manager.
- e) Drawings shall consist of a main (first) sheet along with continuation sheets if needed. A continuation sheet is similar to the main sheet except with a shortened title block allowing additional space for drawing content.
- f) For “A size” drawings, the first sheet should not be used for anything other than the revision history block. The second sheet should be used for all general notes which apply to the drawing.
- g) For “B and D size” drawings, the first sheet should have all general notes shown in the upper left hand corner. If space permits, the remainder of the first sheet may be used for other information.
- h) A six inch space should be allowed under the revision history block on all drawing sizes for history expansion. No drawing information should be placed in this area.
- i) The first sheet title block area should be completed as follows (Refer to Section 9.5.1):
- **Title:** The title is standard for a particular type of drawing being created. The title is approved by the TMC Configuration Manager.
 - Examples:** Assembly Drawing, Hub C- Rack Detail
 Layout Drawing, Hub C
 System Diagram, Hub C- Network Electronics
 Schematic Diagram, Hub C- Fiber Routing
 - **Drawing No.** The number issued by the TMC Configuration Manager.
 - **Rev:** The current revision of the overall drawing.
 - **Sheet:** The total number of sheets.
 - Examples:** SH 1 of 1 (For a single sheet drawing)
 SH 1 of 10 (For a ten sheet drawing)
 - **Scale:** The scale of the drawing.
 - Examples:** None (For a drawing with no scale)
 1:1 (For a one to one scale drawing)
 1:4 (For a quarter scale drawing)
 - **Project No:** The project number under which the project was created.

- **Drawn by:** The name of the individual who created the drawing.
- **Checked By:** The name of the individual who checked the drawing for accuracy.
- **Logo:** The company logo or name of the company contractually responsible for creating the drawing.

j) The continuation sheet (sheet 2), title block shall be completed as follows (Refer to Section 9.5.2):

- **Drawing No:** Same as sheet 1.
- **Revision:** This will be the revision of that particular sheet. While the first sheet will have the top overall revision for all sheets, a continuation sheet will only have the revision in which a change was made for that particular sheet.
- **Sheet:** The number of the applicable sheet.

Example: SH 3 of 10 (Third sheet of a ten sheet drawing)

- **Scale:** The scale of the drawing for that particular sheet.

k) The first sheet revision history block will be completed as follows (Refer to Section 9.5.1):

- **Rev:** The revision of the overall drawing which is identical to the revision in the title block.
- **SCR:** The applicable approved SCRs which initiated the revision.
- **Description:** A brief description of the change for this particular sheet. If changes were made to other sheets in a continuation sheet drawing, enter the sheet numbers affected.

Example: Changed note 3. Revised sheets 2, 4 and 8.

- **Date:** Date on which the revision was made.
- **Approved by:** Name of the person who validated the drawing revisions for completeness and accuracy.

l) The continuation sheet revision history block shall be completed similar to the first sheet only if a change has been made to that sheet.

3.5.3.4 Drawings (Construction Plan Sets)

a) Format control for Construction Plan Sets is dictated by state mandated requirements although the NaviGator drawing number and revision will be shown for internal control. On all Construction Plan Sets, enter the NaviGator drawing number and revision on the first sheet at the top right side above the revision block inside the border.

3.6 Data Release and Archive Control

3.6.1 Scope

This procedure defines the release and archive of data for NaviGator documentation, drawings and software. Included is new documentation and drawings not previously under baseline control, and revised documentation, drawings and software as a result of approved SCR updates.

3.6.2 Reference/Related Documents

- a) NaviGator CM Manual – Section 4 (Configuration Control Board (CCB))

3.6.3 Procedure

3.6.3.1 New Documents/Drawings Not Previously Baseline

- a) All new documents and drawings must have been created following all applicable related procedures as defined in this CM Manual.
- b) All new documents and drawings must have been through a Quality Assurance (Q/A) check process and validated by an appropriate section manager for accuracy and completeness.
- c) All electronically and manually produced data will be delivered to the CM Manager. If it is more conducive for data to be sent directly to the archive source, the CM manager will make the determination. (An example of this may be Microstation produced drawings by a contractor that will be archived by the Design Section directly)
- d) For documentation and any items under Document Control Section responsibility, the CM Manager, or designee, will enter the electronic data into the repository and file manually produced data according to the section standard operating procedures.
- e) CM Manager will document receipt of all archive data.

3.6.3.2 Documents Under Baseline Control

- a) Upon approval from the CCB for document update, the CM Manager will release the baseline data from archive to the person designated on the SCR for update. A due date will be issued by the CCB for completion of update.
- b) After data update and Q/A check, electronic or hardcopy data will be sent back to the CM Manager.
- c) The CM Manager will archive updated data into the appropriate repository and file the hard copy (if applicable)

3.6.3.3 Drawings Under Baseline Control

- a) Upon approval of the CCB for a drawing update, the Manager of the appropriate Section in which the drawings are stored will release the data for update and return them to archive after Q/A check is complete. A due date will be issued by the CCB for completion of the update.
- b) The section manager will notify the CM manager of update and archive within one day of completion.

3.6.3.4 *Software Under Baseline Control*

- a) Upon approval of the CCB for software update, the Software Section Manager will release data for update and archive in accordance with ClearCase software procedures.
- b) The Software Manager will notify the CM Manager when update, Q/A and archiving is complete.

3.7 Training

3.7.1 Scope

This procedure describes how CM training is scheduled and conducted for TMC, TCC, contract personnel or any others involved with NaviGator CM.

3.7.2 Reference/Related Documents

- a) NaviGator CM Manual – all applicable sections defined in the training requirements.

3.7.3 Procedure

- a) All training will be conducted by the CM Advisor, CM Manager, his designee or a combination thereof.
- b) The CM Manager will determine training requirements for the projected year. This may include new CM Manual procedures, Standard Operating procedures, training for new employees or a refresher course on existing procedures.
- c) Section Managers may determine any additional CM related training that their employees need and advise CM Manager of these requirements.
- d) A notice of training will be provided to the scheduled employees and their Section Manager at least two weeks prior to the training session.
- e) Training classes should be structured to include examples of real life problems and situations as they relate to the attendee's jobs and CM principles.
- f) Attendance should be taken at meetings with follow-up to appropriate managers as to meeting results.

3.8 Status/Reports

3.8.1 Scope

This procedure describes all status and reports generated by the CM Manager. Included are the SCR Status Report, SCR Analysis Report and the Audit report. The intent of these reports is to supply the CCB with overall knowledge of CM activity as it relates to approved CM activities.

3.8.2 Reference/Related Documents

- a) NaviGAtor CM Manual – Section 3.9 (Audits)
- b) NaviGAtor CM Manual – Section 4 (Configuration Control Board (CCB))

3.8.3 Procedure – SCR Status Reports

- a) CM Manager will maintain a status log of all SCR activity for both open and closed SCRs.
- b) The status log shall show all pertinent information for each SCR number as defined on the SCR. Information may include, but not be limited to, subject, priority, status, open/close dates, CAR Leader, current status, progress to date, and problem description.
- c) The status log shall be updated and made available to all CCB members normally on a weekly basis, but may be requested more often by the CCB.

3.8.4 Procedure – SCR Analysis Report

- a) The CM Manager will create and issue an overall SCR analysis report.
- b) The analysis report will extract all pertinent information derived from the total amount of SCRs during a certain time period. Information requested on this report will ultimately be determined by the CCB but will most likely include items such as amount of SCRs processed over the time period, total number of open/closed, length of data update times, etc.
- c) The report will normally be issued every three months but may be adjusted by the CCB if necessary.

3.8.5 Procedure – Audit Report

- a) The CM Manager will create and issue an audit report within five working days after completion of an audit.
- b) The audit report will consist of all areas reviewed, what criteria the reviews were based against, and the results of the findings.
- c) The report will list all recommendations for corrections to be made as a result of the findings.

3.9 Audits

3.9.1 Scope

This procedure defines the audit criteria used to assure that each GDOT section is using and following the procedures as outlined in both the CM Manual and the independent section Standard Operating Procedures.

3.9.2 Reference/Related Documents

- a) NaviGAtor CM Manual- (Entire manual)
- b) Section Standard Operating procedures
- c) Software Development Plan – NAV01-010
- d) Master Test Plan – NAV01-016

3.9.3 Procedure – GDOT Section Audits

- a) CM Manager and CM Advisor will conduct all audits with prior approval from the Program Manager. It is up to the discretion of the CM Manager to invite others to participate in an audit if necessary.
- b) Audits should be conducted on at least a quarterly basis within each section (as applicable), and perhaps more often when a new procedure or policy is put into place.
- c) The CM Manager will notify the Section Manager at least 5 working days prior to an audit. The CM Manager will convey to the Section Manager what the intent of the audit will be, what extent the audit will be performed, information to be on hand, employee participation, etc.
- d) The CM Manager, or designee, will keep notes during the course of the audit and issue a formal report to all members of the CCB within 5 working days after the audit is complete. (Refer to Section 3.8– Status/Reports)
- e) The audit will review, but not be limited to, the following:
 - Verification that all documentation, drawing, and software updates have been incorporated per approved SCRs.
 - Verification of all documentation, drawing and software revision levels.
 - Review of software development stages against applicable review reports and documents.
 - Review of data archive procedures and validation of current existing baseline directories.
 - Review of internal processes verified against section Standard Operating Procedures.
 - Establish basis for additional procedures to be created or existing ones to be modified, for both the CM Manual and section Standard Operating Procedures.
 - The CM Manager will create the SCR for any required changes to the CM Manual. The CM Manager may work with the CM Advisor on required changes if necessary.

3.9.4 Procedure – CM Manual Audits

It is necessary to have audits conducted on a periodical basis on the Configuration Management Manual itself as to its contents. The following procedure should be used:

- a) The CCB, as a whole, should periodically audit the content of the CM Manual including processes and forms, to verify that they are applicable to current conditions.
- b) The CCB will recommend to the CM Manager the creation of new procedures or changes to existing ones in the CM Manual. The CCB may also recommend the creation of new, or modification of existing section Standard Operating procedures.
- c) The CM Manager will create the SCR for any required changes to the manual and will update it after approval.

3.10 Commercial Off the Shelf (COTS) Software Control

3.10.1 Scope

This procedure describes the ordering, storage and general maintenance of commercial off the shelf software associated with the NaviGator system.

3.10.2 Reference/Related Documents

- a) Software Development Plan- NAV01-010
- b) Software Section Standard Operating Procedures

3.10.3 Procedure

- a) Refer to Software Development Plan (NAV01-010) for current COTS packages used in conjunction with the NaviGator software system
- b) All COTS software will be under control of the GDOT Software Section which will be responsible for the following:
 - Loading and testing of all software.
 - Resolving issues with software vendors as to functionality and defects including tracking and resolution of items affecting use.
 - Control of all licensing information including adherence to contract, yearly maintenance needs and approvals and upgrades if required.
 - Storage and dispersal of COTS documentation to all appropriate users if not available on line.
- c) All COTS upgrades and/or replacement shall be requested via SCR.

4. CONFIGURATION CONTROL BOARD (CCB)

4.1 Overview

The Configuration Control Board is comprised of a team of permanent members responsible for the configuration control decisions for the GDOT NaviGator system. It is the function of the CCB to review and approve or reject all requested changes for hardware, software, documentation and drawings that are under CM control. No changes are allowed to any CM controlled configuration items without the approval of the CCB.

The main vehicle by which changes are introduced to the CCB is the System Change Request (SCR) form. This completed form along with its supporting documentation will be used to request a change to any data under CM control.

It is not the intent of the CCB to be a preliminary investigation tool for problems. In most cases any potential changes to the NaviGator system will have a recommended resolution prior to the CCB meeting. If a problem does not have a simple resolution that can be defined by the originator, then a Change Assessment and Resolution (CAR) leader will be assigned by the CM Manager to accomplish this task. The CAR leader will consult with any GDOT or contract personnel as necessary to help with impact assessment and recommended resolution.

4.2 CCB Meetings

4.2.1 Scheduling

The CCB will have a regularly scheduled meeting date and time- normally every two weeks. This will normally be determined by the average number of SCRs submitted each month and their status. A meeting every two weeks is normally adequate to resolve most SCR issues. Other meetings may be called if an emergency exists or an unusual number of SCRs have been submitted. In all cases the CM Manager will schedule the meeting and notify appropriate personnel well in advance.

4.2.2 Conducting Meetings

The CM Manager or assistant will officiate all CCB meetings. The CM Manager will distribute the meeting agenda in advance of the meeting, which will list the SCRs to be acted upon and any other items of concern to the CCB. The CM Manager will introduce each SCR and call upon the originator or CAR leader for a presentation of the SCR. At the end of the discussion, the CM Manager will call for any CCB member to make a recommendation for approval, pre-approval or rejection of the SCR. He/she will also ask for a unanimous concurrence from the board. If a unanimous concurrence does not occur, the CM Manager will call for further discussion until all CCB members are in agreement. All decisions at the CCB will be recorded on the SCR and will appear in the SCR Status Log.

4.2.3 CCB Exclusions

There are two exceptions where CM controlled data can be excluded from the CCB meetings:

- a) If a change is very minor, such as a typo error correction, the CM Manager can correct the CM data without submittal to the CCB.

- b) If a CM document has been updated and comment reviews have been conducted by a TMC Project manager, the SCR need not be submitted to the CCB. The exception to this are Special Provision Documents which will remain under the full CCB process.

4.3 CCB Members

4.3.1 General

The permanent CCB members are key GDOT personnel who have overall knowledge of all aspects of the NaviGator system (Refer to Figure 4.1). This core team will resolve issues and make decisions based on inputs and recommendations from the SCR originator and/or the CAR Leader.

There may be times when additional personnel will be required to attend a CCB meeting. The CM Manager and/or CAR leader will determine which personnel, if any, will be required to attend. Examples may include Maintenance, Construction, Cabling and others. There may be other times due to an emergency when a minimum amount of CCB members will need to make a quick decision. In this case the CM Manager and Program Manager will decide course of action without a regularly scheduled meeting. (Refer to Section 4.4.3 item 8 priority: Emergency)

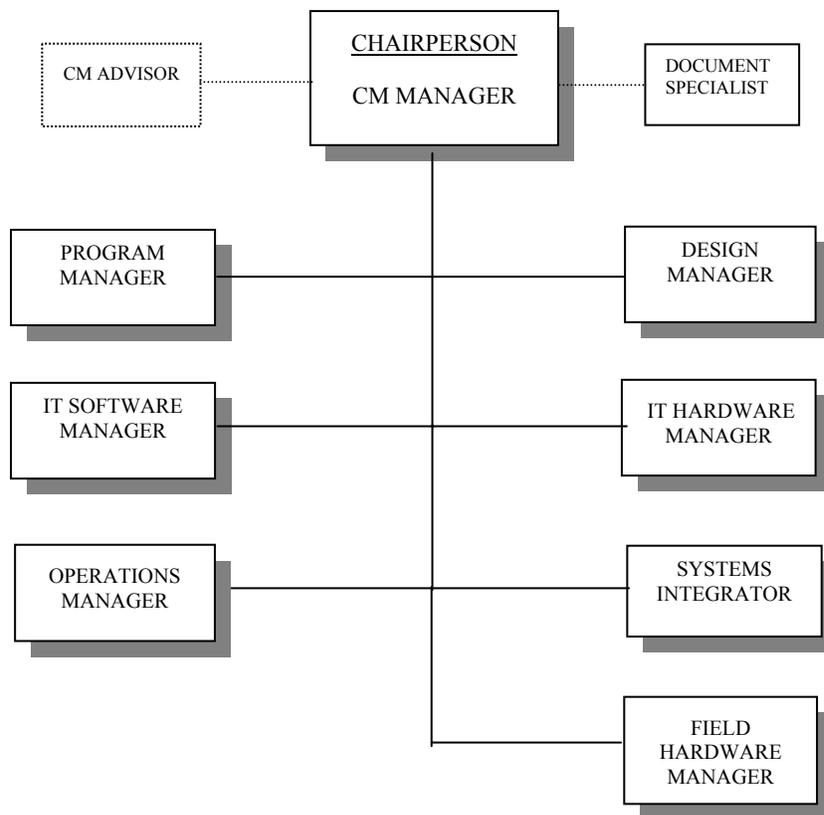


Figure 4.1: CCB Organization

4.3.2 Member Responsibility

- **CM Manager**
 - a) Schedules CCB meetings in conjunction with Program Manager.
 - b) Updates and issues status reports.
 - c) Assigns Change Assessment Resolution team leader if required.
 - d) Tracks progress of assessment team to assure timely progress.
 - e) Manages data repositories.
 - f) Manages and revises CCB related CM procedures.
 - g) Assures SCR and related information is complete and accurate.
 - h) Along with the Program Manager, requests additional personnel to attend CCB if needed.
 - i) Assures operational disciplines of the CCB CM process are being followed.
- **Document Specialist**
 - a) Works under direction of CM Manager to accomplish task listed above.
 - b) Operates required tools to facilitate CCB meetings.
 - c) Takes minutes during CCB meeting.
 - d) Manages/files documentation related to CCB.
- **CM Advisor (Contract personnel as required)**
 - a) Works with CM Manager in an advisory capacity to make any future change to CCB process.
- **Program Manager**
 - a) Works with CM manager to establish the CCB meeting times and attendance.
 - b) Oversees CCB from an overall technical standpoint.
 - c) Final decision for approval or rejection of SCRs.
 - d) Assigns resources as necessary to address CCB issues.

NOTE: The Program Manager will decide on his/her substitute in the event that attendance is not possible at the CCB meeting.
- **IT Software Manager, Operations Manager, Design Manager, IT Hardware Manager, Field Hardware Manager, Systems Integrator**
 - a) Possible CAR Leader. (Refer to Section 4.5.2 line 4. CAR Assignment)
 - b) Advises CCB in all matters as they relate to proposed change for his/her appropriate section.
 - c) Assures timely completion of any task assignments for personnel under his/her direction.
 - d) Act as Q/A function for updates to baseline data within section.

4.4 The System Change Request (SCR)

4.4.1 General

The SCR (form no. NAV03-001) is used as the initiating instrument for changes to NaviGator's CM data. This data includes hardware, software, documentation and drawings that have been considered as baseline in the NaviGator system. The main purpose of the SCR is to document all information from the beginning of a change request, the approval or rejection of the requested change by the CCB, and finally the update of the affected revision controlled information if approved.

Normally one SCR is submitted per problem or needed enhancement. There may be times that upon SCR assessment that it is best to split it into two or more separate SCRs. An example may be when a change to a fiber optic cable assignment is required immediately but software will not be changed until a future date. In this case the CM Manager may decide to create an additional SCR and separate the original one. The original SCR may have to be changed to accommodate the applicable wording.

4.4.2 SCR Form Responsibility

The SCR process is only as good as the information provided. It is a fairly simple tool to use but yet provides enough history for tracking and decision making purposes. Listed below are the personnel responsible for completing the form. (Refer to Section 9, Appendix B – Forms and Examples for example of SCR form)

- **The Originator (SCR form white area)** – The originator starts the SCR process. The originator must determine if the proposed change affects a CM controlled item and the type of change that will be submitted. (Refer to Section 4.4.3 item 5. Type of Change) If the type is “Stand Alone”, items 1 through 12 must be completed. If the type is designated as “Assessment Required”, items 7, 8, 10, 11 and 12 will be left blank for the CAR Leader to complete. Note: If originator cannot determine if SCR affects a CM item or if it needs assignment to a CAR Leader, he/she should contact the CM Manager.
- **The CAR Leader (SCR form white area)** – The CAR leader, assigned by the CM Manager, is responsible for the accuracy of information provided by the originator and the completion and/or validation of items 7, 8, 10 and 11 on the form.
- **The CM Manager (SCR form shaded area)** – The CM Manager has overall responsibility for the integrity of the form including the accuracy of existing information and completing or revising information during its life cycle. Other responsibilities connected with the SCR are assigning the CAR leader, maintaining the SCR status log, chairing CCB meetings, and controlling data updates.

4.4.3 SCR Item Description

Listed below is a description of each individual item on the SCR form. The number of the item corresponds with the number in each box of the form. (Refer to Section 9, Appendix B – Forms and Examples for example of SCR form)

1. **Originator:** – Name of individual initiating the requested change.
2. **Section:** – The name of the section in which the originator works. If originator is a contractor, enter company name.
3. **Date:** – Date that the SCR is completed by originator or his/her supervisor.

4. **Subject:** – An appropriate subject title depicting the requested change.
5. **Type of Change:**
 - a) **Stand Alone** – The “stand alone” SCR is one that is normally a simple change. This could be a wording change to a document, a view change on a drawing or a simple change to software that normally does not affect any other area and requires no additional assessment by others. In this type of change the originator knows exactly what document number, drawing number or software version is affected.
 - b) **Assessment Required** – The “assessment required” type is used when investigation is required for total change impact on all areas. This type will require an assignment of a CAR Leader to study the problem and prepare supporting information for a recommended solution.
6. **Reason for Change:**
 - a) **Defect/Error** – This reason for change is due to a defect or error to the original baseline item or past revision or version.
 - b) **Improvement** – This reason provides an improvement to existing hardware, software, etc.
 - c) **Addition** – This reason results in change to existing CM data due to additional new requirements.
7. **Affects:** – A change may affect one or more of the following. Check all that apply.
 - a) **Software** – Indicate if requested change affects software.
 - b) **Hardware** – Indicate if requested change affects any hardware. Note that all NaviGator hardware and cabling will be depicted upon drawing concepts.
 - c) **Documents** – Indicate if requested change affects any documents.
8. **Priority:**
 - a) **Emergency** – This is authorized if a change request must be resolved quickly to avoid a major impact to a particular operation, design, method, etc. Depending on when the problem is found in relationship to a scheduled CCB meeting, this priority SCR may be acted upon by the CM Manager and Program Manager in advance of meeting. If an SCR is handled as an emergency, it still must be brought before the CCB to establish results and closure.
 - b) **Urgent** – An urgent request is one that can normally can wait for the next scheduled CCB meeting but the originator feels that it has a high impact to operations, design, methods, etc. An urgent request is one that should be acted on quickly and perhaps as a priority item.
 - c) **Routine** – A routine request is one that should be implemented to best fit schedule.
9. **Description of Condition:** – A description of the condition should be complete enough for the CCB and/or the CAR Leader to understand. If the space provided is not adequate, or, if additional documentation is required, a continuation sheet may be used. If this is the case, a general paragraph must still be entered with the “additional data attached” block checked. If description of problem is continued on the second sheet, indicate by the wording “description of condition cont’d.”
 - a) **Additional Data Attached** – Additional documentation may be attached if needed to further clarify the existing condition.

- 10. Recommended Solution:** – Similar to the description of condition above, a paragraph must be entered for the recommended solution. It will be more likely that there will be supporting data to be included. If this is the case, the “supporting data attached” block is checked and the documentation is to be added as continuation sheets to the SCR.
- a) **Supporting Data Attached** – Supporting documentation is any information that the CCB may need to validate the recommended solution. This may be information such as cost impact (hours or dollars), schedule delays, other alternate approaches and their results.
- 11. CAR Team Consulted:** – Enter the names of all team personnel that were consulted and/or reviewed the proposed solution for the SCR. If no one is consulted enter “none”.
- 12. Doc/Dwg/SW No. Affected:** – All data to be revised due to the change must be listed here. These may include software, documentation and drawing numbers and specification numbers. In all cases, the revision (for documents and drawings) or version number (for software) that the data is presently at will be entered if known. If it is found that the originator or CAR Leader entered has missed a number or entered an incorrect number, the CM Manager will make the appropriate change or addition as a result of the CCB meeting.
- Examples: NAV01-002
 NAV02-008
 NAV04-001
- 13. CAR Leader:** – The name of the CAR Leader will be entered. The CAR leader will be determined by the CM Manager.
- 14. Due Date:** – The date set by agreement between the CM Manager and the CAR Leader to have analysis complete. This date should correspond a minimum of 3 working days prior to a scheduled CCB meeting.
- 15. CCB Mtg:** – The date of the CCB meeting.
- 16. Name:** – If the CCB requires additional information to be submitted prior to change approval, the name(s) of the individual(s) responsible for the information are listed.
- 17. Assignment:** – A brief explanation of the individuals task assignment is listed.
- 18. Due Date:** – The date that the task assignment is due.
- 19. Approval:**
- a) **Pre Approved** – This will be checked if the CCB has given tentative approval based on the future submittal of additional information.
- b) **Approved** – This is checked when CCB authorizes changes to be made to existing CM controlled data.
- c) **Rejected** – This is checked if the CCB determines that the proposed change is not valid.
- 20. Notes** – The CM Manager will enter any pertinent information as a result of the CCB meeting.
- 21. Data Update Assignments:**
- a) **Doc/Dwg/Software No.** – Everything under CM control has a number assigned to it. The number of the document, drawing or software to be updated is listed here.

- b) **Old Rev/Ver** – For documents and drawings the letter entered will be the current revision. For software, the current version number will be entered.
 - c) **New Rev/Ver** – For documents and drawings the letter entered will be next letter higher than the old letter. For software, the version number will be assigned by the CCB. Note- There may be times when a software version cannot be assigned for a future build. In this case the word “open” will be used.
 - d) **Data Update By** – The name of the individual responsible for the actual data update. If an individual cannot be named, then the section or subcontractor’s name will be entered.
 - e) **Q/A By** – The name of the individual responsible to insure the integrity of the updated data.
 - f) **Due Date** – The date that all data is due back from Q/A for re-entry into data repository. This will be determined by the CM Manager.
22. **SCR No.:** – The SCR tracking number issued by the CM Manager. This will normally be a number starting with 01 for the first SCR.
23. **Parent No.:** – When an original SCR is split resulting in two or more SCRs, the number of the original (parent SCR is entered).
24. **SCR History**
- a) **Log Date** – The date when the SCR was received by the CM Manager and entered into the status log.
 - b) **Ready CCB** – The date that the SCR is ready for the CCB.
 - c) **CCB Date** – The date of the approved or rejected SCR by the CCB.
 - d) **Close Date** – The date that all work is completed, validated and data returned to repository.
 - e) **CM Manager** – The name of the individual that validated the SCR and reviewed updated data (if possible).
25. **SH 1 of (bottom of form)** – If attachments are included as part of the SCR, add number for total amount of sheets.

4.5 SCR Process Flow

4.5.1 General

The process flow of changes through the CCB must be an exacting one. All personnel related to this activity must follow the procedures outlined to assure the integrity of the process. The CCB meetings are normally scheduled at specific times and dates but may be adjusted according to need. It is important therefore that each person involved with the process takes quick action to complete SCR requirements. This will assure the fastest timing possible into a CCB meeting. CCB meeting agendas will be issued by CM Manager approximately two working days prior to CCB meeting.

4.5.2 Specific Flow and Definition

(Refer to Figure 4.2)

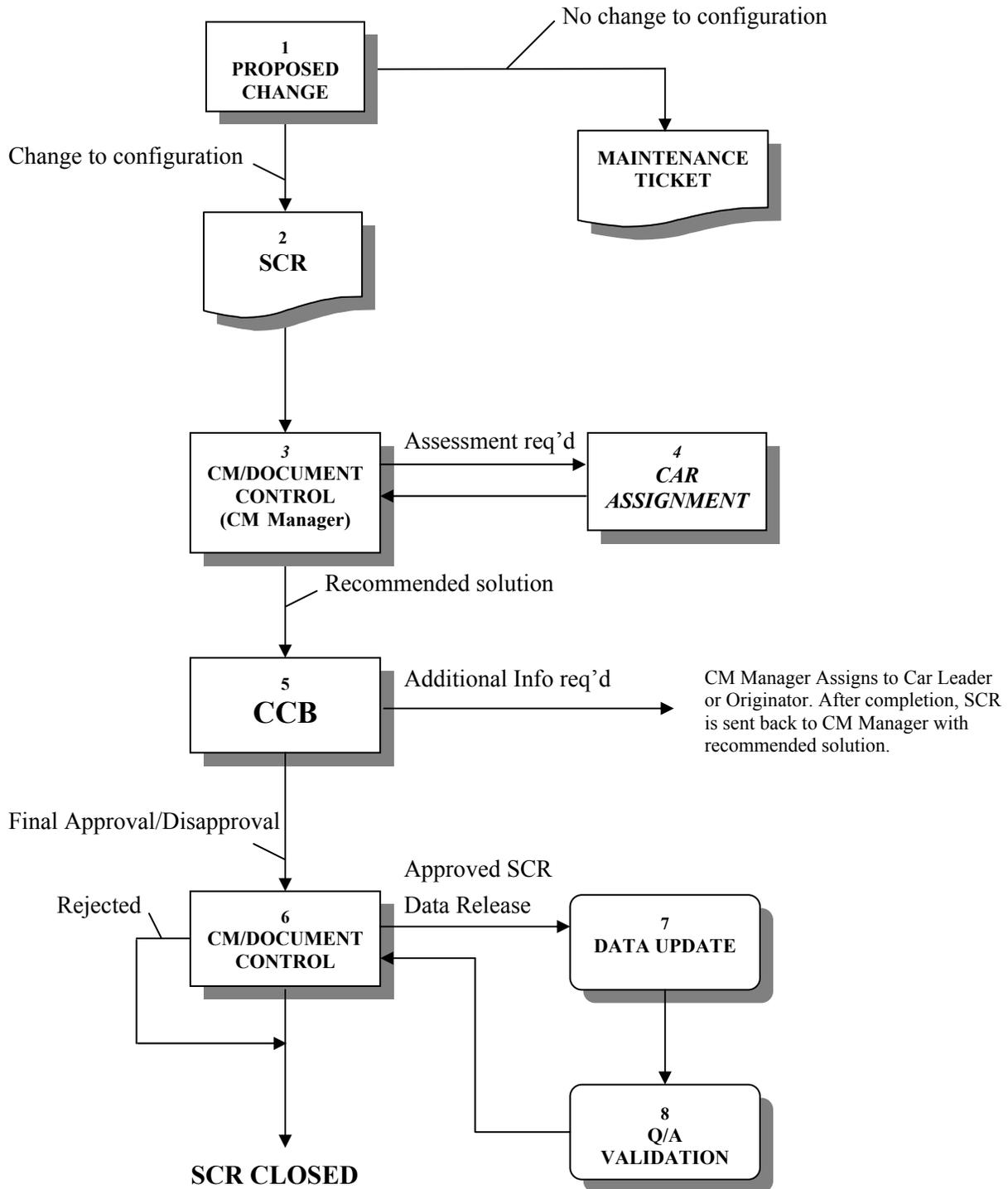


Figure 4.2: SCR Flow

1. **PROPOSED CHANGE:**

A proposed change to a baseline item may be initiated by anyone but it is imperative that an accurate determination is made whether or not making the change will result in altering configuration data. The person initiating the change may have to consult with his/her supervisor to validate the action. If it is determined to be no impact to system configuration, a maintenance ticket is completed. If proposed change results in a change to a configuration item, an SCR is required.

2. **SCR:**

A SCR form is required for each change to a baseline CM controlled item(s). One SCR should be generated for each problem or related change. (Refer to Section 4.4.3 for SCR form completion, and Section 9, Appendix B – Forms and Examples for form and examples). Originator of SCR is responsible for:

 - a) Using current valid SCR form obtained through CM Manager.
 - b) Completing the form electronically. If additional data attachments are required, they too should be submitted electronically if possible. If not, marked prints must be forwarded to CM Manager referencing the applicable SCR.

3. **CM/DOCUMENT CONTROL:**

CM/Document Control will review the SCR and attachments for completeness and accuracy. The SCR may be rejected if valid information is missing. If SCR is designated as an emergency by the originator, an SCR tracking number will be assigned and will be forwarded immediately to the Program Manager for a discussion on the course of action. For all other accepted SCRs the following will occur:

 - a) SCR log number will be assigned.
 - b) If required, a CAR Leader and action due date is assigned.
 - c) SCR will be added to status report. (Refer to Section 3.8 for status/reports)
 - d) CCB agenda, with applicable SCRS, is created and issued for next meeting.

4. **CAR ASSIGNMENT:**

It is the function of the CAR leader to provide sufficient study and analysis for making a recommended solution to the CCB. Often the SCR will describe a condition that may affect several GDOT Sections. The Car Leader, with help from the CM Manager, will determine which personnel must be contacted as part of a “CAR Team”. The team may consist of GDOT personnel, contractors or both. In specific, the CAR Leader is responsible for:

 - a) Determines if SCR is valid. If determined that SCR is not valid, The CAR Leader must consult with CM Manager with intentions to reject the SCR at the next CCB meeting.
 - b) If SCR appears to be valid, the CAR Leader must determine if the SCR may affect other GDOT Sections, i.e. Software, Design, Maintenance, etc. Using the list of possible Section contacts supplied by the CM Manager, determine appropriate personnel for the team.

- c) The CAR Leader will arrange meeting and/or phone conferences with appropriate team members to help provide a resolution for the SCR. As a minimum, the team should review the results of the resolution if the CAR Leader made decisions outside of the team.
- d) Provides the solution to the SCR condition along with the list of team members consulted. (Refer to Section 4.4.3 item 11. CAR Team Consulted).
- e) Justifies recommendations at CCB meeting.

5. CCB:

The CCB will review the SCR using the following criteria:

- a) Is the SCR complete enough to understand the existing condition and make an approval/rejection decision?
- b) Is the change request for a baseline controlled item?
- c) Is the change valid? Does it fix a problem or make an improvement?

It is the intent that the CCB approve or reject the SCR at the initial meeting, but there may be times that additional information, testing, investigation, etc. is required before final approval can be issued. In this situation clear and concise task assignments along with due dates are made with the intent of final resolution at the next CCB meeting.

The final action of the CCB is approval or rejection of the SCR. If approved, the names of the individuals or functional area responsible for the change and Q/A of baseline information along with task description, software version, document number or drawing number and due date are listed. In all cases of approval or rejection, the residing person's name for CM Manager will be entered on the SCR to indicate authorization along with date.

6. CM/DOCUMENT CONTROL:

The CM/Document Control section is responsible for documenting and tracking the release and return of software, documentation, and drawings for the update process. (Refer to Section 3.6) In specific:

- a) Authorizes releases data for update per SCR
- b) Tracks status of update and Q/A to assure timely completion.
- c) Closes SCR when validation of all software and documentation updates are complete and validated by Q/A. In the case of software related SCRs, the SCDD document must be completed and test results verified.
- d) Authorizes move of revised data to data repository.

7. DATA UPDATE:

Those personnel, or functional areas, listed on the SCR are responsible for the update of the baseline data upon release from Document Control. The update must follow the directive of the SCR, supporting documents, and revision control guidelines of this manual. (Refer to Section 3.4).

8. Q/A VALIDATION:

It is imperative that all revised data is reviewed and approved by a person assigned the Q/A function by the CCB. Once the update is approved, the CM Manager is notified that the change is complete and, in the case of

documentation or drawing changes, revised data is returned.

9. SCR CLOSED: In all cases of approval or rejection, the CCB and SCR originator will be notified of status.

5. SOFTWARE MANAGEMENT PROCEDURES

5.1 Scope

This procedure describes Configuration Management activities to be followed within the NaviGator software development cycle. Included in this procedure is the software development steps and required reports, CM identification and CM change control relating to the NaviGator software module.

5.2 Reference/Related Documents

- a) Software Development Plan – NAV01-010
- b) Master Test Plan – NAV01-016
- c) NaviGator CM Manual – Section 3.2 (Document/Drawing Numbering Conventions)
- d) NaviGator CM Manual – Section 3.3 (Document/Drawing Number Issue)
- e) NaviGator CM Manual – Section 4 (Configuration Control Board (CCB))

5.3 Procedure – Software Development Steps and Reports

The CCB will manage and oversee the activities associated with the NaviGator software development cycle as shown in Figure 5.1. The figure explains the steps of the development cycle, the reviews/test to monitor the standard and/or compliance of the product with the corresponding requirements in each step, and the documents to be produced or updated during the cycle.

5.3.1 Report Requirements

Refer to (to be determined) which describes the general format and content required for each document listed below.

1. System Requirements Specification

The NaviGator High Level System Requirements Specification specifies the technical and mission requirements for the system as an entity, and methods to ensure that each requirement has been met. Requirements pertaining to the system's external interfaces will also be explained.

This Specification will be used as a basis for system level design changes and subsequent testing of the system. A new document must be created for each software version.

2. High Level Software Design Document

The High Level Software Design Document describes the architecture components which make up each CSCI and the interfaces between them. It also allows for verification of the software design prior to detail design. Requirements specified in the Software Requirements Specification (NAV01-011) are allocated to these lower level components. Updating this existing document for a new software version may be required.

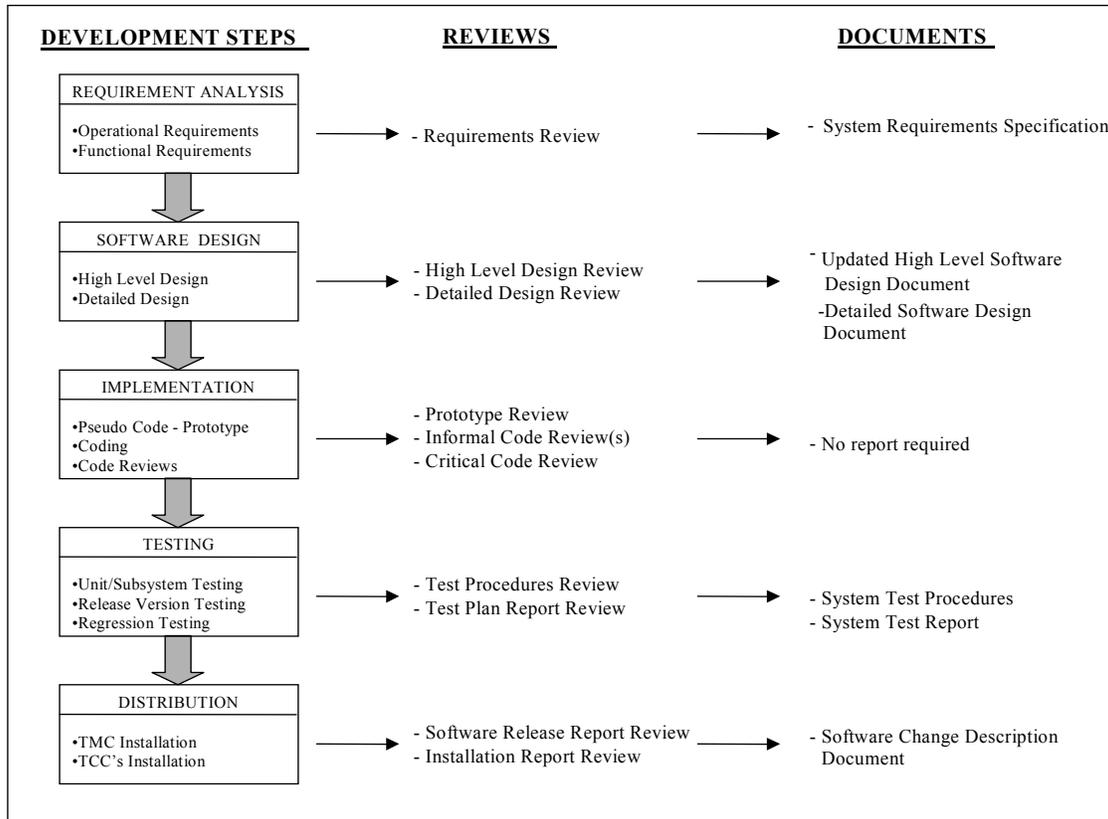


Figure 5.1: Software Development Cycle

3. Detailed Software Design Document

The Detailed Software Design Document completes the description of the software design by detailing the design, behavior and interfaces for all software units within a CSCI. Each unit defined is traceable back to the requirements allocated to a CSCI in the Software Requirements Specification (NAV01-011).

This document describes the software at a level suitable for the start of code and test phase. This document provides the last chance to review a software design and correct deficiencies before errors present themselves in the testing phase. A new document must be created for each version.

4. System Test Procedures

The System Test Procedure describes the test preparations, test cases and test procedures to be used to perform qualification testing of the integrated NaviGator System, a HWCI, or a CSCI.

Each test procedure will have traceability back to its applicable System, HWCI or CSCI requirements. Additionally, each System, HWCI or CSCI requirement shall have traceability to a test(s) included in the test plan. If a case addresses multiple requirements, the traceability should indicate the particular test procedure steps that address each requirement. A new procedure must be created for each software version.

5. System Test Report

The System Test Report is a record of the qualification testing performed on the NaviGator System, HWCI or CSCI used to assess the testing and its results. A new report must be generated for each software version.

6. Software Change Description Document

The Software Change Description Document is a record of enhancements and/or defect fixes along with the associated SCR numbers.

5.4 Procedure – Configuration Identification

Each baseline CM element is assigned a unique name and number for traceability. This section describes the method to be used in identifying Subsystems and Modules.

- a) All NaviGator’s subsystems are to be abbreviated by identifiable acronyms typically consisting of between 3 and 5 characters. The following are examples of subsystem acronyms:
 - ATIS – Traveler Information System
 - CMDA – Changeable Message Sign System
 - GUI – Graphical User Interface Library
 - STAM – Alarm Monitoring System
- b) All NaviGator modules and their subsystems shall be numbered with a unique NaviGator number. Examples of modules are the NaviGator software, the Intranet and Internet Application software and the GIS Basemap and Tool software. The following numbering sequence examples represent the project (NAV), type 04 (software) with a sequence number starting at 001 through 999.
 - NAV04-001 The NaviGator software (entire module)
 - NAV04-002 ATIS
 - NAV04-004 CMDA
 - NAV04-013 GUI
 - NAV04-024 STAM

5.5 Procedure- Software Change Control

To monitor and control the software development process, two mechanisms have been put in place which are the System Change Request (SCR) and ClearCase, a software management tool. The SCR is used for approval prior to any change to the NaviGator software, and ClearCase is the Change Management System used to actually control and integrate the software changes.

- a) No changes are allowed to NaviGator software without a pre-approved SCR by the CCB.
- b) An SCR must be created for each software defect or additional feature request.
- c) The SCR must be completed in compliance with Section 4.4 of this manual.

- d) All software shall be developed utilizing the ClearCase Change Management Software.
- e) The approved SCR number must be linked directly to the ClearCase management system to authorize the release of software for update.
- f) All NaviGator software development shall be in accordance with the NaviGator Software Development Plan.
- g) Software SCRs cannot be closed until the Software Change Description Document is complete and software test results have been verified and approved.

6. HARDWARE MANAGEMENT PROCEDURES

(This procedure, to be completed at a later date, covers the numbering and labeling of hardware components.)

7. DESIGN CONFIGURATION MANAGEMENT PROCEDURES

7.1 Scope

This procedure defines CM controls used for documentation and drawings during the design process. Included in this procedure are what items are under CM control, production of design related drawings and SCR submittal timing.

7.2 Reference/Related Documents

- a) NaviGAator CM Manual – Section 3.2 (Document/Drawing Numbering Conventions)
- b) NaviGAator CM Manual – Section 3.3 (Document/Drawing Number Issue)
- c) NaviGAator CM Manual – Section 3.4 (Document/Drawing Revision Control)
- d) NaviGAator CM Manual – Section 3.5 (Document/Drawing Format Control)
- e) NaviGAator CM Manual – Section 4 (Configuration Control Board (CCB))

7.3 Procedure

7.3.1 Items Under CM Design Related Control

- a) NaviGAator infrastructure drawings including hub equipment and layouts, TMC and TCC equipment and layouts, duct banks and fiber optic cable.
- b) Construction Plan Drawings
- c) Special Provisions (base specifications used for all projects)
- d) Project Special Provisions (Special Provisions that have been modified for specific projects)
- e) NaviGAator Software (if applicable)

7.3.2 Document/Drawing Production

- a) Where possible, all existing NaviGAator infrastructure drawings should be used in the production of the construction plan set drawings directly without modification.
- b) In cases where infrastructure drawings cannot be used directly, they may be copied and modified to accommodate the construction plan set requirements.
- c) When existing infrastructure drawings are copied and modified, the originals are subject to CM control (SCR submittal) if the integrity of the drawing changes in any manner. The correct method to perform this task would be to modify the original drawing via an SCR, then after drawing update, copy this drawing into a new drawing and re-identify it with a new NAV drawing number.
- d) If new drawings and documents are required for the design project, formats, numbering and revision control must conform to the reference/related documents listed in Section 7.2 of this procedure.

- e) All new documentation and drawings including new infrastructure drawings, construction plans, and project special provisions, are to be baselined and brought under CM control upon submittal of final plans to GDOT Contracts Office.

7.3.3 SCR Submittal and Timing

(Refer to Figure 7.1)

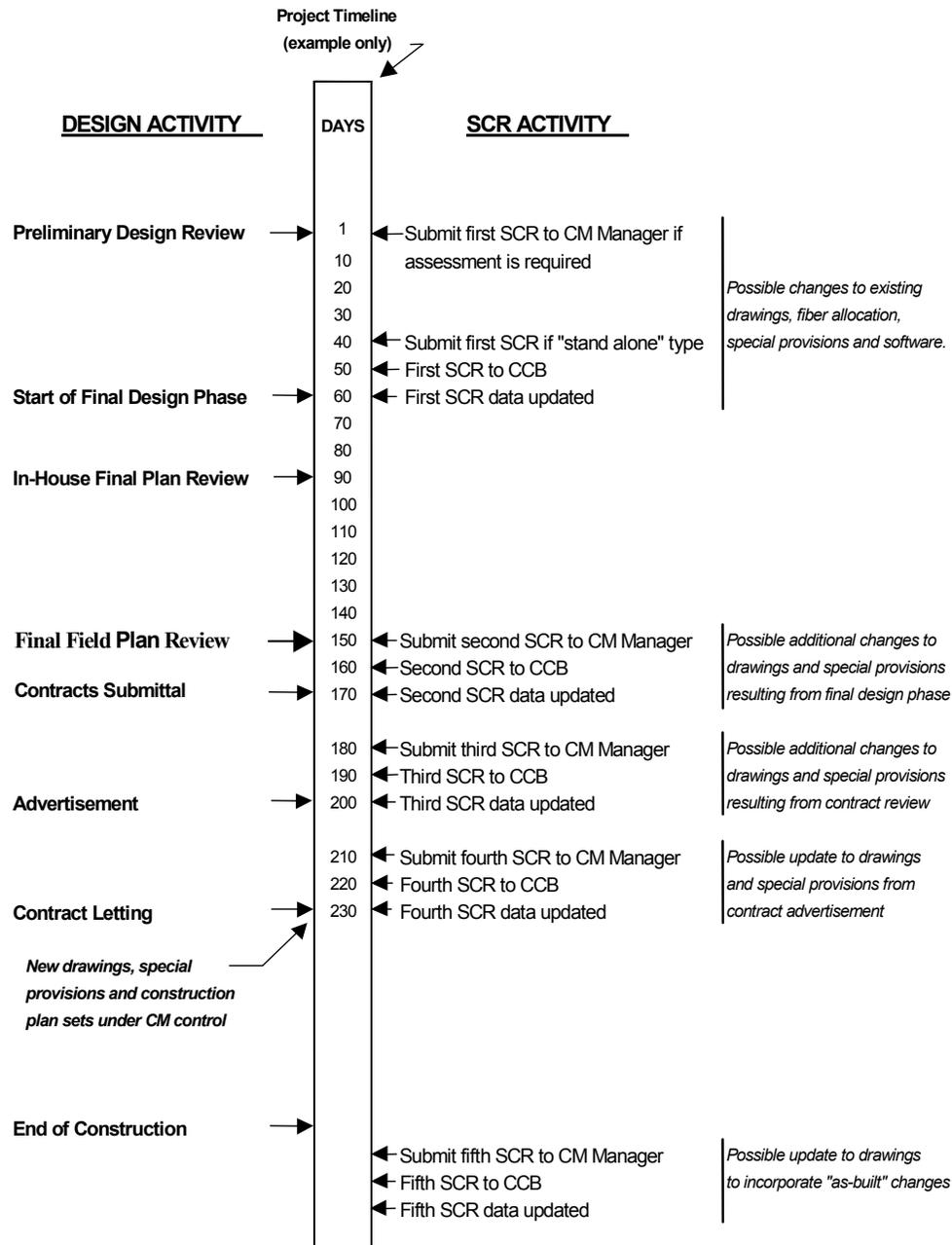


Figure 7.1: SCR Submittal Timeline

7.3.3.1 General

- a) Timing of the SCRs is critical. The first SCR should be submitted to the CM Manager as early as possible if CAR assessment is required. Care must also be taken in the submittal process to allow for CCB approval and CM data (drawings and documents) update.
- b) Projects will normally include a preliminary design phase and a final design phase. For projects that combine these phases, adjustments must be made in the SCR submittal timing to accommodate.
- c) If a change is made to an existing special provision, a review must be made to determine if changes should be made to project special provisions for other projects.

7.3.3.2 Specific

- a) The initial SCR should be submitted to the CM Manager just after the preliminary design review. This will formally begin the process and will be assigned to a CAR Leader for project assessment (if needed). If the project is small, and the SCR is a “stand alone” type, then submittal to the CM Manager may wait until approximately 20 working days prior to the start of the final design phase. Note: For a “stand alone” type SCR, care must be taken to be sure that all affected CM data has been accounted for and well defined on the SCR to avoid processing delays.
- b) The CAR Leader will solicit all personnel deemed necessary to provide total assessment for project requirements. The assessment will include any changes required to baseline information such as infrastructure drawings, fiber allocation drawings, special provisions and software. The CAR Leader will also help define any new documentation and drawings required by the project. Although these new drawings and documents are not subject to SCR control until baseline, they are still part of the project specification and subject to CM procedures.
- c) The CAR Leader must submit the SCR, with all recommended changes to baseline information and new documentation and drawing requirements, to the CM Manager. This should take place no less than 20 working days prior to the start of the final design phase.
- d) The CM Manager will submit the SCR to the CCB at least 10 working days prior to the final design phase to allow update of drawings in a timely manner.
- e) A second SCR may need to be submitted as a result of additional findings or requirements as a result of the final design phase efforts. The SCR may include additional update requirements to existing NaviGator infrastructure drawings, special provisions or final fiber assignments.
- f) The second SCR would normally be a “stand alone” type which would normally be submitted at least 20 working days prior to contract submittal to allow CCB action and document/drawing update. If for some reason additional assessment is required by the CAR Leader, then submittal of the SCR must be adjusted to accommodate.
- g) A third SCR may be required to incorporate all changes found during contract review. Submittals of the SCR must take place early enough prior to advertisement to allow for a CCB meeting and data update.
- h) A fourth SCR will be required to incorporate all changes to drawings, special provisions and project special provisions made during the contract advertisement phase. Because of the quick turnaround for changes during this period, an SCR will not be needed for each individual change. The Design Manager will designate someone to track and record all changes that occur to documents and drawings during the advertisement phase. All changes accumulated during this time will be submitted

on one SCR per document and/or drawing number. Again, the timing of the SCR must accommodate the CCB meeting and data update prior to contract letting.

- i) A final SCR should be submitted to incorporate “as-built” changes that may have occurred during the construction phase. If the contract has provided for delivery of as-built changes, a Q/A check process must occur on all documents and drawings to validate changes prior to SCR submittal.

Note: Additional SCRs may be submitted during the construction phase. SCRs determined by the originator or CAR Leader to be critical to construction efforts and/or current design issues, will be processed through the CCB and documents and plans updated immediately. Other SCRs of a non-critical nature may accumulate for update after CCB approval.

8. APPENDIX A – ACRONYMS AND DEFINITIONS

8.1 Acronyms

CAR	Change Assessment and Resolution
CCB	Configuration Control Board
CM	Configuration Management
COTS	Commercial Off-The-Shelf
CSAR	Configuration Status Accounting Report
CSCI	Computer Software Configuration Item
DM	Data Management
GDOT	Georgia Department of Transportation
H/W	Hardware
Q/A	Quality Assurance
S/W	Software
SCR	System Change Request
SDF	Software Development Folder
SRDD	Software Revision Description Document
TCC	Transportation Control Center
TMC	Traffic Management Center

8.2 Definitions

The definitions listed below establish the meaning in the context of this document.

Advertisement: The letting of contract information out to contractors for review and bidding process.

Approval: The agreement that an item is complete and suitable for its intended use.

Archived Data: Released or approved data that is to be retained for historical purposes.

Attributes: Performance, functional and physical characteristics of a product.

Assembly: A number of parts, or subassemblies or any combination thereof, joined together to perform a specific function.

Audit: An independent examination of a work product or a set of work products to access compliance with specifications, procedures, standards or other criteria.

Baseline: (1) An agreed-to description of the attributes of a product, at a point of time, which serves as a basis for defining change. (2) An approved and released document, or a set of documents, each with a specific revision; the purpose of which is to provide a defined basis for managing change.

Build: An operational version of a system or component that incorporates a specified subset of the capabilities that the final product will provide.

Computer software configuration item (CSCI): A configuration item for computer software.

Configuration: The function and/or physical characteristics of hardware, firmware, software or a combination thereof as set forth in technical documentation and archived in a product.

Configuration Control: The systematic proposal, justification, evaluation, coordination, approval or disapproval of proposed changes and the implementation of all approved changes in the configuration of a CI after formal establishment of a baseline.

Configuration Control Board (CCB): A board composed of technical and administrative representatives who recommend approval or disapproval of proposed changes to baseline information.

Configuration Item (CI): A collection of software and/or hardware that performs an end use function.

Configuration Management (CM): A management process for establishing and maintaining consistency of a product's performance, functional and physical attributes with its requirements, design and operational information throughout its life.

Design Review: A formal, documented, comprehensive, and systematic examination of a design to evaluate the design requirements and the capability of the design to meet these requirements and to identify problems and propose solutions.

Disapproval: Conclusion by appropriate authority that an item submitted for approval is either incomplete or not suitable for intended use.

Firmware: The combination of a hardware device and computer instructions or computer data that reside as read-only software on the hardware device. The software cannot be readily modified under program management.

Function: The action or actions that a product is designed to perform.

Hardware: Items made of material and their components (mechanical, electrical, electronic, hydraulic, pneumatic). Computer software and technical documentation are excluded.

Original: The current design activity's document or digital document representation and associated source data file(s) of record.

Physical attributes: Quantitative and qualitative expressions of material features, such as composition, dimensions, form, fit and their respective tolerances.

Product: Anything that is used or produced to satisfy a need, for example, facilities, systems, hardware, firmware, data, processes, materials or services.

Project Special Provisions: Special Provisions that have been modified for specific projects.

Release: An action whereby configuration documentation or an item is officially made available for its intended use.

Revision: Any change made to a document or drawing which requires the revision level to be advanced.

Requirements: Specified essential attributes.

Software: A combination of associated computer instructions and computer data definitions required to enable the computer hardware to perform computational or control functions.

Software Change Description Document (SCDD): A document which describes changes from one software release to the next.

Special Provisions: Base specifications used on all projects.

Specification: A document that explicitly states essential technical attributes/requirements for a product and procedures to determine that the product's performance meets its requirements/attributes.

Standard: A document that establishes engineering and technical requirements for items, equipment, processes, procedures, practices, and methods that have been adopted as a standard.

System Change Request (SCR): A form used to request a change to a baseline item.

9. APPENDIX B – FORMS AND EXAMPLES

9.1 General

The forms and examples in the following appendix are included as a reference guide and not intended to be used for copying and using for actual documentation. All forms are under CM control and are available through the CM Manager.

System Change Request (SCR)	NAV03-001
Software Change Description Document (SCDD)	NAV03-002
Document Title/Revision Form	NAV03-003
Drawing Format, Sheet 1- A size	NAV03-004
Drawing Format, Continuation- A size	NAV03-005
Drawing Format, Sheet 1- B size	NAV03-006
Drawing Format, Continuation- B size	NAV03-007
Drawing Format, Sheet1- D size	NAV03-008
Drawing Format, Continuation- D size	NAV03-009

9.2 System Change Request (SCR) Form

The SCR form is used to request, investigate, and approve or reject a change to baselined NaviGator data.

NaviGator- System Change Request (SCR)						22. SCR NO.
						23. PARENT NO.
1. ORIGINATOR:		2. SECTION:		3. DATE:		24. SCR HISTORY A LOG DATE: B READY CCB: C CCB DATE: D CLOSE DATE E CM MGR:
4. SUBJECT:						
5. TYPE OF CHANGE:		6. REASON FOR CHG:		7. AFFECTS:		
A <input type="checkbox"/> STAND ALONE B <input type="checkbox"/> ASSESSMENT <input type="checkbox"/> REQUIRED		A <input type="checkbox"/> DEFECT/ERROR B <input type="checkbox"/> IMPROVEMENT C <input type="checkbox"/> ADDITION		A <input type="checkbox"/> SOFTWARE B <input type="checkbox"/> HARDWARE C <input type="checkbox"/> DOCUMENT(S)		
				8. PRIORITY: A <input type="checkbox"/> EMERGENCY B <input type="checkbox"/> URGENT C <input type="checkbox"/> ROUTINE		
ORIGINATOR / CAR LEADER	9. DESCRIPTION OF CONDITION: A <input type="checkbox"/> ADDITIONAL DATA ATTACHED					
	10. RECOMMENDED SOLUTION: A <input type="checkbox"/> SUPPORTING DATA ATTACHED					
	11. CAR TEAM CONSULTED:					
12. DOC/DWG/SW NO. AFFECTED:						
13. CAR LEADER:		14. DUE DATE:		15. CCB MTG:		19. APPROVAL A <input type="checkbox"/> PRE APPROVED B <input type="checkbox"/> APPROVED C <input type="checkbox"/> REJECTED
16. NAME		17. ASSIGNMENT		18. DUE DATE		
CM MANAGER	20. NOTES:					
	21. DATA UPDATE ASSIGNMENTS					
	A. DOC/DWG/SOFTWARE NO.	B. OLD REV/VER	C. NEW REV/VER	D. DATA UPDATE BY	E. DATA Q/A BY	F. DUE DATE

FORM NO. NAV03-001

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9.2.1 SCR Form Completion Instructions

System Change Report (SCR) Instructions

*Originator and CAR Leader will complete all the non-shaded areas
(Fields 7,8,10,11 and 12 may be left blank by the originator if not known. CAR Leader must complete or validate these fields.)*

REFER TO CM MANUAL FOR MORE DETAILED INFORMATION ON EACH ITEM.

1. **ORIGINATOR:** Name of the person originating the SCR.
2. **SECTION:** Name of the section in which the originator works.
3. **DATE:** Enter the date the SCR is prepared.
4. **SUBJECT:** An appropriate subject title depicting the requested change.
5. **TYPE:** Check the type of SCR.
 - a) **STAND ALONE** - SCR is completely defined on its own. No CAR assessment required. Normally a simple change.
 - b) **ASSESSMENT REQUIRED** - CAR Team must assess total impact of SCR on all areas.
6. **REASON FOR CHANGE:** Check appropriate box.
 - a) **DEFECT/ERROR** - A defect or error to the original baseline item or past revision/version.
 - b) **IMPROVEMENT** - Improvements to existing hardware, software, etc.
 - c) **ADDITION** - Change to existing CM data due to additional new requirements.
7. **AFFECTS:** Check one or more that applies.
 - a) **SOFTWARE** - A change affecting software.
 - b) **HARDWARE** - A change affecting hardware including cabling as depicted on drawings.
 - c) **DOCUMENT(S)** - A change affecting documentation.
8. **PRIORITY:** Check appropriate box.
 - a) **EMERGENCY** - Normally requiring immediate action prior to CCB meeting.
 - b) **URGENT** - Important but can normally wait until next CCB. Request may be acted upon quickly and perhaps as a priority item.
 - c) **ROUTINE** - Normally can wait to be implemented to best fit schedule.
9. **DESCRIPTION OF CONDITION:** Enter paragraph describing current condition.
 - a) **ADDITIONAL DATA ATTACHED** - Attach additional information if needed.
10. **RECOMMENDED SOLUTION:** Enter paragraph for recommended solution to problem.
 - a) **SUPPORTING DATA ATTACHED** - Attach supporting data if needed.
11. **CAR TEAM CONSULTED:** Name of personnel that validated the resolution on the SCR.
12. **DOC/DWG/SW NO. AFFECTED:** Enter number and revision/version (if known) for each hardware and/or software item.
13. **CAR LEADER:** The name of the person responsible for SCR assessment.
14. **DUE DATE:** Date in which the SCR assessment is complete by the CAR Leader and is ready for CCB.
15. **CCB MTG:** The date of the CCB meeting.
16. **NAME:** Name of person(s) assigned by the CCB to obtain additional information for next CCB meeting prior to approval.
17. **ASSIGNMENT:** A brief explanation of the individual(s) task assignment.
18. **DUE DATE:** The date set by the CM Manager to have the assignment complete.
19. **APPROVAL:** Check appropriate box.
 - a) **PRE APPROVED** - CCB has given tentative approval based on future submittal of additional information.
 - b) **APPROVED** - CCB approves SCR and authorizes changes to be made in existing CM controlled data.
 - c) **REJECTED** - CCB has determined that proposed change is not valid.
20. **NOTES:** Any pertinent information as a result of the CCB meeting.
21. **DATA UPDATE ASSIGNMENTS:**
 - a) **DOC/DWG/SOFTWARE NO.** - The number of the document, drawing or software item to be updated.
 - b) **OLD REV/VER** - For documents and drawings, the letter of the current revision. For software, the current version number.
 - c) **NEW REV/VER** - For documents and drawings, the next letter higher than the previous one. For software, the version assigned by the CCB.
 - d) **DATA UPDATE BY** - The name of the individual responsible for the update of CM controlled data.
 - e) **DATA Q/A BY** - The name of the individual responsible for the integrity of the updated data.
 - f) **DUE DATE** - The date that all data is due back into the CM Repository.
22. **SCR NO.:** The SCR tracking number.
23. **PARENT NO.:** For an SCR that has been split, the number of the original (parent) SCR is entered.
24. **SCR HISTORY:**
 - a) **LOG DATE** - The date that the SCR was received and entered into the status log.
 - b) **READY CCB** - The date that the SCR is ready for the CCB.
 - c) **CCB DATE** - The date of the approved or rejected SCR by the CCB.
 - d) **CLOSE DATE** - The date that all work is complete, validated and returned to the repository.
 - e) **CM MANAGER** - The name of the individual that tracked and validated the SCR and all related information.
25. **SH 1 OF:** Add total amount of sheets if attachments are included.

FORM NO. NAV03-001

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9.2.2 SCR Form Example

NaviGator- System Change Request (SCR)						22. SCR NO. 94
						23. PARENT NO.
1. ORIGINATOR: Jim Operations		2. SECTION: Operations		3. DATE: 8/6/02		24. SCR HISTORY A LOG DATE: 8/7/02 B READY CCB: 8/21/02 C CCB DATE: 8/23/02 D CLOSE DATE: 10/3/02 E CM MGR: H. Cmguy
4. SUBJECT: Invalid events in hub monitor						
5. TYPE OF CHANGE: A <input type="checkbox"/> STAND ALONE B <input checked="" type="checkbox"/> ASSESSMENT REQUIRED		6. REASON FOR CHG: A <input checked="" type="checkbox"/> DEFECT/ERROR B <input type="checkbox"/> IMPROVEMENT C <input type="checkbox"/> ADDITION		7. AFFECTS: A <input checked="" type="checkbox"/> SOFTWARE B <input type="checkbox"/> HARDWARE C <input type="checkbox"/> DOCUMENT(S)		8. PRIORITY: A <input type="checkbox"/> EMERGENCY B <input type="checkbox"/> URGENT C <input checked="" type="checkbox"/> ROUTINE
9. DESCRIPTION OF CONDITION: A <input type="checkbox"/> ADDITIONAL DATA ATTACHED The HUBS_Server improperly sends sensor state updates when a communication failure is repaired. This results in bogus "Door Closed", "Smoke Cleared", and "Low Temp. Cleared" events.						ORIGINATOR / CAR LEADER
10. RECOMMENDED SOLUTION: A <input type="checkbox"/> SUPPORTING DATA ATTACHED Recommend having the HUBS_Server set the current state variable to the DefaultState value when comm. Is restored before checking for active sensors. Estimate less than 15 minutes of coding effort.						
11. CAR TEAM CONSULTED:		T. Nowseverything, S. Softexpert				
12. DOC/DWG/SW NO. AFFECTED:		NAV04-001				
13. CAR LEADER: Paul Software		14. DUE DATE:		15. CCB MTG:		19. APPROVAL A <input type="checkbox"/> PRE APPROVED B <input checked="" type="checkbox"/> APPROVED C <input type="checkbox"/> REJECTED
16. NAME		17. ASSIGNMENT		18. DUE DATE		
20. NOTES:						CM MANAGER
21. DATA UPDATE ASSIGNMENTS						
A. DOC/DWG/SOFTWARE NO.	B. OLD REV/VER	C. NEW REV/VER	D. DATA UPDATE BY	E. DATA Q/A BY	F. DUE DATE	
NAV04-001	V1.0.3	V1.0.4	Hal Programmer	Paul Software	9/28/02	

FORM NO. NAV03-001

REV. 2.0 DATE: 8/7/2002

SH 1 OF

9.3 Software Change Description Document (SCDD) Form

The SCDD form is used to identify the changes of the software version being released including bug fixes and new enhancements.

NAVIGATOR Software Change Description Document(SCDD)	
1. Software No. and version:	2. NAV No.:
3. Prepared By:	4. Date:
5. Description:	
6. Summary of Enhancements (include SCR numbers at beginning)	
7. Summary of Defect fixes (include SCR numbers at beginning)	
8. Notes / Comments:	
9. S/W Manager:	10. Date:
11. QA review by:	12. Date:
FORM NO. NAV03-002 REV. A DATE: 11/6/00	

9.3.1 SCDD Form Example

NAVIGATOR Software ChangeDescription Document(SCDD)	
1. Software No. and version: NAV04-001 version 1.0.1	2. NAV No.: NAV01-062
3. Prepared By: Jake Preparer	4. Date: 6/04/00
5. Description: Summary of enhancements and bug fixes for version 1.0.1 of Navigator software.	
6. Summary of Enhancements (include SCR numbers at beginning) SCR12- Preset files generated by VIDS_Server are now stored in /var/log/navigator rather than \$NAVIGATOR/etc SCR16- Added entry to the SES_AccessFunctions table load script for the "Terminal" item on ATMS_MainMenu. SCR23- Added "atms" to the SES_Group SCR24- Reduced the verbose logging in ATMS_MainMenu and VIDS_Control SCR 31- Updated GISC_Control to handle the logic reversal in SESS_AccessControl SCR36- Zeroed out unused bits in the Dimming Status parameter of the DSI communications protocol.	
7. Summary of Defect fixes (include SCR numbers at beginning) SCR09- Fixed RSPM problem that resulted in bad log dates. SCR18- Fixed INDM problem that resulted in bad dates and user id's in logs. SCR26- Added SSTV to the "navctl check all" output. SCR46- Fixed CMDA_UnitControl problem when displaying 2 phase messages where second phase is not displayed if off time is not zero. SCR83- Prevent incident closure form from popping down if scheduled or actual times and dated are invalid allowing the error to be corrected.	
8. Notes / Comments : SCR28 which was scheduled for this release is not included. CCB authorized this fix for version 1.0.4	
9. S/W Manager: Paul Manager	10. Date: 6/10/00
11. QA review by: Harvy Quality	12. Date: 6/11/00
FORM NO. NAV03-002 REV. A DATE: 11/6/00	

9.4 Document Title/Revision Form

The Document Title/Revision Form is used for all NaviGator internal use documents.

9.4.1 Document Title/Revision Form (Cover Sheet)

TRANSCORE

Georgia Department of Transportation
NaviGator

Title

Prepared for:
Georgia Department of Transportation
935 East Confederate Avenue, Building 24
Atlanta, Georgia 30316

Prepared by:
TransCore ITS, Inc.
3500 Parkway Lane, Suite 600
Norcross, Georgia 30092-2832

Date: **Month Day, Year**

Revision: **x**

Document No.: **NAVxx-xxx**

9.4.2 Document Title/Revision Form (Revision Sheet)



REVISION HISTORY					
DATE	REV.	BY	SCR	SECTION	DESCRIPTION

GDOT NaviGator
Report Title

i

DATE
NAVxx-xxx – Rev. x

9.5 Drawing Format Forms

The drawing format forms are to be used for all NaviGator hardware drawing creation.

9.5.1 Drawing Format Sheet 1 (A size 8.5 in. by 11.0 in.)

REVISION HISTORY				
REV.#	SCR.	DESCRIPTION	DATE	APPROVED

PROJECT No. <hr/> DRAWN BY: <hr/> CHECKED BY: <hr/> LOGG: <hr/>	GEORGIA DEPARTMENT OF TRANSPORTATION
TITLE <hr/>	
SIZE: <div style="text-align: center; font-size: 2em;">A</div>	DWG No.: <hr/>
SCALE: <hr/>	REV: <hr/>
SHEET: <hr/>	

NAV03-004 REV 1.0

9.5.4 Drawing Format Sheet 1 and Continuation (D size 22.0 in. by 34.0 in.)

REVISION HISTORY																	
Drawing area	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; font-size: x-small;">PROJECT</td> <td style="width: 30%;"></td> <td style="width: 20%; font-size: x-small;">DATE</td> <td style="width: 30%;"></td> </tr> <tr> <td style="font-size: x-small;">DRAWN BY</td> <td></td> <td style="font-size: x-small;">CHECKED BY</td> <td></td> </tr> <tr> <td style="font-size: x-small;">SCALE</td> <td></td> <td style="font-size: x-small;">APPROVED BY</td> <td></td> </tr> <tr> <td colspan="4" style="text-align: center; font-weight: bold; font-size: small;">GEORGIA DEPARTMENT OF TRANSPORTATION</td> </tr> </table>	PROJECT		DATE		DRAWN BY		CHECKED BY		SCALE		APPROVED BY		GEORGIA DEPARTMENT OF TRANSPORTATION			
PROJECT		DATE															
DRAWN BY		CHECKED BY															
SCALE		APPROVED BY															
GEORGIA DEPARTMENT OF TRANSPORTATION																	

REVISION HISTORY													
Drawing area	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; font-size: x-small;">PROJECT</td> <td style="width: 30%;"></td> <td style="width: 20%; font-size: x-small;">DATE</td> <td style="width: 30%;"></td> </tr> <tr> <td style="font-size: x-small;">DRAWN BY</td> <td></td> <td style="font-size: x-small;">CHECKED BY</td> <td></td> </tr> <tr> <td style="font-size: x-small;">SCALE</td> <td></td> <td style="font-size: x-small;">APPROVED BY</td> <td></td> </tr> </table>	PROJECT		DATE		DRAWN BY		CHECKED BY		SCALE		APPROVED BY	
PROJECT		DATE											
DRAWN BY		CHECKED BY											
SCALE		APPROVED BY											