

**ATTACHMENT 1: CHAPTER 21 SUMMARY TABLE**

Rev	Date	Description	POC	RM
0	06/23/16	Initial issue	Tobin Oruch, ES-DO	Mel Burnett, CENG-OFF

This table is summary of the entire chapter, addressing both SSC software and Non-SSC software. Every attempt is made to keep it in sync with the requirements in each Section; however:

- Section requirements are also more detailed, and
- In the case of a conflict, contact the Chapter POC (Section requirements will generally supersede those in this summary).

1 Section SOFT-GEN: General Software Requirements

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Section Name/ Subsection <sup>1</sup>	Activity Description	Deliverable	SSC Software ML <sup>2</sup>				Non-SSC Software ML <sup>2</sup>			
			1	2	3	4	1	2	3	4
SOFT-GEN, 2	Identify software, evaluate and complete software determination	Software list	R	R	R	G	R	R	R	R
		Form <a href="#">2033</a>	R	R	R	G <sup>3</sup>	R	R	R	G <sup>3</sup>
SOFT-GEN, 3	Plan software-specific activities	Software data sheet form SOFT-GEN-FM03 (SWDS)	R	R	R	-	R	R	R	-
SOFT-GEN, 4	Develop and maintain a software baseline (SWBL)	Software baseline form SOFT-GEN-FM01 (SWBL) <sup>4</sup>	R	R	R	-	R	R	R	-
SOFT-GEN, 4	Control software changes:									
	Less than minor change, minor and major changes made <u>before or after</u> software approval for use (SWAU)	Documented comment in the computer program where feasible	R	R	R	R	R	R	R	R
	Minor or major changes made <u>before</u> SWAU	<a href="#">AP-341-519</a> change documents <sup>5</sup>	R	R	G	G	-	-	-	-
	Minor or major changes made once software is baselined	Revised SWBL <sup>4</sup>	R	R	R	-	R	R	R	-
	Minor or major changes made <u>after</u> SWAU	SSC Software Change Form <a href="#">AP-341-507-FM01</a>	R	R	G	-	-	-	-	-
Non-SSC Software Change Form SOFT-GEN-FM02 (SWNCP)		-	-	-	-	R	R	G	-	
SOFT-GEN, 5	Report problems and take corrective action:									
	Before SWAU	<a href="#">P330-6</a> , <a href="#">P322-4</a> , bug lists, documented comment field in the computer program	R	R	R	G	R	R	R	G
	After SWAU	<a href="#">P330-6</a> , <a href="#">P322-4</a> documents (e.g., Nonconformance Reports [NCRs])	R	R	R	G	R	R	R	G
SOFT-GEN, 6	Manage software (project) risks	Risk list as part of SWDS	R	R	R	G	R	R	R	G

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SOFT-ACQUIRE, 3, 4	Acquire existing LANL software if suitable	Update authorized users/SWDS as required; generate an interface agreement where desired	-	-	-	-	R	R	R	G
SOFT-ACQUIRE, 3, 4	Acquire new software	▪ Statement of Work (SOW)	R	R	R	-	R	R	R	-
		▪ SWDS	R	R	R	-	R	R	R	-
		▪ Commercial Grade Dedication (CGD) Documentation per <a href="#">AP-341-703</a>	R <sup>6</sup>	R <sup>6</sup>	R <sup>6</sup>	-	R <sup>6</sup>	R <sup>6</sup>	R <sup>6</sup>	-
		▪ P-card/Purchase Order (PO)	R	R	R	R <sup>7</sup>	R	R	R	R <sup>7</sup>
		▪ <a href="#">Exhibit H</a>	R	R	R	R <sup>8</sup>	R	R	R	R <sup>8</sup>
SOFT-DESIGN, 3, 6	Develop software design requirements (input)	▪ Software design inputs : <ul style="list-style-type: none"> <li>○ SSC drawings</li> <li>○ SSC performance specification</li> <li>○ SSC FDD or SDD</li> </ul>	R	R	G	G	-	-	-	-
		▪ Other SSC design inputs/outputs as required ▪ Software system requirements specification (SWYRS)	-	-	-	-	R	R	G	G
SOFT-DESIGN, 4, 7	Design the software (output)	▪ Software design outputs : <ul style="list-style-type: none"> <li>○ software specification (SWRS)</li> <li>○ software design (SWDD)</li> <li>○ software system hazard analysis and mitigation documentation (SWHA)</li> <li>○ software design traceability documentation (SWTM)</li> <li>○ SOFT-GEN deliverables</li> <li>○ Other software design deliverables as required</li> <li>○ Operations and maintenance (O&amp;M) instructions</li> <li>○ computer model mathematical terms<sup>10</sup></li> </ul>	R	R	G	G	R	R	G	G

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SOFT-DESIGN, 5, 8	Translate the software design into computer program language (code)	<ul style="list-style-type: none"> <li>▪ Computer program language (code):                             <ul style="list-style-type: none"> <li>○ data structures/files,</li> <li>○ source code (where feasible),</li> <li>○ executable code</li> </ul> </li> <li>▪ Computer program listings</li> </ul>	R	R	G	G	R	R	G	G
SOFT-V&V, 4	Review (input) requirements	<ul style="list-style-type: none"> <li>▪ Dispositioned review comments</li> </ul>	R	R	G	G	R	R	G	G
SOFT-V&V, 4	Develop and review the test plan (SWTP)	<ul style="list-style-type: none"> <li>▪ Test plan</li> <li>▪ Dispositioned review comments</li> </ul>	R	R	G	G	R	R	G	G
SOFT-V&V, 4	Review the software design (SWDD)	<ul style="list-style-type: none"> <li>▪ Software design</li> <li>▪ Dispositioned review comments</li> </ul>	R	R	G	G	R	R	G	G
SOFT-V&V, 4	Review computer program code where feasible	<ul style="list-style-type: none"> <li>▪ Dispositioned code review comments</li> </ul>	R	R	-	-	R	R	-	-
SOFT-V&V, 4	Test and review test results	<ul style="list-style-type: none"> <li>▪ Interim tests and test (qualification) reports</li> <li>▪ Simulated acceptance test and acceptance test report</li> <li>▪ Acceptance test and test (qualification) report (SWTR)</li> <li>▪ Dispositioned review comments</li> </ul>	R	R	G	G	R	R	G	G
SOFT-V&V, 4	Review and approve software for use (SWAU)	<ul style="list-style-type: none"> <li>▪ SWAU request package</li> <li>▪ Dispositioned review comments</li> <li>▪ Software approval for use form SOFT-V&amp;V-FM01, SWAU</li> </ul>	R	R	G	-	R	R	G	-
SOFT-INV, 3, 4	Inventory safety software	<ul style="list-style-type: none"> <li>▪ Updated institutional-level safety software inventory</li> </ul>	R	R	R <sup>11</sup>	-	R	R	R <sup>11</sup>	-
		<ul style="list-style-type: none"> <li>▪ ES-Div: Updated ES Non-SSC software inventory</li> </ul>	-	-	-	-	R	R	R <sup>11</sup>	-
SOFT-INV, 3, 4	Inventory non-safety software	<ul style="list-style-type: none"> <li>▪ ES-Div: Updated ES non-SSC software inventory</li> <li>▪ ES-Div: Form <a href="#">2033</a> to ESSC</li> </ul>	-	-	-	-	R	R	R	R

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SOFT-MAINT, 3, 4	Use and maintain the software	<ul style="list-style-type: none"> <li>▪ Operation and maintenance (O&amp;M) documentation</li> <li>▪ Operational event documentation</li> <li>▪ Application logs</li> <li>▪ Licenses and registrations</li> <li>▪ Access controls</li> <li>▪ Computer system vulnerability protections</li> <li>▪ Problem reports and corrective actions per SOFT-GEN</li> <li>▪ In-use test plans, tests, review documentation, and test reports per SOFT-V&amp;V</li> <li>▪ Updated, configuration management, SWDS and deliverables as described on SWDS and SWBL per SOFT-GEN</li> <li>▪ Accurate software inventory per SOFT-INV</li> <li>▪ Other quality assurance control documentation (e.g., training records, assessments)</li> </ul>	R	R	G	G	R	R	G	G
SOFT-MAINT, 3, 4	Retire the software	<ul style="list-style-type: none"> <li>▪ Software removed to prevent unintended or routine use</li> <li>▪ Terminated licenses/agreements</li> <li>▪ Updated software inventory(ies)</li> <li>▪ Cancelled or revised affected documents</li> <li>▪ Software record</li> </ul>	R	R	R	R	R	R	R	R

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<p>Notes:</p> <p><sup>1</sup> ESM Chapter 21 section name and subsection number.</p> <p><sup>2</sup> See Form 2033 for a crosswalk between MLs and software type, category and SRL. R = Required. G = Required but graded. “-“ = Not required.</p> <p><sup>3</sup> Complete Form 2033 for ML-4 software only if there is a reasonable probability that it could be ML-1, ML-2, or ML-3 software, or, the highest function of the SSC is greater than ML-4.</p> <p><sup>4</sup> See SOFT-GEN-FM01, <i>Software Baseline Form (SWBL)</i>; the SWBL may be included as part of a system design description (SDD) or other controlled document. The SWBL must include documents and computer program files.</p> <p><sup>5</sup> Includes Field Change Notices (FCNs), Field Change Requests (FCRs), Interim Work Requests (IWRs), Design Revision Notices (DRNs), Design Change Forms (DCFs) as described in AP-341-519 unless specifically superseded by another administrative procedure.</p> <p><sup>6</sup> Required only for safety software only that is not procured from an NQA-1 qualified supplier.</p> <p><sup>7</sup> A PO or a Purchase Card (P-card) can be used for ML-4 software; a P-card cannot be used for ML1 through ML-3 software.</p> <p><sup>8</sup> Required if the supplier comes onsite (at LANL) to install and/or maintain software.</p> <p><sup>9</sup> Required if software is acquired from LANL organizations, DOE sites or government agencies.</p> <p><sup>10</sup> Required for computer program models only.</p> <p><sup>11</sup> Required if safety software.</p>										