GENERAL

This software data sheet, and the documents referenced herein, provide the *software-specific* information necessary to implement the requirements of STD-342-100, *LANL Engineering Standards Manual, Chapter 21 – Software* (hereafter *Chapter 21*). This form promotes the successful and consistent implementation of the software data sheet (SWDS) requirements of Chapter 21. For definitions, general requirements, and processes, see Chapter 21, SOFT-GEN.

This form is developed (D) by the Software Owner (SO); and at a minimum, reviewed and approved (R, A) by the Software Responsible Line Manager (SRLM).

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

Establishing use and maintenance requirements (Field 7) using SOFT-MAINT: The Initial SWDS revision may have TBD for some use and maintenance parameters that are not known in the early planning stage and will be determined at a future date.

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

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.

HEADER

Field	Entry Information
Software Name	Enter the name of the software in the upper right-hand corner of the header after the title (e.g., Software Data Sheet Form (SWDS) *for CAESAR II Software*).
SWDS No.	The numbering scheme of this form follows that of the SRLM's document control/records management system. For software used in the operation of existing or new LANL facilities, use numbering scheme and process specified in AP-341-402, *Engineering Document Management in Operating Facilities*.
Rev.	Enter the SWDS revision number. Initial issue is 0.

1.0 SWDS PURPOSE, AUTHORITY AND APPLICABILITY

Field	Entry Information
1.1	Review, and as required, revise introductory text to ensure accuracy for the subject software with respect to SWDS purpose, authority, and applicability.
1.2	Enter the name of the software. Do not enter the software revision as revisions may change over time. Use the Software Baseline (SWBL) to track the software revision.
1.3	Enter the software identification number (SWID). *The SWID should normally be the same SWID as on the Form 2033. Obtain per AP-341-402,* Engineering Document Management in Operating Facilities (e.g., *the CoE SharePoint Document Numbering Site*). Ensure the SWID is part of subsequent software documentation.

Field	Entry Information
1.4	Enter the two-digit Technical Area (TA) number(s) where the software is used. If used sitewide, enter 99.
1.5	Enter the facility number(s) where the software is used. Follow AP-341-402 conventions for utilities, multiple, etc. (e.g., i*f multiple, enter MULT…)*
1.6	Enter the facility name(s) where the software is used.
1.7	Describe what the software does.
1.8	Describe why the software is needed (justification).
1.9	Indicate whether the software is SSC Software or non-SSC software by checking the appropriate box. Check only one box.
1.10	For SSC software, enter the equipment identification number associated with the software per ESM Chapter 1, Section 200 (e.g., 03-0216-HVAC-BAS-1). For new SSC software where the equipment identification number is not yet established, enter TBD. For Non-SSC software, enter NA.
1.11	Indicate the highest management level (ML) associated with the software (where ML-1 is highest, ML-4 lowest). Reference AP-341-502. If the software is associated with multiple MLs, check the highest ML box. Check only one box.
1.12	Select the software designation (safety software, risk significant software [RS] or commercially controlled software [CC]) from the drop-down menu. Select only one designation.

2.0 ROLES AND DOCUMENT APPROVALS

Field	Entry Information
2.1	Revise the example text as needed to indicate how future name changes are addressed in the SWDS. (e.g., modify reference to the Form 2033/GSI software inventory if needed. One may indicate “Changes to the SRLM will be documented in a revision to this document; for other role name changes, contact the SRLM” or similar text.)
2.2	Enter the name of the person(s) filling the Chapter 21 role(s) at the time the SWDS is generated. For assistance in determining the SO and SRLM, see SOFT-GEN Appendix C: *SO and SRLM Decision Diagram for FAC-COE.* One person—i.e., one software user (SU) etc.—is a sufficient representative sample for SUs. Reference to a role listing outside of the SWDS is acceptable (e.g., for SUs, “see Safety Basis Analysts as identified on Safety Basis Division Website”). ***Note:*** The SWDS does not need to be revised if persons in the required roles change as long as the person filling the role is adequately communicated through other means.
2.3	Enter the Z number (if available). Enter NA if not available.
2.4	Enter an “x” for each role that the person is filling. Note that one person may serve multiple roles. For any roles that the SRLM wishes to electively require SWDS review and approval, enter “(R, A)” after the role.

2.5	Enter the date and either initials or signature that the SWDS was reviewed (R) and approved (A). The effective date of the document is the date of the last acquired signature unless otherwise indicated. Electronic approvals are acceptable. Enter for those roles in block 2.4 where R, A is indicated. At a minimum, the SLRM must review and approve the SWDS. For roles that do not require review and approval of the SWDS, leave blank or enter NA.
2.6	Enter text as necessary to clarify Chapter 21 roles. If adding roles that are in addition to those in Chapter 21, specify the roles and responsibilities in this section. If no clarifications are necessary, enter "NA".

3.0 REQUIREMENTS

Field	Entry Information
3.1	Enter the requirements in the order of precedence. (i.e., Requirement document 1 takes precedence over requirement document 2.) Include the document number and name and revision. Include any limitations as applicable. The requirements may also be entered directly rather than in separate requirements documents. For example, "For LANL applications, software should only be used with ASME B31.3-2016 Ver. 1.1 database file"; "Use only modules 2 and 3; do not use other modules". ***Note:*** Subsequent changes to the requirements in this section are managed using the Software Baseline (SWBL).
3.2	Enter high-level key planning assumptions/constraints. Planning assumptions/constraints are those that may affect the overall design/acquisition approach, scope, schedule or cost (e.g., software, operating system, and computer hardware upgrades are assumed every three years starting in the current year and will require full software verification and validation as well as revisions to most software quality documentation.)

4.0 SCOPE/DELIVERABLES

Field	Entry Information
4.1	Enter the software deliverables required throughout the software life cycle. See SOFT-GEN section, Attachment B for a summary of Chapter 21 deliverables. These deliverables summarize the scope of the software project.

5.0 ACQUISITION/DESIGN STRATEGY

Field	Entry Information
5.1	Indicate if the software is existing or new. Describe the approach that was, and/or will be used, to acquire/design the software; address support software and associated hardware. If the software is safety software (ML-1 or ML-2 only) indicate whether the software will be acquired from an NQA-1 qualified supplier or whether it will acquired from a Non NQA-1 qualified supplier using commercial grade dedication (CGD). See acquisition factors such as cost and supplier availability in SOFT-ACQUIRE. Provide a summary level description of what work was, and/or will be performed by LANL personnel and what work was, and/or will be performed by supplier(s). Indicate whether the software will be for used on a server (generally preferred) or standalone computer. Describe licenses, registrations, problem reporting, and/or services that must be maintained.

6.0 SOFTWARE PROJECT MANAGEMENT (PM)

Field	Entry Information
6.1	Provide estimated software costs for the next five years. Use the high-level Work Breakdown Structure (WBS) below or other desired WBS as an aid. Attach supporting detail as required. See SWDS example. **WBS 1.1 - Design/Acquire Software.** This is the software design and/or acquisition. It includes planning, documentation (for hardware and software), software quality assurance activities, Verification and Validation (V&V) and all other activities associated with software design and/or acquisition. It includes labor, equipment and materials. **WBS 1.2 – Design/Acquire Hardware.** This is the associated hardware. It includes computer servers, computer workstations, etc. It includes labor, equipment and materials. **WBS 1.3 – Install/Approve for Use.** This is software and hardware installation; associated installation V&V; and approval for use. It includes labor, equipment and materials. **WBS 1.4 – Use and Maintain**. This is the use and maintenance of the integrated software/hardware system. It includes software license fees, training costs, problem reporting, corrective action, configuration management, in-use testing, assessments etc. ***Note:*** Cost and schedule information are planning level estimated provided to help management allocate sufficient resources to successfully manage the software throughout its lifecycle. Detailed cost estimating is not required.
6.2	As determined by the SRLM, add software specific project management (PM) detail here for those software projects where such detail is necessary to successfully manage the software. (An example of this would be target schedule milestone dates for completion of software requirements definition, software design/acquisition, software final acceptance testing, software approval for use.) If not necessary, enter NA. ***Note:*** Other PM considerations (e.g., schedule, reporting, etc.,) are normally addressed as part of the SLRM's work control and/or integrated hardware project management protocols.

7.0 USE AND MAINTENANCE

Field	Entry Information
7.1	Describe the person(s) and process for authorizing software users/administrators. (For facility engineering Non-SSC ML-1 through 3 software, this will be the Form 2033 Graded Software Inventory), inked from the Ch. 21 webpage under references.
7.2	Enter the minimum training and access controls/vulnerability protections a person must follow to be an authorized software user (e.g., required reading, Cryptocard access level, training courses, certifications, etc.). An authorized user is authorized to use the software for its intended purpose. An authorized user does not have the authority to make changes to the computer program code and/or perform software maintenance activities. Required reading of the SWDS and associated user documentation should typically be specified, particularly when there are known software limitations or reported errors.
7.3	Enter the minimum training-related activities that a person must fulfill to be an authorized software administrator (required reading, training courses, certifications, etc.). An authorized administrator is an authorized user who also has authority to make changes to the computer program code and/or perform software maintenance activities.
7.4	Indicate whether a software risk register is planned by checking either the yes or no box. (per SOFT-GEN, having one is optional). If yes, complete it and attach it to the SWDS. (Providing a reference [e.g., title, document number, hyperlink] to a stand-alone risk register is also acceptable.)
7.5	If a risk register is not present, enter "NA". If register is present, indicate the minimum frequency that the risk register must be reviewed and, as required, revised to ensure its accuracy. A minimum of once per year is recommended. Revision of the register could capture that the review occurred; otherwise, another means may be chosen by SRLM.
7.6	Indicate the minimum frequency that a software quality assessment must be performed, and the assessment methods (e.g., surveillance, audit, etc.). See P328-1, *Performance Assurance Planning Cycle and Integrated Assessment Schedule Maintenance* for scheduling guidance. Multiple assessment methods are acceptable (e.g., P328-5, *Assessments or* AP-341-901, *Performing Vital Safety System Assessments* per P341, *Facility Engineering Processes Manual*). Software quality may be assessed as part of broader assessments.
7.7	Indicate whether in-use testing is required by checking either the yes or no box. (In-use testing is required for ML-1 and ML-2 software and recommended for ML-3 software). See SOFT-MAINT. In-use testing must be performed when software is installed on a different computer or after significant software changes.
7.8	Indicate the minimum frequency that in-use tests must be performed, and the acceptable test method(s). Enter "NA" if in-use tests are not required. Note that in-use software tests may be an element of broader tests as long as they satisfy the software in-use test requirements.
7.9	Indicate the problem reporting and corrective action (PR&CA) processes to be used. Check all that apply. If other is checked, either describe the process in the space and/or reference the process. Include "who", "when", and "how" to report problems and take corrective action. Ensure the process satisfies Chapter 21 (SOFT-GEN) PR&CA requirements. ***Note:*** Less formal methods may be used through development and testing (e.g., bug lists);

Field	Entry Information
	however, once the software is approved for use, formal methods apply. If more than one method is checked, clarify which method applies and when it applies. ***Note:*** *For acquired software, check "other" and indicate the minimum frequency the SRLM should review supplier and/or other pertinent organization (e.g., NRC) problem reports, notifications, knowledge bases, websites or other information sources that could affect software management and/or use. For non-SSC, facility engineering software, each review should be documented in the graded software inventory. For SSC software, each review should be documented in the associated SSC operations documents (e.g., operator logs etc.)*
7.10	As required, provide any other software-specific protocols required to promote proper software use, maintenance and retirement (e.g., operational event documentation review and retention protocols, application log protocols, etc.). See SOFT-MAINT for additional information. Enter NA if not applicable.

8.0 ATTACHMENT LIST

Field	Entry Information
8.1	List attachments as appropriate. Enter the attachment number.
8.2	Enter the attachment title.

9.0 SWDS REVISION HISTORY

Field	Entry Information
9.1	Enter the revision number and update the revision number in the form header.
9.2	Enter the date of the revision from the date drop down menu for past revisions. For current revision, enter "Last approval date in Section 2.0" or similar text.
9.3	Enter a summary description of what was revised and the reason for the revision.

SWDS No.:	SWDS-16-03-2333-0089	Rev.:	0

1.0 SWDS PURPOSE, AUTHORITY AND APPLICABILITY

1.1 Introduction:	The purpose of this software data sheet (SWDS) is to provide the software-specific, software quality management implementing details for the subject software in accordance with STD-342-100, *LANL Engineering Standards Manual*, *Chapter 21* – *Software* (hereafter *Chapter 21*). Use of Chapter 21, this SWDS and the documents referenced therein, provide reasonable assurance that the software will consistently, compliantly and efficiently satisfy its intended use. This SWDS is issued under the authority of the software owner responsible line manager (SRLM). The SRLM is responsible for managing and maintaining this document in accordance with Chapter 21. This document applies to LANL employees, and as specified in subcontracts, subcontractors.

1.2 Software Name:	Combustible Material Tracker (CBT) Software			1.3 SWID:	03-2333-045
1.4 TA Number(s):	03	1.5 Facility Number(s):	2333	1.6 Facility Name(s):	Nonproliferation Security Facility (SF)
1.7 Software Description:	The software is used as a tool to track combustible material				
1.8 Software Need:	The software is needed because tracking combustible material manually (without software) is less efficient and error-prone.				
1.9 SSC Software/Non-SSC Software:	SSC ☐ Non-SSC ☒			1.10 Equipment ID:	NA
1.11 Highest Management Level (ML) Associated with the Software:	ML-1 ☐	ML-2 ☐	ML-3 ☒	ML-4 ☐	
1.12 Software Designation:	Safety Software				

2.0 ROLES AND DOCUMENT APPROVALS

2.1 The names of those filling roles at the time this SWDS was generated are indicated below. This SWDS was developed **(D)** by the SO and reviewed and approved **(R, A)** by the SRLM (and others if indicated below). See the Form 2033/GSI software inventory for any subsequent name changes to key roles.

2.2 Name (Last, First):	2.3 Z Number:	2.4 Role:										2.5 SWDS Approval and Approval Date:
		SO (**D**)	SRLM (**R, A**)	SD	SD RLM	SU	SU RLM	EDAR or DA	Independent Design V&V	Other	Other	
Trujillo, Robin	124268	x										R. Trujillo signature, 9/25/16
Lopez, Pete	121987		x				x					P. Lopez signature, 9/27/16
Walker, John	123495									x[1]		J. Walker signature, 09/27/16

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Vigil, Mary	115970			x								NA
Thompson, Tom	143987				x							NA
Bradley, Mike	114987					x						NA
Heitkamp, Heidi	121987							x	x			NA

2.6 Role Comments/Clarifications:

[1] The ISSO Representative (Rep.) is responsible for: (a) ensuring applicable PD210, *Cybersecurity Program,* CIO-P100, *Cyber Security Risk Management* cybersecurity/security requirements are identified and reported to the SRLM; and, for (b) supporting implementation of such requirements.

3.0 REQUIREMENTS

3.1 Software Requirements, Limitations and Hierarchy (See SWBL for latest revisions)::	1. ESM Chapter 21, Software 2. SRS-15-03-NSF-0002 CBT Software Requirements Specification 3. Limitation: Use only software modules 2 and 3; do not use other modules.
3.2 Key Planning Assumptions/Constraints:	1. The upgrade must be completed by July 1, 2017. If not completed by that date, Los Alamos Field Office authorization is required to operate with existing software. 2. Software, software operating system, and supporting computer hardware will required upgrade/replacement approximately every four years.

4. SCOPE/DELIVERABLES

4.1 Deliverables:	1. Form 2033 and revisions. 2. Documents (e.g., user manual) and computer programs as per SBL-15-03-2333-0234 (and subsequent revisions), Software Baseline for CBT with software replacement (including operating system) frequency estimated every 4 years. 3. Hardware as listed in SD-15-03-NSF-0006, CBT Software Design Document; Programmable Logic Controllers and associated devices (e.g., firewalls) replacement frequency estimated every 4 years. 4. Approval for use documentation (Section SOFT-V&V, Att. B, as required) 5. Non-SSC Software Change Packages (Section SOFT-GEN, Att. E, as required) 6. Problem reporting & corrective action documentation (as required) 7. Institutional-level software inventory updates as required. 8. Software quality assessment reports, bi-annual or as required. 9. Software risk register updates, as required. 10. Software data sheet (this document) revisions, as required. 11. Operational event documentation

Sensitive Data

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5. ACQUISITION/DESIGN STRATEGY

5.1 Acquisition/Design Strategy:	▪ **Primary Software:** The primary software is an existing C++ code. This code will undergo re-design by qualified LANL programmers and include software code/deliverables as required by ESM Chapter 21 for ML-3 software. ▪ **Support Software:** Support software is off-the-shelf software (e.g., MS 2003 and MS Windows XP) that will be acquired as ML-4 software from LANL Electronic Software Distribution (ESD). ▪ **Hardware:** Hardware is conventional PLC related hardware and peripherals that will be procured as ML-4 hardware.

6.0 SOFTWARE PROJECT MANAGEMENT (PM)

6.1 Rough Estimate of Software Project Cost, K$

Fiscal Year (FY):					Total, K$ (5 FY):
Current FY (FY1)	FY2	FY3	FY4	FY5	
540	215	200	230	655	1,840

6.2 Other PM Considerations:	NA

7. USE AND MAINTENANCE

Use and maintain software in accordance with the requirements and limitations in Section 3.0 and the following:

7.1 Software User/Administrator Authorization Process:	▪ The SRLM will identify, evaluate and authorize software users and administrators based on need and the knowledge, skills and abilities required as indicated in this document via the SWDS or referenced webpage. Authorized users are identified on the ES Division Non-SSC Software Inventory website.
7.2 Authorized Software User Requirements:	▪ Online UTrain Course No. 45412, SWDS-16-03-2333-0089, *Software Data Sheet (SWDS) for CBT Software,* ▪ Online UTrain Course No. 45458, UM-15-03-NSF-001, CBT *User Manual,* ▪ Online UTrain Course No. 52346, AP-15-03-NSF-0007, *CBT Administrative Procedure, and* ▪ Must have LANL Unclassified (Yellow) Cryptocard to access
7.3 Authorized Administrator Requirements:	▪ Authorized Software User Requirements, ▪ Online UTrain Course No. 12341, MM-15-03-NSF-0009, CBT *Maintenance Manual*, and ▪ Minimum of five (5) years of experience in C++ programming

7.4 Software Risk Register Required?	Yes ☐	No ☒	7.5 Risk Register Minimum Review/Frequency:	NA
7.6 Minimum Assessment Frequency & Method(s):			3 years, Management Assessment per P328-3	

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7.7 In-Use Testing Required?	Yes ☒	No ☐	7.8 Minimum In-Use Test Frequency & Method(s):	12 months, perform in-use test specified in software baseline (SWBL)
7.9 Problem Reporting and Corrective Action (PR&CA)	☒ P330-6, *Nonconformance Reporting* and/or P322-4, *Issues Management*			
	☐ Other (Describe): _____			
7.10 Other	NA			

8.0 ATTACHMENT LIST

8.1 Attachment No.	8.2 Attachment Title
A1	CBT Software Cost Estimate Supporting Detail, Rev. 0

9.0 SWDS REVISION HISTORY

9.1 Revision	9.2 Revision Date	9.3 Revision Description and Reason for Revision
0	Last approval date in Section 2.0	Initial issue

Fictitious Data

SWDS No.: SWDS-16-03-2333-0089 Rev.: 0

ATTACHMENT

Attachment A1: 09/17/2016, CBT Cost Estimate Supporting Detail, Rev. 0

Item No:	Item Name:	Rough Estimated Cost, K$:					
		Fiscal Year (FY):					Total, K$ (FY17 – FY21):
		2017	2018	2019	2020	2021	
1	Design/Acquire Software	200	0	0	0	235	435
2	Design/Acquire Hardware	0	0	0	0	25	25
3	Install/Approve for Use	150	0	0	0	175	325
4	Use and Maintain	190	215	200	230	220	1,055
Total		**540**	**215**	**200**	**230**	**655**	**1,840**

Key Cost & Schedule Clarifications:

1. Costs are fully burdened at 25% of direct costs and escalated at 4% per year.
2. Design/Acquire Software costs include documentation update costs.
3. Software upgrade costs includes cost to upgrade existing version of Combustible CBT server and workstation support software (e.g., Windows Server 2016 and MS Office Outlook) to newer versions.
4. Maintenance cost includes 0.5 FTE SO Level of Effort (LOE) at $180 /hour (burdened); and a bi-annual software quality assessment at an average $20k per assessment. Maintenance costs do not include annual supplier service contract maintenance, notifications knowledge base updates.
5. Hardware costs include costs for servers, workstations, field scanners, firewall, and router see hardware listing in SWDD-15-03-NSF-0006.
6. All work is planned to begin in 1st quarter of shown FY and end in third quarter of same FY to allow for a three-month schedule contingency within each FY.
7. The SO will report issues of concern/deviations in scope, schedule or cost that adversely affect the software plan to the SRLM as part of the reporting processes associated with use of the software (e.g., issues with software scope, schedule or cost for software used in the facility design/analysis of facilities is reported as part of the project/modification that requires the design/analysis.
8. FY17 hardware costs covered by ES Division Office as part of ES Server 0294 software FY17 upgrade.

Fictitious Data