**VY03-G07 -**

**Car Rental**

**Software Configuration Management Plan**

**Version: 1**

**Date: 6/4/2022**

**Product Development Lead: [Product Development Lead]**

PLAN UPDATE HISTORY

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Version** | **Date** | **Brief Description and Reason for Change** | **Affected Pages** | **Author** |
| 1 | ***6/4/2022*** | Initial release | - | ***Diệp Đức Tân*** |
|  |  |  |  |  |

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# ROLES AND RESPONSIBILITIES

## Project Organization

[Agile model ]

## Project Stakeholders (Roles) and Responsibilities

|  |  |
| --- | --- |
| **Stakeholders (Roles)** | **Responsibility** |
| **Scrum Master** | Responsible for the implementation of the CM and DM process for their project areas and performs CM/DM activities in accordance with standard processes and procedures as defined for [[project name]] in this CM Plan. May submit Change Requests (CRs). |
| Scrum Member (Dev, Tester, Product Owner) | Responsible for ensuring that the CM processes and work products are performed according to this CM Plan and the documented CM processes and procedures. |
| DevOps | Responsible for coordinating and implementing CM for the [car rental] project, identifying and controlling configuration items (CIs), establishing baselines upon which a CI is placed under CM control, providing reports as defined in this CM Plan, and providing adequate resources, including tools to support CM activities for the [[project name]] project.  Ensures the establishment of the baselines for the CIs and approves changes to these CIs. |

## Boards

### Configuration Control Board

A CCB has been established to authorize changes to baselined documentation, hardware and software and for in-development products. The CCB is chaired by the PDL and the membership consists of the CMO and senior team members who provide broad interdisciplinary representation. CCB members are: Scrum Member*.* The PDL requests the participation of additional personnel as necessary depending on the CR under consideration.

The CCB supports the PDL and includes technical and administrative representatives who recommend approval or disapproval of proposed engineering changes to a CI's current approved configuration and its documentation. The board also recommends approval or disapproval of proposed deviations from a CI's current approved configuration and its documentation.

**Guidance**

If the CCB meets regularly, state how often (this may vary according to the phase of the project). If it does not meet regularly, use the text below.

CCB meetings are called as necessary by the Chair depending on the quantity of Open CRs. The CCB will meet at least quarterly.

The Configuration Management Officer (*CMO)* serves as coordinator and scribe to the board and provides status accounting reports to the CCB and updates the status accounting information to reflect CCB decisions.

**Guidance**

Modify the figure below with to highlight your projects CCB, and any subsidiary team CCB(s) under your project’s control. Use appropriate nomenclature and indicate the Chair’s name(s).

Mission Project Level CCB

Sub-System Level CCB

Sub-System Level CCB

Sub-System Level CCB

Local CCB

Local CCB

Local CCB

Figure 2-1. ***Mission Project name*** Configuration Boards

### CCB Responsibilities

The CCB has authority for managing the project's product through the performance of the functions listed below:

1. Authorize establishment of configuration baselines and identification of CIs.
2. Represent interests of project management and all groups who may be affected by changes to the baselines.
3. Assign, review, and provide for disposition of action items.
4. Serve as a source for the coordination of technical expertise for the project.
5. Determine or review the availability of resources required to complete the proposed change or modification, assess the impact of the proposed change upon the system, examine cost considerations, and determine the impact of the change on development and test schedules.
6. Analyze change request impact, benefit and necessity.
7. Approve changes – or disapprove – as appropriate.
8. Monitor the status of open change requests

# RESOURCES AND ENVIRONMENTS

## Personnel

The CM effort for this project is ***person-year effort or indicate the amount of effort if it is less than 100% for a single person- ensure the effort agrees with the project Work Breakdown Structure.***

Personnel involved in CM activities will be familiar with and apply the standards and guidelines referenced in Section 1, are familiar with the CM Process, and the chosen CM tools. Required training is listed in the training matrix in the SMP/PP.

#### Guidance:

#### For Classes of Software other than A, B, and C the required training for the CM personnel should be listed here.

## Plans, Schedule, and Resources

The CM schedule is closely coordinated with the product schedule. CM audits will be performed at the conclusion of each new phase of development to verify that the CM procedures are correctly implemented as defined in this document. CM audits are scheduled in the project schedule.

The estimated CM budget for this project is documented in the annual budget identified in the SMP/PP***.*** The PDL will periodically review actual budget expenditures against planned expenditures and resolve any issues.

The CMO coordinates with the PM to ensure that CM activities are conducted in concert with the appropriate project activities and maintained in the project schedule.

## Repository

The [Car Rental] Repository structure is shown in Figure 3-1 with each of its main sub-folder elements described.

#### Guidance:

#### An example of a directory structure is provided in this template. If this example is followed it should be placed on a shared server. If a tool, or web-based solution is chosen, describe it and provide a screen-shot of its organization and/or layout.

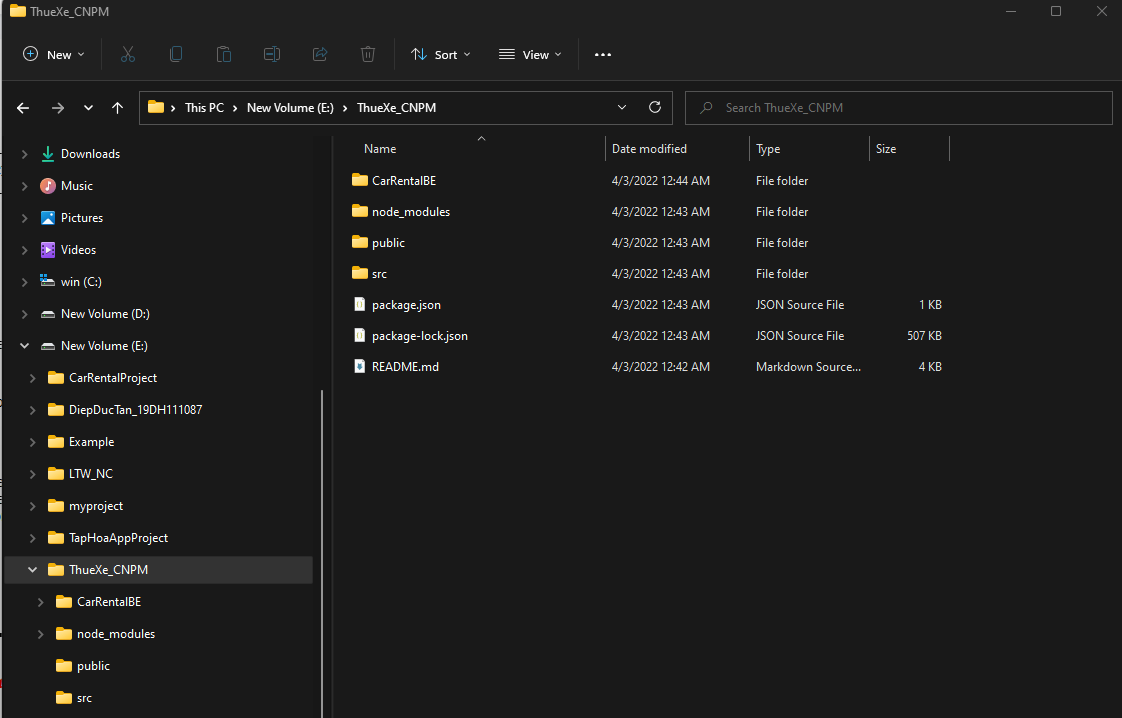


Figure 3-1. [Car Rental Project] repository structure

Software baselines are maintained in the CM support tool described in the next section.

## Support Tools

#### Guidance

The tools may be manual (consisting of controlled ledgers, notebooks, spreadsheets, or similar items) or automated (comprising a computerized database or similar set of tools and capabilities) or be a combination of the two.

Multiple tools may be used to manage code, requirements, design, code, change requests, documentation, etc. List all that are need for CM and change control (for both documents and software).

*The detailed description of how to use the CM system may be separately documented as individual CM procedures and should be referenced (e.g., procedures for storage and retrieval of CIs, archiving and retrieving CM records, creating CM reports).*

The configuration management support tool used on the [Car Rental Project] project is [SourceSafe, VCS, Rational….] for source code and [Rational, Docushare, website…] for CCB controlled documents.

The data management support tool for the project is [ClearCase, or repository, web-site….].

# ACTIVITIES AND APPROACH

## CM Phasing and Milestones

***Guidance***

*The author may choose to describe this section of the document using a combination of text and graphics, text only, or graphics only*. *This section should be tailored to describe CM activities within the system development life cycle phases covered by this version of the plan. The sample text in this section describes typical activities*.

The purpose of this section is to ensure that CM activity is appropriate to the scope and timing of the [[project name]] project activity.

Non software items will be version controlled by the author until the item is ready for signature and then will be placed under more formal control (if appropriate as identified in Attachment 1).

Software elements will be version controlled by the developer until the item’s unit test is completed and then placed under version control within the CM tool. Upon the completion of the development phase the item is placed under CCB control.

Table 4-1 identifies the planned baselined items, when they will be baselined, and when they will be considered for revision by milestone in relation to project activity for [[project name]]. Items marked with a “P” for the controlling organization are expected to be controlled by the Mission Projects CCB, otherwise it is controlled by the local CCB.

***Guidance***

*This list contains elements found through initial development and all phases of a project. For a project already in operations and maintenance, the phases may be the same for the incremental changes, and the baselines may be fewer.*

*Create* ***your*** *list of* ***planned*** *baselined Items, see below for* ***example****. A list of actual baselined items is maintained on a regular basis in the DML. Actual baselines are defined in Version Description Documents and revision histories (for documents).*

Table 4-1. Planned CM Baselines

***Guidance***

***All the baselined items and versions shown by phase are for example purposes only -- the contents of this table may look quite different.***

| Baselined Items |  | New Versions Planned by Phase | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Org. | Concept | Requirements | Design | Implementation | System Testing | Acceptance Testing | Operations |
| SMP/PP | P |  |  |  |  |  |  |  |
| Configuration Management Plan | P |  |  |  |  |  |  |  |
| Test Plan | P |  |  |  |  |  |  |  |
| Software Requirements Document | P |  |  |  |  |  |  |  |
| Simulator Design | P |  |  |  |  |  |  |  |
| Simulator models | P |  |  |  |  |  |  |  |
| Simulator Software | P |  |  |  |  |  |  |  |
| Telemetry definitions, command definitions (Project controlled from the beginning of the I&T phase) | P |  |  |  |  |  |  |  |
| Software source code files, command files |  |  |  |  |  |  |  |  |
| Build Generation Files (Make, Link, etc.) |  |  |  |  |  |  |  |  |
| Real-time O/S |  |  |  |  |  |  |  |  |
| Commands, Telemetry, Events, Tables |  |  |  |  |  |  |  |  |
| Development Tools (e.g., tools to build stored command loads, etc.) |  |  |  |  |  |  |  |  |
| Functional Design Documents |  |  |  |  |  |  |  |  |
| Detailed Design Documents |  |  |  |  |  |  |  |  |
| ICDs |  |  |  |  |  |  |  |  |
| Test Scenarios |  |  |  |  |  |  |  |  |
| Test Results |  |  |  |  |  |  |  |  |
| Software Version Description Documents |  |  |  |  |  |  |  |  |
| Unit Test Reports |  |  |  |  |  |  |  |  |
| Build Test Procedures |  |  |  |  |  |  |  |  |
| Build Test Reports |  |  |  |  |  |  |  |  |
| Systems Test data files |  |  |  |  |  |  |  |  |
| Build test verification matrices |  |  |  |  |  |  |  |  |
| Build test procedures |  |  |  |  |  |  |  |  |
| Build test reports |  |  |  |  |  |  |  |  |
| Test Procedures |  |  |  |  |  |  |  |  |
| Test Data Supplied by External Organizations |  |  |  |  |  |  |  |  |
| Software Acceptance Test procedures |  |  |  |  |  |  |  |  |
| Software Acceptance Test Report |  |  |  |  |  |  |  |  |
| Development Facility COTS Software |  |  |  |  |  |  |  |  |
| Software test tools |  |  |  |  |  |  |  |  |
| Test data files |  |  |  |  |  |  |  |  |

## Configuration Identification

### Identifying configuration items

For a complete list of all configuration items and data items for the [[project name]] project, see [[project name]] Data Management List (DML) (initial version Attachment 1). The updated [[project name]] project DML will be maintained in the “[name of your project’s CM library]” repository folder. ***[Update the location for your project]***

### Naming configuration items

The Naming Convention to be used on the [[project name]] project is: Base.ss.uu, where:

Base – Not more than 40 alphanumeric characters that define the software or system media and its content, document, or other work product

Suffix - ss.uu -- a period followed by 2 alphanumeric characters, another period and another 2 alphanumeric characters, which provide the revision / version of the software or system work product, for example:

* First two characters (ss) of the suffix define a major release or revision as defined by the project;
* Second two characters (uu) of the suffix define a minor release, update or revision as defined by the project.

***Guidance***

*Tailor this section with your project’s naming conventions.*

### Baseline Documentation

Version Description Documents (VDD’s or release documentation) document the contents of delivery baselines. These document the specific contents of baselines including versions of software elements and documentation.

# GLOSSARY / ACRONYMS

#### Guidance

Tailor the list appropriately

CCB – Configuration Control Board

CI – Configuration Item

CM – Configuration Management

CMO – Configuration Management Officer

COTS - Commercial Off-The Shelf

CR – Change Request

CRB – Change Review Board

DM – Data Management

DML – Data Management List

FCA – Functional Configuration Audit

IRB – Internal Review Board

PCA – Physical Configuration Audit

PAL – Process Asset Library

PDL – Product Development Lead

QA – Quality Assurance

QER - Quality Evaluation Report

RTM - Requirements Traceability Matrix

SPR – System Problem Report

VDD – Version Description Document

# Attachment #1 Data Management List

#### Guidance

Sample work products are included herein, update with a list of your project’s work products in the DML spreadsheet too.

The below is a snapshot from the latest excel version of the DML. Update the Sample DML in excel with your project’s work products and paste here (Paste Special, HTML Format seems to work best).

| **Title** | **Description / Notes** | **Created by/ Responsible for updates** | **Level of Control** | **Location  *[Project name]/Folder below OR Server OR URLs*** | **Primary Process Area** | **Frequency of update/creation** | **Current Version Number** | **Current Version Date** | **ITAR Sensitive?** | | **PPQA Evaluation Required?** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Data Management List (DML)** (this list) | This is important to Planning, Monitoring and Control and CM | PDL | Version | 02 Project Management | PP | As needed |  |  | N |  | |
| **CM/DM Plan** | See Product Plan section x.x ***(or this could be a separate plan)*** | CM Lead | CCB | 05 CM Materials | PP | Annual |  |  | Y | Yes | |
| **Project Plan** |  | PDL | CCB | 02 Project Management | PP | Annual |  |  | Y | Yes | |
| **Acquisition Management Plan** | See Product Plan section x.x ***(or this could be a separate plan)*** | PDL | CCB | 02 Project Management | PP | Annual |  |  | Y | Yes | |
| **Schedule** | Schedule, notes and inputs to schedule in the form of redlines/emails | PDL | Version | 02 Project Management | PP | Monthly |  |  | N |  | |
| **Estimates with Basis of Estimates** | Includes software and work product size estimates, effort estimates, staffing, schedule estimates and basis for all | PDL | Version | 02 Project Management | PP | As needed |  |  | N |  | |
| **Processes** | Includes process for both mgmt and technical work. See Product Plan section **x.x** for references. | ISD Division CCB | CCB | Goddard Process Asset Library: software.gsfc.nasa.gov | PP | As needed |  |  | N |  | |
| **Metrics Processes** | Project specific procedures for metrics collection, storage and analysis | PDL | CCB | 02 Project Management | PP | Annual |  |  | N |  | |
| **Project Training Plan and Log** | The log is updated as needed and the plan is reviewed for updated annually | PDL | Stored | 02 Project Management | PP | Annual |  |  | N |  | |
| **Monthly Cost Actuals** | Includes dollars and FTEs | PDL | Stored | 02 Project Management | PMC | Monthly |  |  | N |  | |
| **Meeting Minutes** | Includes all team meetings. Includes all status meetings with participants outside the project team. | Project Personnel | Stored | 05 Meeting Minutes | PMC | As needed |  |  | N |  | |
| **Meeting Log** | Includes agenda, attendees, and action items. | PDL | Stored | 02 Project Management | PMC | As needed |  |  | N |  | |
| **Project Training Material** | Project specific or project developed training only. | Project Personnel | Stored | EPG | PMC | Quarterly |  |  | N |  | |
| **Senior Staff Presentations** |  | Project Personnel | Stored | 02 Project Management | PMC | Quarterly |  |  | N |  | |
| **Status Information** | Includes any status information received from team members or other sources via email or other mechanism not otherwise described | PDL | Stored | 02 Project Management | PMC | As Provided |  |  | N |  | |
| **Senior Management Material (for Reviews)** |  | PDL | Stored | 02 Project Management | PMC | Monthly |  |  | N |  | |
| **Milestone Review Materials** | Presentation materials and any other support materials prepared for these milestone reviews: SRR, PDR, CDR, TRR, ATTR | PDL | Version | 02 Project Management | PMC | As generated |  |  | Y | Yes | |
| **Action Item List** |  | Project Personnel/ PDL | Stored | 02 Project Management | PMC | Monthly |  |  | N |  | |
| **Significant Correspondence** | Could include any emails or other information that might be of future use. | Project Personnel/ PDL | Stored | PDL and Team Member email account | PMC | As needed |  |  | N |  | |
| **Project Metrics Plan** | See Product Plan section x.x for description and specification of measurement objectives, particular measures to support these objectives and methods of analysis ***(or this could be a separate plan)*** | 110 | CCB | 02 Project Management | MA | Annual |  |  | N | Yes | |
| **Metrics Data** |  | Project Personnel | Stored | 03 Technical Work Products | MA | Monthly |  |  | N |  | |
| **Risks** |  | PDL | Version | 02 Project Management | RSKM | Monthly |  |  | Y |  | |
| **Risk Management Plan** | See Product Plan section x.x ***(or this could be a separate plan)*** | PDL | Version | 02 Project Management | RSKM | As needed |  |  | Y | Yes | |
| **Change Request (CR)** | Includes impact analysis. Analysis may take the form of a white paper if necessary | CM lead | Version | 08 Change Requests | CM | Annual |  |  | N |  | |
| **CCB Meeting Minutes** |  | CM Lead | Stored | 02 Project Management | CM | Monthly |  |  | N |  | |
| **Change Request Log** |  | CM Lead | Stored | 02 Project Management | CM | Monthly |  |  | N |  | |
| **Baselined Documents (List each separately)** |  | CM Lead | Version | CM Tool | CM | When baselined |  |  | Y | Yes | |
| **Baselined Software *(List each CSCI separately)*** | ***Add a line for each subsystem/box -- e.g. GNC and CDH. Don't add a line for each new build.*** | CM Lead | Version | CM Tool | CM | When baselined |  |  | Y | Yes | |
| CM Evaluation Reports/Audit Reports |  | CM Lead | Stored | 05 CM Materials | CM | Monthly |  |  | N |  | |
| **Quality Assurance Plan** | See Product Plan section x.x ***(or this could be a separate plan)*** | QA Lead | CCB | 07 QA Items | PPQA | Annual |  |  | N | Yes | |
| **QA Evaluation Reports** | Work product assessments and process assessments in the form of completed checklists, reports, and distribution emails | QA Lead | Stored | 07 QA Items | PPQA | Quarterly |  |  | N |  | |
| **QA Evaluation Corrective Action Log** |  | QA Lead | Stored | 07 QA Items | PPQA | Quarterly |  |  | N |  | |
| **Requirements Traceability Matrix** |  | Project Personnel | CCB | 02 Project Management | REQ | As needed |  |  | N | Yes | |
| **Requirements** |  | Project Personnel | Version | 01 Requirements | REQ | As needed |  |  | Y | Yes | |
| **Developed Software with Release Notes** | Includes source code files, command files, make files, link files. | Project Personnel | CCB | Baseline Snapshots-- 03 Technical Work Products  Version controlled through CM tool | D&I | As needed |  |  | N | Yes | |
| **System Problem Report (SPR)** |  | CM lead | Version | 08 Change Requests | D&I | Monthly |  |  | N |  | |
| Migration Plan |  | Project Personnel | Version | 03 Technical Work Products | D&I | As needed |  |  | N | Yes | |
| **System Design Documentation via PDR and CDR Packages** |  | Project Personnel | Version | 03 Technical Work Products | D&I | As needed |  |  | N | Yes | |
| **Architecture Diagram and definitions** | Includes trade studies | PDL | Version | 03 Technical Work Products | D&I | As needed |  |  | N |  | |
| Real-time O/S |  | DTL | Version | 03 Technical Work Products | D&I | As needed |  |  | N |  | |
| Simulators | Includes models, designs and software | DTL | Version | 03 Technical Work Products | D&I | As needed |  |  | N |  | |
| **System Documentation** |  | Project Personnel | Version | 03 Technical Work Products | D&I | As needed |  |  | N | Yes | |
| **Lab Records** | Includes lab configuration drawing, inventories, and calibration records | Lab Manager | Stored | 03 Technical Work Products | D&I | As needed |  |  | Y | Yes | |
| **Version Description Documents** |  | CM Lead | Version | 03 Technical Work Products | D&I | As needed |  |  | Y | Yes | |
| **Inspection Artifacts** | Announcements, materials and actions | DTL | Version | 03 Technical Work Products | V&V | As needed |  |  | N |  | |
| Use Cases |  | Project Personnel | CCB | 03 Technical Work Products | V&V | As needed |  |  | N |  | |
| **Test Cases / Test Scripts** |  | Project Personnel | Version | 03 Technical Work Products | V&V | As needed |  |  | Y |  | |
| **Test Plan** |  | Project Personnel | Version | 03 Technical Work Products | V&V | Annual |  |  | Y | Yes | |
| **Test Reports** | Includes detailed test results | Project Personnel | Version | 03 Technical Work Products | V&V | As needed |  |  | Y |  | |
| Purchase Requests | emails, requests for purchases, status of purchases and approvals if needed. | PDL | CCB | 02 Project Management | ACQ | As needed |  |  | Y |  | |
| Task Descriptions/ SOWs |  | PDL | Version | NASA TOMS System | ACQ | Annual |  |  | N | Yes | |
| Purchase receipt and acceptance records | Hardcopy documents | Lab Manager | Stored | Lab Manager Files | ACQ | Upon receipt and acceptance |  |  | N |  | |
| M533 and Q533 |  | PDL | Stored | Management | ACQ | Monthly |  |  | N |  | |
| Work Order Authorization Form (WOA) |  | PDL | Version | Control by Accounting | ACQ | Annual |  |  | N |  | |
| Make/Buy Decisions |  | PDL | Stored | 02 Project Management | ACQ | As needed |  |  | N |  | |