

NPR 7150.2D/LPR 7150.2B Compliance Matrix		Class: E		Project:				
Req #	Requirement Text	Technical Authority	Responsible Party	Applicability	Compliance	Tailoring Description	Tailoring Rationale	Compliance Guidance
SWE-033	The project manager shall assess options for software acquisition versus development.	EngTA	NASA Software Lead	X	FC			The NA marking cannot be used in the Compliance column.
SWE-013	The project manager shall develop, maintain, and execute software plans, including security plans, that cover the entire software life cycle and, as a minimum, address the requirements of this directive with approved tailoring.	EngTA		X				The NA marking cannot be used in the Compliance column. The project can use the FC marking if plans cover all life cycle phases funded under the project.
SWE-042	The project manager shall require the software developer(s) to provide NASA with electronic access to the source code developed for the project in a modifiable format.	EngTA		X				The NA marking cannot be used in the Compliance column. This guidance overrides LPR 7150.2B because NPR 7150.2C modified this requirement to apply to both in-house and contracted software development.
SWE-139	The project manager shall comply with the requirements in this NPR that are marked with an “X” in [NPR 7150.2] Appendix C consistent with their software classification.	LMS Waiver	Project Manager	X	FC			Do not change the compliance marker of FC. An LMS Waiver is required for relief from this requirement.
SWE-121	Where approved, the project manager shall document and reflect the tailored requirement in the plans or procedures controlling the development, acquisition, and deployment of the affected software.	EngTA		X				The NA marking cannot be used in the Compliance column.
SWE-125	Each project manager with software components shall maintain a requirements mapping matrix or multiple requirements mapping matrices against requirements in this NPR, including those delegated to other parties or accomplished by contract vehicles or Space Act Agreements.	LMS Waiver	NASA Software Lead	X	FC			Do not change the compliance marker of FC. An LMS Waiver is required for relief from this requirement.
SWE-020	The project manager shall classify each system and subsystem containing software in accordance with the highest applicable software classification definitions for Classes A, B, C, D, E, and F software in Appendix D.	LMS Waiver	NASA Software Lead	X	FC			Do not change the compliance marker of FC. An LMS Waiver is required for relief from this requirement.
SWE-176	The project manager shall maintain records of each software classification determination, each software Requirements Mapping Matrix, and the results of each software independent classification assessments for the life of the project.	LMS Waiver	Project Manager	X	FC			Do not change the compliance marker of FC. An LMS Waiver is required for relief from this requirement.
SWE-022	The project manager shall plan and implement software assurance, software safety, and IV&V (if required) per NASA-STD-8739.8, Software Assurance and Software Safety Standard.	EngTA and SMA TA		X				The NA marking cannot be used in the Compliance column.
SWE-205	The project manager, in conjunction with the SMA organization, shall determine if each software component is considered to be safety-critical per the criteria defined in NASA-STD-8739.8.	LMS Waiver	Project Manager	X	FC			Do not change the compliance marker of FC. An LMS Waiver is required for relief from this requirement.

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SWE-148	The project manager shall evaluate software for potential reuse by other projects across NASA and contribute reuse candidates to the appropriate NASA internal sharing and reuse software system. However, if the project manager is not a civil servant, then a civil servant will pre-approve all such software contributions; all software contributions should include, at a minimum, the following information: a. Software Title. b. Software Description. c. The Civil Servant Software Technical POC for the software product. d. The language or languages used to develop the software. e. Any third party code contained therein and the record of the requisite license or permission received from the third party permitting the Government’s use and any required markings (e.g., required copyright, author, applicable license notices within the software code, and the source of each third-party software component (e.g., software URL & license URL)), if applicable. f. Release notes.	EngTA		X				The NA marking cannot be used in the Compliance column. The FC compliance marking may still be used as long as the project makes an honest attempt to assess reusability, even if that assessment results in no candidates for reuse.
SWE-156	The project manager shall perform a software cybersecurity assessment on the software components per the Agency security policies and the project requirements, including risks posed by the use of COTS, GOTS, MOTS, OSS, or reused software components.	EngTA and CIO TA		X				The NA marking cannot be used in the Compliance column.

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**Signatories**

NASA Software Lead

Supervisor of NASA Software Lead

**Tailoring Approvals**

Engineering Technical Authority (EngTA)

SMA Technical Authority (SMA TA)

Center CIO Tailoring Authority (CIO TA)

**Software Assurance Review**

Center Software Assurance Manager

## NPR 7150.2D/LPR 7150.2B Requirements Mapping Matrix for Class E

### Introduction

Projects developing, acquiring, maintaining, or operating software are required to complete a requirements mapping matrix per NPR 7150.2D SWE-125.

### Roles and Responsibilities

The NASA Software Lead, as defined in LPR 7150.2B Section 2.1.2, is responsible for the content of the requirements mapping matrix and for obtaining signatures. However, the NASA Software Lead may rely on the software team (including contractors) to populate the template.

### File Naming

Before entering data, save this file using the name RMM\_<project\_name>.xlsx where <project\_name> is the name of the project or other unique description of the software activity.

### Matrix Columns

The requirements mapping matrix displays the following content in each column:

Req #	The requirements number given to the requirement by its source document. Numbers beginning with SWE are found in NPR 7150.2D; those beginning with LSWE are found in LPR 7150.2B. Do not modify this column.								
Requirements Text	The full text of the software engineering requirement taken from the source document. Do not modify this column.								
Technical Authority	<p>The level of technical authority that can approve the tailoring of each requirement. This column contains one of or more of the following entries:</p> <table><tr><td>LMS Waiver</td><td>This requirement cannot be tailored. To modify adherence to this requirement, the project manager must first submit an LMS Waiver. For some requirements, the modification must be approved by Headquarters.</td></tr><tr><td>EngTA</td><td>The Engineering Technical Authority for the project.</td></tr><tr><td>SMA TA</td><td>The Center's Safety &amp; Mission Assurance Technical Authority.</td></tr><tr><td>CIO TA</td><td>The Center's Chief Information Officer Tailoring Authority.</td></tr></table> <p>See LPR 7150.2D Section 3 for more information on tailoring. Do not modify this column.</p>	LMS Waiver	This requirement cannot be tailored. To modify adherence to this requirement, the project manager must first submit an LMS Waiver. For some requirements, the modification must be approved by Headquarters.	EngTA	The Engineering Technical Authority for the project.	SMA TA	The Center's Safety & Mission Assurance Technical Authority.	CIO TA	The Center's Chief Information Officer Tailoring Authority.
LMS Waiver	This requirement cannot be tailored. To modify adherence to this requirement, the project manager must first submit an LMS Waiver. For some requirements, the modification must be approved by Headquarters.								
EngTA	The Engineering Technical Authority for the project.								
SMA TA	The Center's Safety & Mission Assurance Technical Authority.								
CIO TA	The Center's Chief Information Officer Tailoring Authority.								
Responsible Party	Enter the name of the individual or organization responsible for addressing the requirement.								
Applicability	The applicability of the requirement to the software class as defined in the source document. An 'X' indicates fully applicable. Other markings are plain text. Do not modify this column.								
Compliance	Declare to what level the project will comply with the requirement. Selectable markings are 'FC' (full compliance), 'T' (tailored), and 'NA' (not applicable). See <i>Levels of Compliance</i> for an explanation of each marking. Also see the <i>Compliance Guidance</i> column for guidance and restrictions on compliance markings for a given requirements.								
Tailoring Description	If selecting 'T' for compliance, describe how the project is tailoring the requirement. If partially implementing the requirement, identify what portions of the requirement will be implemented. If replacing the requirement with an alternate practice, describe the alternate practice. If tailoring out the requirement, simply write 'tailor out' or similar language.								
Tailoring Rationale	<p>If selecting 'T' for compliance, provide an engineering justification for tailoring the requirement. The justification should identify how the tailoring impacts technical risk or opportunities. If the tailoring increases risk on the project, the justification should present mitigation for the added risk or argue for acceptance of the added risk.</p> <p>If selecting 'NA' for compliance, identify what applicability category of LPR 7150.2B Appendix D.2 does not apply. The Compliance Guidance column provides a quick reference for whether 'NA' is permitted and what applicability category(ies) restrict applicability of the requirement.</p>								

Compliance Guidance	This column provides guidance and restrictions on entries for the requirement in the <i>Compliance</i> column. For example, the 'NA' marking cannot be used for most requirements. The compliance entry in the Compliance column must adhere to the guidance in this column. Do not modify this column.
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#### Entering Data and Routing

1. Enter a name for the project in cell 'requirements mapping matrix!' (E1)
2. For each requirement,
  - a. Enter the individual or organization responsible for the requirement in column D
  - b. Use the drop down list in column F to select the level of compliance (see *Levels of Compliance*). This entry must conform to the guidance and restrictions in column I.
  - c. If the level of compliance is 'T' (tailor), describe the tailoring in column G and justify the tailoring in column H.
  - d. If the level of compliance is 'NA' (not applicable), identify the non-applicable restriction in column H.  
 Note: Only requirements in LPR 7150.2B Appendix D.2 can be marked 'NA' and only if the listed applicability restriction does not apply. For example, a project that is not developing safety-critical software can mark requirement SWE-023 as 'NA' in column F and enter 'not safety-critical' in column H.  
 Note: For requirements implemented directly in LPR 7150.2B, columns D and F are already populated in the template. Modifying these entries (except to increase specificity of responsible party) requires an LMS Waiver per LMS-CP-7151.
3. The NASA Software Lead and the Software Lead's Supervisor sign and date the requirements mapping matrix on rows 105 and 106.
4. If 'T' appears in column H for any requirement,
  - a. the Engineering Technical Authority for the project signs on row 109 to approve the tailoring for any requirement
  - b. the Center Safety & Mission Assurance Technical Authority signs on row 109 as determined by LPR 7150.2B section 3.2.2; this includes tailoring of any requirement whose entry in column C includes SMA TA.
  - c. the Center CIO Tailoring Authority signs on row 111 only if tailoring a requirement whose entry in column C includes CIO TA.  
 Note: If the software impacts human health and medical activities, then the Center Health and Medical Authority must also approve tailoring. Since this is rare, a signature line is not included in the template and must be added.  
 Note: Tailoring of SWE-032 or SWE-141 requires the Engineering Technical Authority to route the approval to Headquarters.
5. The NASA Software Lead submits the requirements mapping matrix to the Center Software Assurance Manager. The Center Software Assurance Manager signs on row 114 to concur that the matrix is correct and complete per NPR 7150.2D and LPR 7150.2B requirements and guidance.

#### Levels of Compliance

The project may select one of three compliance levels for each requirement. The compliance levels are defined below:

FC	Full Compliance - The responsible party plans to meet the requirement as stated.
T	Tailored - The responsible party plans to either a) partly meet the requirement as stated, b) use an alternative practice, or c) not address the requirement for a reason that does not qualify as an 'NA' designation.
NA	Not Applicable - The requirement does not apply to the project per LPR 7150.2B Appendix D.2. This designation does not require technical authority approval. However, this designation can only be used for requirements with restricted applicability per LPR 7150.2B Appendix D.2. The Compliance Guidance column provides a quick reference on whether NA can be used and the applicability category(ies) that restrict the requirement. To use NA, the project must not meet the applicability category(ies). Otherwise, the project can still use 'T' to tailor down or tailor out the requirement. For example, SWE-134 applies only to safety-critical software. If the project is not developing safety-critical software, the NASA Software Lead can enter 'NA' for compliance. However, if the project is developing safety-critical software but wants to tailor out the requirement, the NASA Software Lead must enter a 'T' for compliance.

#### Signatures

It is not required that projects have physical signatures for the requirements mapping matrix. Approvals and concurrences can be obtained via correspondence or meetings. However, such approvals or concurrences must be recorded in an electronic or paper record. Then, the NASA Software Lead can identify the record in the signature line and the date of the record on the date line for each signatory.

#### Printing The requirements mapping matrix

The printing area for the requirements mapping matrix tab is configured for legal size paper in a landscape orientation.

#### Reporting Issues with Workbook

Report any issue with this workbook to the LaRC Software Engineering Process Group (SEPG) via e-mail to [larc-dl-sepg@mail.nasa.gov](mailto:larc-dl-sepg@mail.nasa.gov).

Version	Date	Description
1.0	2/28/2020	Initial Version
1.1	3/30/2020	Fixed omissions in replacing 'compliance matrix' with 'requirements mapping matrix' and replaced any references to classes D or E with classes A, B, and C.
		Changed entries in Technical Authority column to clarify approval authority for tailoring and to provide traceability to the signatories section.
		Added Compliance Guidance column (I) to provide guidance and restrictions on filling out the Compliance column (F)
		Added a new Help section in the Instructions worksheet
		Added the 'safety-critical' as the Applicability (Column E) marking for SWE-184 and SWE-192
1.2	6/11/2020	Corrected misspellings in column I
1.3	12/10/2020	Corrected compliance guidance for SWE-206. Project can mark requirement as NA if there is no auto-generated software.
1.4	4/12/2022	Updated for NPR 7150.2D. Corrected spacing in Instructions sheet.
1.5	9/5/2023	Corrected title for Instruction Tab from 'Class D' to 'Class E'