GENERAL

This form is provided to promote the successful and consistent implementation of the computer program change requirements of Engineering Standards Manual (ESM) STD-342-100, *Chapter 21, Software (Chapter 21).*

These instructions are for completing the form and are not part of the completed form.

LANL personnel: Endeavor to use Chapter forms as-is and report issues and improvement ideas to the Chapter 21 POC. POC may authorize other methods equivalent to chapter forms in writing.

LANL subcontractors must use Chapter forms to satisfy Chapter requirements for SSC software. For Non-SSC software, subcontractors may either use their own forms or integrate, adapt, and reformat the forms; either approach is acceptable so long as key functions, data, and approvals are retained.

If entering sensitive information (e.g., Unclassified Controlled Nuclear Information -UCNI), ensure proper Derivative Classifier/Reviewing Official reviews are performed and appropriate markings applied.

This form does not apply to SSC Software. For SSC software, use AP-341-507, *SSC Software Control Software Change Package* or AP-341-519, *Design Revision Control (see Chapter 21 SOFT-GEN for discussion).*

Any person may request changes (Requestor). The Requester completes Section 1.0 and provides the form to the Software Owner (SO) who then further develops the software change request and engages the SRLM and as required, FDAR or DA for review and approvals as indicated on the form.

This form does not apply to Less Than Minor computer program changes as defined in Chapter 21. At time of writing, Chapter 21 (SOFT-GEN) defines these as:

Less Than Minor Computer Program Change. A change that is not a major or minor computer program change and:

- adds, deletes and/or modifies ML-4 performance function code,
- adds, deletes and/or modifies code that does not modify performance function (all MLs), or
- imparts changes without adding, deleting or modifying design and/or analysis output values (all MLs).

Examples: Install security patch/service pack updates. An OTS software patch that includes a code change to prevent a screen from “freezing” or loading slowly (all MLs). Add/modify code clarifying notes (all MLs). Modify code to produce multiple reporting formats (all MLs).

For less than minor computer program changes, ensure they are made by a competent individual knowledgeable in the software. If feasible, add a brief description, name of who is making, justification that the change does not modify performance functions (all MLs), and the date that the less than minor change is made in the computer program code at the time the change is made. *If it is not feasible to document the less than minor change in the code, then document in associated operational logbooks, etc.*

Final Actions: Upon completion of changes, the SRLM is responsible for:

(a) Incorporating changes into the software baseline as soon as practical after changes are approved, and

(b) retaining Non-SSC Software Change packages as a record in accordance with P1020-1, *Laboratory Records Management* or the governing records management process.

HEADER (COMPLETED BY REQUESTOR)

Field	Entry Information
Software Name	Enter the name of the software in the upper right-hand corner of the header (e.g., Non-SSC Software Change Package Form (SWNCP) *for Ceasar II Software)*.
SWNCP No.	Number this form in accordance with the governing document control procedure. For LANL owned Non-SSC software in the scope of the Facility Conduct of Engineering (FAC-COE), use the numbering scheme and process specified in AP-341-402, *Engineering Document Management in Operating Facilities*.
Rev.	Enter the SWNCP revision number. Enter "0" for initial revision and 1, 2, etc. for subsequent revisions.

1.0 SOFTWARE CHANGE REQUEST INFORMATION (COMPLETED BY REQUESTOR)

Field	Entry Information
1.1	Enter the software name and version to be changed. Use the version number before the change is implemented.
1.2	Enter the date the software change request was initiated.
1.3	Enter the target date that the requestor would like to have the software change completed.
1.4	Enter the name, Z number if applicable, and organization of the person requesting the change (Requestor). This should typically be the SO although others may also be Requestors. For assistance in determining the SO, see SOFT-GEN Appendix C: *SO and SRLM Decision Diagram for FAC-COE.*
1.5	Enter the name, Z number if applicable, and organization of the SO. If the Requestor is the SO, indicate "Same as 1.4" or similar text.
1.6	Enter a specific and succinct change request title. If desired, include the version before the change (e.g., "Correct POSTMAX Version 2.0 Test Comparison Executable to Run Test Case 7 Without Aborting").
1.7	Enter the LANL Technical Area (TA) number of the TA associated with the software change. If the software is used at various TAs, enter TA 99.
1.8	Enter the facility number(s) of the facility associated with the software change. Follow AP-341-402 conventions for utilities, multiple, etc. (e.g., i*f multiple, enter MULT…)*
1.9	Enter facility name(s) of the facility associated with the software change. If the software is used at various LANL facilities, enter "multiple".
1.10	Enter the type of reason for the change request. Check all that apply. **Defect**: 1. a problem which, if not corrected, could cause an application to either fail or to produce incorrect results. 2. an imperfection or deficiency in a project component where that

Field	Entry Information
	component does not meet its requirements or specifications and needs to be either repaired or replaced. (Ref. ISO/IEC/IEEE 24765:2010-12-15, Systems and Software Engineering – Vocabulary). **Requirement Change:** New and/or modified requirements.
1.11	Describe the reason (rationale) for the change request. Describe "why" the change is needed. Enter the Nonconformance Report (NCR) name and number or other problem/error report that may apply. Indicate what could happen if the change is not implemented. If known, provide a high-level description of the desired changes.

2.0 SOFTWARE CHANGE REQUEST DEVELOPMENT (COMPLETED BY SO)

Field	Entry Information
2.1	Enter the software identification number (SWID). The SWID should be the same SWID as on the Form 2033. Keep SWID the same through minor revisions, and most major revisions unless the major revision is so different that the SRLM wishes to obtain a new SWID. SWIDs are obtained in accordance with AP-341-402, *Engineering Document Management in Operating Facilities*.
2.2	Select the software designation (safety software, risk significant software (RS) or commercially controlled software (CC)) from the drop-down menu. Select only one designation.
2.3	Select the associated Management Level (ML- 1, 2, 3 or 4) from the drop-down menu. If used for multiple ML applications select the highest risk (lowest number), (e.g., for software used in ML-2 and ML-3 applications, enter ML-2.)
2.4	Indicate whether the change is a Major or Minor change by checking either the major or minor box. If Major and Minor changes are to be made, select major. Note that a change can include a change to the computer program (including data) or changes to documentation. Use Chapter 21 definitions. At the time of writing, Chapter 21 definitions are as follows**:** **Major Computer Program Change:** A change that: ▪ the Software Responsible Line Manager (SRLM) or computer program supplier designates as a major change, ▪ adds or deletes an ML-1, ML-2 or ML-3 SSC performance function, ▪ modifies ML-1 or ML-2 SSC performance function code, excluding clarifying notes, ▪ adds, deletes or modifies design and/or analysis output values of ML-1, ML-2 or ML-3 calculations, ▪ recodes to another language, or ▪ modifies a significant number of lines of code. ***Note:*** *A Major OTS computer program change is often indicated with increment increase in version number (e.g., change from version 1 to 2). An evaluation of the software however, is required to determine whether the version release is a major change.* Examples: A change in the algorithm or databased used for calculating the water flow rate

Field	Entry Information
	in an ML-3 fire protection piping system design. A change in coding language from C to C++. A version change where 40% of the lines of code were modified. **Minor Computer Program Change:** A change that is not a major computer program change and: ▪ adds or deletes an ML-4 SSC performance function, ▪ modifies ML-3 SSC performance function code, excluding clarifying notes, or ▪ adds, deletes or modifies design and/or analysis output values of ML-4 calculations ***Note:*** *A minor OTS software change is often indicated with a fractional increase in version number (e.g., 1.1 or 1.01). An evaluation of the software however, is required to determine whether the version release is a minor change.* Example: Change the algorithm in ML-2 software for calculating the current that flows in an ML-4 electric power system under abnormal conditions. **Minor Document Change.** A document change, as defined by the governing document control program, that includes but is not limited to inconsequential editorial corrections, grammatical and spelling changes, organizational name and acronym changes, and similar type changes. A minor document change does not include revisions, changes, or modifications to a document (e.g., procedure, work instruction, drawing, etc.) which impact the effective implementation of the requirement(s). (Ref. P1020-2)**.** ***Note:*** *Minor document changes alone (i.e., without an associated major document change and/or a major or minor computer program change) do not require a SWNCP.* **Major Document Change.** A document change that is not a minor document change.
2.5	Develop the software change. Describe "what" the change is to sufficient detail to allow a reviewer to understand, review and as appropriate, approve the change request.
2.6	Describe the impacts and potential risks associated with the change. Impacts should include technical as well as estimated commercial impacts (cost, schedule, resources, etc.).
2.7	List affected software baseline documents. Provide document number, revision, document title, and document description.
2.8	List affected software baseline computer programs (including database, configuration files). Provide computer program filename, version, and computer program description.
2.9	Evaluate and indicate the planned type of verification and validation (V&V) for the change by checking the review(s), test(s) and/or alternate calculations(s) box. Check all that apply.

Field	Entry Information
2.10	Describe the V&V to sufficient detail to allow a reviewer to understand, review and approve the change request and the planned approach to V&V. Describe the approach to retesting and acceptance of test results. ***Note:*** *This description is a high-level planned approach/strategy. The final V&V approach and details must be subsequently developed, reviewed and approved.*
2.11	Indicate whether the software is used for control in a hazard category 2 before 3 nuclear facility, high hazard nonnuclear facility, moderate hazard nonnuclear facility, and/or accelerator facility by selecting either "Yes" or "No" from the drop-down menu. If "No" is indicated, go to Step 3.1. If "Yes" is indicated, go to Step 2.8.
2.12	Indicate if a safety basis (SB) evaluation of the change is required per the applicable SB procedures listed on the SB website by selecting either "Yes" or "No" from the drop down menu. (e.g., SBP-15-351, *Design Basis or Safety Basis Change Review,* SBP113-3, *Unreviewed Safety Issue Process.)* If "Yes" is indicated, then the SO ensures the required actions are taken, attaches evidence of completion prior to submitting the SWNCP for approval for use (Section 6.0) and ultimately, use of the software in its intended (working) environment. Proceed to Step 2.9. If "No" is indicated, then proceed to Step 3.1. As required, contact a Facility Design Authority Representative (FDAR) or a safety basis representative for assistance.
2.13	Enter the attached design basis and/or safety basis document numbers associated with the evaluation(s) (e.g., per SBP-112-3, USQD TA55-16-0234-D). If not applicable, enter "NA".

3.0 CHANGE REQUEST REVIEW AND ACCEPTANCE (COMPLETED BY SRLM AND AS REQUIRED, FDAR OR DA)

Field	Entry Information
3.1	The SRLM evaluates the change request and indicates "Accepted", "Accepted with Comments", or "Rejected". Provide comments when "Accepted with Comments" is indicated. Provide reason(s) for rejection when "Rejected" is indicated. ***Note:*** *"Accepted" means that the requested change is acceptable as proposed. "Accepted with Comments" means that the change is authorized as described in comments.*
3.2	Enter the SRLM name, Z number if applicable, organization, signature, and date.
3.3	If the change is a major change for Non-SSC software that is used for administrative control in a LANL facility, then the FDAR or DA evaluates the change request and indicates either "NA", "Accepted", "Accepted with Comments", or "Rejected". ***Note:*** *Where there are multiple FDARs, the LANL Facility Design Authority, or a representative sampling of FDARS (but no fewer than two) must review and sign the request.* ***Note:*** *"Accepted" means that the requested change is acceptable as proposed. "Accepted with Comments" means that the change is authorized as described in comments.* If the software change is a minor change or a change to software that is not used for administrative control in a LANL facility, then the SRLM indicates "NA" and proceeds to Step 4.1.

Field	Entry Information
3.4	Enter the FDAR(s) or DA name, Z number, organization, signature, and date for all decisions other than "NA" in 3.3. If "NA" in 3.3, enter "NA". If the change is rejected, retain the rejected change request as a record in accordance with P1020-1, *Laboratory Records Management* or the governing records management process.

4.0 CHANGE IMPLEMENTATION (COMPLETED BY SO)

Field	Entry Information
4.1	Make the change and enter who implemented the change(s) (Change Implementer(s)). Provide name, Z number if applicable, organization name and date of implementation.
4.2	For software design changes, select from the drop-down menu whether the change was reviewed by the "Original Design Organization" or an "Authorized Alternate Design Organization". Section 6 authorizes the alternate organization. If the change did not involve design (e.g., upgrade from version 2.0 to 3.0 of off-the-shelf (OTS) software), enter NA. ***Note:*** *The design organization approving the change shall have demonstrated competence in the specific design area of interest and have an adequate understanding of the requirements and intent of the original design.*
4.3	Describe the final implementation of the change (e.g., as applicable, provide/attach the relevant computer program listings, including pseudo code). As applicable, include any limitations and changes to use and maintenance processes. For software document changes, provide a detailed description of the document revisions, or attach/hyperlink to the revised documents. Ensure the document revision history describes the associated change(s).

5.0 VERIFICATION AND VALIDATION (V&V) AND READINESS (COMPLETED BY SO)

Field	Entry Information
5.1	Plan and complete V&V, including retesting as required and acceptance of test results. Take actions and provide information to demonstrate conformance with Chapter 21 approval for use requirements. Example information includes test reports, revised SWBL, revised computer program listings, training records, completed Unreviewed Safety Question (USQ) documentation, implementation sequence, etc. Control changes. Attach (or list documents with hyperlinks to) V&V plan documentation; V&V results documentation; and, completed but without the SRLM signature, the revised software baseline (SWBL). For software changes used for ML-1, ML-2 or ML-3 administrative control in a LANL facility, also include the planned implementation sequence. Base the extent of V&V on the complexity of the software, the degree of standardization, the similarity with previously approved software, and the importance to safety. Major changes must be acceptance tested per SOFT-V&V. For minor changes, if review alone is inadequate to determine if requirements are satisfied, use alternate calculations and/or develop and integrate (interim) tests to support the review. For computer programs that were originally commercially dedicated (CGD'd): CGD major changes. CGD minor changes if the change affects the critical characteristic(s) that pertain to the functionality of the computer program and as applicable, the associated SSC.

6.0 CHANGE ACCEPTANCE AND APPROVAL FOR USE (COMPLETED BY SRLM AND AS REQUIRED, FDAR OR DA)

Field	Entry Information
6.1	The SRLM evaluates the change request information to ensure Chapter 21 software change and approval for use requirements have been satisfied and that the software is ready to be used in its intended operating environment. Ensure that interfaces with software systems, organizations and/or activities that the software is based on or otherwise has an interface with, are controlled such that unintended consequences with such systems/organizations do not occur (e.g., coordinate with cybersecurity personnel per PD210, *Cybersecurity Program* or CIO-P100, *Cyber Security Risk Management Plan*). If an alternate design organization reviewed the change, ensure the design organization approving the change has demonstrated competence in the specific design area of interest and has an adequate understanding of the requirements and intent of the original design. Check the appropriate decision box (either "Approved for Use" or "Rejected"). Provide reason(s) for rejection when the "Rejected" box is checked. For assistance in determining the SRLM, see SOFT-GEN Appendix C: *SO and SRLM Decision Diagram for FAC-COE.*
6.2	Enter the SRLM name, Z number if applicable, organization, signature, and date on the SWNCP. If the change is approved for use, enter SRLM information and sign the attached revised SWBL. If rejected, the SRLM retains the rejected SWNCP as a record in accordance with P1020-1, *Laboratory Records Management* or the governing records management process.
6.3	If the software change is a minor change or, a major change for software that is not used for administrative control in a LANL facility, then the SRLM checks the "NA" decision box. If the change is a major change for Non-SSC software used for control in a LANL facility, then the FDAR evaluates the change and implementation sequence of the change in accordance with AP-341-621, *Design Authority Technical Review* and checks the appropriate decision box. ***Note:*** *Where there may be multiple FDARs, the LANL Facility Design Authority (DA), or a representative sampling of FDARS (but no fewer than two) must review.* Provide reason(s) for rejection when "Rejected" box is checked. If rejected, the SRLM retains the SWNCP as a record in accordance with P1020-1, *Laboratory Records Management* or the governing records management process.
6.4	If "NA" in 6.3 is checked, then enter "NA". For other than "NA" in 6.3, enter the FDAR or DA name, Z number, organization, signature, and date. The SWNCP is complete. The SRLM retains the SWNCP as a record in accordance with P1020-1, *Laboratory Records Management* or the governing records management process.

7.0 ATTACHMENTS

Field	Entry Information
7.1	Enter the attachment number for each attachment.
7.2	Enter the attachment title.

8.0 REVISIONS

Field	Entry Information
8.1	If the SWNCP requires revision, then revise in accordance with the governing document control program. Enter the revision number: 1, 2, etc. as appropriate.
8.2	Enter the SWNCP revision approval date.
8.3	Describe the revision and why the revision was made.

Non-SSC Software Change Package Form (SWNCP)

Example for TRIP v2.1

SWNCP No.:	SCP-TA55-SLIP-001	Rev.:	0	Page 1 of 4

1.0 SOFTWARE CHANGE REQUEST INFORMATION (COMPLETED BY REQUESTOR)

1.1 Software Name and Version:	TRIP, v 2.1	1.2 Request Date:	6/16/2017	1.3 Requested By Date:	11/30/2017

1.4 Requestor: *(Name, Z Number if applicable, Organization)*	Amy User
1.5 Software Owner (SO): *(Name, Z Number if applicable, Organization)*	Mike Espinoza, 396743, SAFE-NMCA
1.6 Software Change Request Title:	Add a search function to TRIP that doesn't require MBA number

1.7 TA No.:	55	1.8 Facility No(s):	0514	1.9 Facility Name(s):	Plutonium Facility 514

1.10 Type of Reason for Change:	☐ Defect	☒ Requirement Change

1.11 Reason for Change Request:

Often when I need to use TRIP, I know the room and LANMAS location but have no idea what the MBA is. It would be very helpful to my MAR work if I could search for the LANMAS location without going through the MBA.

2.0 SOFTWARE CHANGE REQUEST DEVELOPMENT (COMPLETED BY SO)

2.1 SWID No.:	SWID-03-0514-420	2.2 Software Designation:	Safety Software	2.3 Assoc. Management Level (ML):	3

2.4 Type of Change:	☒ Major	☐ Minor

2.5 Change Description

Modify the User Interface to search either by MBA (current functionality), by room, or by LANMAS location.

2.6 Software Change Impact/Risk Description:

Low risk. Moderate cost (40 - 80 hours of software engineering work)

2.7 Affected Software Baseline Documents

Document No. (including revision)	Document Title	Document Description
NMCA-UML-TRIP-001	TRIP Users Guide v 2.1	TRIP User Manual
NMCA-TP-TRIP-001	TRIP Requirements Test Plan v2.1	TRIP Test Plan
NMCA-RD-TRIP-002	TRIP Requirements v 2.1	TRIP Requirements Document

Fictitious Example

2.8 Affected Software Baseline – Computer Programs	
Computer Program File Name (Including revision)	Computer Program Description
TRIP_GUI_Search.cpp, 2.3	Main class for TRIP's user interface search function

2.9 Planned Type of Verification and Validation (V&V) for the Change

☒ Review(s): ☒ Test(s): ☐ Alternate Calculation(s):

2.10 Verification and Validation (V&V) Description:

Ensure draft requirements are reviewed and approved by requestor and other user representatives.
Software design updates to be reviewed by independent software engineer.
Software code updates to be reviewed by independent software engineer.
Updated test plan to be reviewed by requestor.
Beta testing to be performed by requestor and other user representatives
Acceptance testing to be performed by requestor.

2.11 Is this software used for control in a hazard category 2 or 3 nuclear facility, high hazard nonnuclear facility, moderate hazard nonnuclear facility, and/or accelerator facility? If "No" is indicated, go to Step 3.1. If "Yes" is indicated, go to Step 2.8.	No
2.12 Does this software change require engagement of the evaluation processes of SBP-15-351, *Design Basis or Safety Basis Change Review* or other safety basis (SB) reviews? If "No" is indicated, go to Step 3.1. If "Yes" is indicated, complete safety basis evaluation(s), before approval for use (Section 6.) and go to Step 2.9. Consider completing evaluations before proceeding further.	No
2.13 Design basis and/or safety basis evaluation(s) document number(s):	

3.0 SOFTWARE CHANGE REQUEST REVIEW AND ACCEPTANCE/REJECTION (COMPLETED BY SRLM AND AS REQUIRED, FDAR OR DA)

3.1 Software Responsible Line Manager (SRLM) Review and Acceptance/Rejection	☒ Accepted ☐ Accepted with Comments ☐ Rejected

If "Accepted with Comments" or "Rejected" is indicated, then provide comments or justification below:

3.2 SRLM: *(Name, Z Number if applicable, Organization, Signature, and Date)*

Payda Toll, 343175, SAFE-DO, 20 June 2017

3.3 FDAR or DA Review and Acceptance (required only for major changes of software used for administrative control in a LANL facility) If "Accepted with Comments" or "Rejected" is indicated, then provide comments or justification below:	☐ NA ☒ Accepted ☐ Accepted with comments ☐ Rejected

Fictitious Example

3.4 FDAR(s) or DA : *(Name, Z Number, Organization, Signature, and Date)*
Stay D. Course, 352313, ES-55, 20 June 2017

4.0 SOFTWARE CHANGE IMPLEMENTATION (COMPLETED BY SO)	
4.1 Change Implementer(s): *(Name, Z Number if applicable, Organization, and Date of Implementation)*	
Mystery Reader, 370764, SAFE-NMCA, 10 October 2017	
4.2 Design Organization Reviewing Software Design Change:	Original Design Organization
4.3 Implemented Change Description:	
Modify the User Interface to search either by MBA (current functionality), by room, or by LANMAS location.	
5.0 SOFTWARE CHANGE VERIFICATION AND VALIDATION (V&V) & REQUEST FOR APPROVAL FOR USE (COMPLETED BY SO)	
5.1 The software change has been V&V'd in accordance with the attached V&V planning documentation. The approval for use requirements of Chapter 21 associated with this change have been satisfied. The revised software baseline (without SRLM signature), V&V results, and as required, other supporting approval for use documentation associated with this change is attached. Approval for use is requested.	
SO:*(Name, Z Number if applicable, Organization, Signature, and Date)*	
Mike Espinoza, 396743, SAFE-NMCA, 31 October 2017	
6.0 CHANGE ACCEPTANCE AND APPROVAL FOR USE (COMPLETED BY SRLM AND AS REQUIRED, FDAR OR DA)	
I (a) accept the software change; (b) attest that the software change and the approval for use requirements of Chapter 21 have been satisfied; and, (c) attest that the software is ready to be used in its intended operating environment.	
6.1 Software Responsible Line Manager (SRLM) Review and Acceptance	☒ Approved for Use ☐ Rejected
If "Rejected" is checked, then provide reason below:	
6.2 SRLM: *(Name, Z Number if applicable, Organization, Signature, and Date)*	
Payda Toll, 343175, SAFE-DO, 31 October 2017	
6.3 FDAR or DA Review and Acceptance (for major changes only)	Not Applicable (NA) ☐ Approved for Use ☒ Rejected ☐
If "Rejected" is checked, then provide reason below:	
6.4 FDAR or DA: *(Name, Z Number, Organization, Signature, and Date)*	
Stay D. Course, 352313, ES-55, 2 November 2017	

Fictitious Example

7.0 ATTACHMENTS	
7.1 Attachment No.	7.2 Attachment Title
1	Sketch of desired search user interface
2	Screen shot of final user interface
3	Test plan revision 2.2
4	Requirements revision 2.2
5	User manual revision 2.2

8.0 REVISIONS		
8.1 Revision No.	8.2 Date	8.3 Revision Description and Reason for Revision
NA	Click here to enter a date.	

Fictitious Example