Class E Software Management Plan for Project X

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Contact Information:

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Approvals:

*Agency and Center policies do not establish a required set of approvers for a software management plan. In general, the SMP should be signed by representatives from each organization, for which the SMP represents a commitment or agreement. These may include, but are not limited to, project managers, branch heads, contractor management, the NASA Software Lead (see LPR 7150.2), software team leads, the Center Software Assurance Manager (see LPR 7150.2), software assurance personnel, software safety personnel, computer security officials, or chief engineers. Signature lines below are examples only.*

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**Revision History**

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| 1.0 | 8/31/2021 | Michael Madden | ALL | Initial Version |
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*Note 1: This template is provided as a Microsoft Word Document. However, a software management plan (SMP) can have any form and is best expressed in a form that integrates well with the team’s development environment. For example, the SMP can be a wiki page if the team uses a wiki to record other project information.*

*Note 2: Text in black is example text and should be replaced. Text in grey is guidance and can be removed from the final document.*

*Note 3: If a higher-level project plan covers the content outlined in this software management plan (SMP) template, then a separate SMP is not necessary.*

*Note 4: If the only software being developed on the project is by individuals for their own use, then the software development may qualify for the LPR 7150.2B exemption and no software management plan would be needed. To qualify, all of the following must be true: the software will not be run by other team members, the software will not be disseminated outside the team, the software is not a reportable item on the project, the software is not a deliverable, and the software is not intended for reuse on a future project. The Engineering Technical Authority approves exemptions for the project.*

# Overview

## Scope

This software management plan (SMP) describes the software management practices and activities of Project X. Project X will develop features A, B, and C to address the Level II milestone M of Program Q.

*The scope identifies the project and the software products and services within the scope of the project. The scope may also address the following topics: relationship of the software project to higher-level projects, the system context for the software products, a summarized concept of operation, relationship of the plan to other plans, and software products or services not within scope.*

## Products, Classification and Safety Criticality

Project X will develop the software products listed in Table 1. These products have an NPR 7150.2 classification of Class E and are not safety-critical per NASA-STD-8739.8. The Center Software Assurance Manager has confirmed the classification and provided Project X with a Software Assurance Classification Report (SACR) for the products listed.

Table Products and Product Classification

|  |  |  |
| --- | --- | --- |
| **Software Product** | **NPR 7150.2 Classification** | **NASA-STD-8739.8 Safety Criticality** |
| Product XYZ | Class E | No |

*Lists each of the software products or the systems and subsystems containing software that are within scope and identify the software classification and safety-critical determination of those products, systems, or subsystems.*

# Organization

*(Optional) Class E projects can include this section if needed to establish roles, responsibilities, and authority for software activities within the project or if it is important to identify stakeholders. Project organizational structure should show authority and responsibility of each organizational unit, including contractual suppliers and external organizations (e.g., universities, other government organizations, and industry partners).*

# Staffing

Table 2 lists the staff of Project X that will participate in software development activities described in this plan. The table shows the role and total time commitment of individuals on the project. Some staff have responsibilities other than software development and time spent on software development isn’t easily severable from their other duties. Therefore, time spent on software development activities may be a fraction of the time commitment shown.

Table Staffing

|  |  |  |
| --- | --- | --- |
| **Name** | **Role** | **Time Commitment** |
| John Doe | Principal Investigator | 0.50 FTE |
| Jane Smith | Researcher | 0.25 FTE |
| Jose Garcia | Developer | 0.50 FTE |

*Identify the individuals assigned to the project and their time commitment. For individuals performing other discipline work in addition to developing software, you can list their full commitment to the project and do not need to subdivide their time. If this information is detailed in another document, you can reference that document.*

# Schedule

Software development will cover a period from October 2020 to September 2021.

*Class E projects are not required to provide a formal schedule. However, if the project will be tracking progress against milestones, using releases and sprints (Agile), or scheduling tasks (e.g., Gantt chart), then this section should describe how the project is scheduling work and should reference the location of the working schedule.*

# Budget

*(Optional) Class E projects are not required to develop a detailed cost estimate for the software development. However, Class E projects should document any direct costs to the project for software development. These may include, but are not limited to, costs for new computing hardware, new software licenses, services (e.g., cloud computing), consulting, training, or travel. If these costs are captured in a higher-level plan, reference that plan.*

# Software Development PRocess

*NPR 7150.2 does not levy on Class E requirements for requirements management, software design, software construction, verification, validation, risk management, or configuration management. NPR 7150.2 also doesn’t levy on Class E most requirements for project management and supplier management. However, LPR 7150.2B does override NPR 7150.2 and levies software testing (SWE-066) on Class E.*

## Implementation Process

Example 1: Project X will write software in accordance with best practices of the ABC discipline.

Example 2: Project X will develop software using a Scrum-based agile process that leverages out-of-the-box workflows in Github Enterprise.

*Class E projects can put as little or as much detail as is necessary to assure successful design, construction and release of software that meets project and stakeholder needs. Any team agreements on development practices should be documented here.*

## Verification and Validation

Example 1: Project X relies on Scrum Reviews with stakeholders at the end of each two-week sprint to validate the software. Each Scrum Review will include a demonstration of new features and bug fixes completed during the sprint.

Example 2: Project X uses a test-first approach in which project and stakeholder needs are expressed as software tests before the software is written. The software is then executed against the tests; the software is complete when it passes the tests.

Example 3: When the software lead assigns a Jira user story from the product backlog to a team member during sprint planning, the team member adds one or more Jira tasks to the story describing the software test cases as part of refining the story’s definition of done. The story isn’t done until all the testing tasks are implemented and passed. The project performs nightly regression testing to make sure that new updates do not break prior features. The project uses Jenkins to automate execution of all tests completed to-date. Jenkins then performs nightly regression testing on the latest development release of the software. The project creates bug reports for any failures in regression testing and adds them to the product backlog. Unless otherwise agreed to by project management, software is not ready for release until all testing tasks are complete, and all bug reports are closed.

*LPR 7150.2B requires Class E projects to perform software testing. However, projects are free to define the type, amount, rigor, and documentation of the testing. Therefore, this section can simply describe the project’s testing approach.*

# Configuration and Data Management

## Configuration Management

*(Optional) NPR 7150.2 levies no configuration management requirements on Class E software. However, the project should consider describing how the project will manage software changes from multiple team members and how it will perform software releases.*

## Data Management

Table 3 lists the project’s software artifacts and identifies the location where the artifacts are stored. The project will only retain a compiled executable of the latest release approved for use. Previous releases can be re-built from the source code history in developer.nasa.gov.

Table Storage of Software Artifacts

|  |  |
| --- | --- |
| **Software Artifact** | **Storage Location** |
| Software Management Plan | \\org-server\projects\project\_x\software |
| Source Code | Github Enterprise on developer.nasa.gov under Project X. |
| Compiled executable | \\org-server\projects\project\_x\software\ latest\_release |

*(Optional) NPR 7150.2 contains no data management requirements. Nevertheless, it is a best practice to identify the project’s important software artifacts and document where the project stores them.*

# Intellectual Property Rights

Project X intends to release Product XYZ as NASA Open Source. Project X will utilize a task order on the IT Consolidated Services (ICS) contract to develop some features of Product XYZ. Project X will work with Procurement to add the appropriate data rights clauses to the task order that assign copyright of the source code written under the ICS task to NASA. Project X will follow the schedule below for the software release as NASA Open Source:

* Start a New Technology Report (invention.nasa.gov) for Product XYZ based on planned features at the conclusion of the planning workshop with stakeholders to be held in October 2020.
* Finalize and submit NTR when first release of Product XYZ is ready for demonstration to stakeholders. The goal is to have this first demonstration in March 2021.
* Submit a Software Release Request (softwarerelease.ndc.nasa.gov) for NASA Open Source release upon reception of the LAR number for Product XYZ. Expect LAR number by June 2021.
* Post Product XYZ to the NASA public Github (github.com/nasa) upon approval of software release request. Expect approval by December 2021.

*Identify the intellectual property rights that NASA requires for the software and, if applicable, plan the release of the software through the Software Release Authority. This item should address how NASA will obtain and retain necessary intellectual property rights for the life of the software when the software includes components not written by civil servants (including but not limited to software written by contractors, off-the-shelf software, open source software, and auto-generated software).*

# Cybersecurity

Project X will execute Product XYZ on org-server.ndc.nasa.gov which has an approved System Security Plan (SSP). Consultation with Computer Security Official Jack Jones resulted in the following action(s) for Project X:

* Product XYZ is anticipated to use third-party python libraries not currently installed on org-server.ndc.nasa.gov. Project X will submit a request to Langley IT Acquisition Management (ITAM, itam.larc.nasa.gov) for each new third party library that it will acquire. ITAM performs a supply chain review on all requested software.

No other information controls or mitigations to be implemented by Project X were identified. Specifically, it was determined that Product XYZ a) will not embed, read, process or write controlled unclassified information (CUI) including EAR/ITAR data, PII data, or LaRCNet data, b) will not implement access controls or other user authentication such as single sign on (SSO) login, c) will not perform communication with other systems inside or outside of LaRCNet, and d) will not run continuously (24/7) or as an on-demand service.

*Work with your organization’s Computer Security Official (CSO) or with the Center Chief Information Security Officer (CISO) to determine what actions, if any, Project X needs to take to establish or maintain the information security of NASA systems.*

# References

1. LPR 7150.2B LaRC Software Engineering Requirements
2. NASA-STD-8739.8 NASA Software Assurance and Safety Standard
3. NPR 2210.1C Release of NASA Software
4. NPR 7150.2C NASA Software Engineering Requirements

# Abbreviations

The following table of abbreviations apply to this Software Management Plan.

|  |  |
| --- | --- |
| **Abbreviation** | **Definition** |
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Table Table of Acronyms & Abbreviations