ATTACHMENT 1: CHAPTER 21 SUMMARY TABLE

Rev	Date	Description	POC
0	06/23/16	Initial issue	Tobin Oruch, ES-DO
1	05/25/17	Updated for Rev. 1 of chapter	Tobin Oruch, ES-DO
2	02/11/26	Updated for Rev. 2 of chapter	Tobin Oruch, ES-FE

This table is summary of the entire chapter (less SOFT-INTRO), addressing both SSC software and Non-SSC software. It is largely synchronized with the requirements in each Section; however:

- Sections have text and Section-specific tables that are more detailed, and
- In the case of a conflict, contact the Chapter POC (Section requirements will generally supersede those in this summary).

Table 21.ATT 1 Chapter 21 Summary by Software Management Level (ML)
This table is a summary only (does not include all requirement details, nor much of SOFT-INTRO). See text of Section(s) for details.

Section Name/ Subsection[1]	Activity Description	Deliverable	SSC Software ML[2]			Non-SSC Software ML[2]		
			1, 2	3	4	1, 2	3	4
SOFT-GEN, 2	Identify software, evaluate and complete software determination	Software summary (only required for subcontractors; ref. SOFT-INTRO, §6.2.A)	R	R	R	R	R	R
		Form 2033	R	R	Gr[3]	R	R	Gr[3]
SOFT-GEN, 3	Plan software-specific activities	Software data sheet form SOFT-GEN-FM01 (SWDS)	R	R	-	R	R	-
SOFT-GEN, 4	Inventory SSC software	Updated Form 2033/graded software inventory	R	R	-	-	-	-
SOFT-GEN, 4	Inventory non-SSC Facility Eng software (e.g., ES, PFE, PIE)	Updated Form 2033/graded software inventory; see SOFT-MAINT §4.1	-	-	-	R	R	R
SOFT-GEN, 5.1	Develop and maintain a software baseline (SWBL)	Software baseline form SOFT-GEN-FM02 (SWBL)[4]	R	R	-	R	R	-
SOFT-GEN, 5	Control software changes:							
	Less than minor change, minor and major changes made before or after software approval for use (SWAU)	Documented comment in the computer program where feasible	R	R	R	R	R	R
	Minor or major changes made before SWAU	AP-341-519 change documents[5]	R	Gr	Gr	-	-	-
	Minor or major changes made once software is baselined	Revised SWBL[4]	R	R	-	R	R	-
	Minor or major changes made after SWAU	SSC Software Change Form SOFT-GEN-FM04	R	Gr	-	-	-	-
		Non-SSC Software Change Form SOFT-GEN-FM03 (SWNCP)	-	-	-	R	Gr	-
SOFT-GEN, 6	Report problems and take corrective action (PR&CA):							
	Before SWAU	bug lists and/or documented comment field in the computer program	R	R	Gr	R	R	Gr

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			1, 2	3	4	1, 2	3	4
	After SWAU	P330-6 (Nonconformance Reports [NCRs]), P322-4 (IM), other methods.	R	R	Gr	R	R	Gr
SOFT-GEN, 7	Manage software (project) risks	Risk register (SWRR or list) as part of SWDS	-	-	-[12]	-	-	-[12]
SOFT-ACQUIRE, 2.1	Acquire existing LANL software if suitable	Update authorized users/SWDS as required; generate an interface agreement where desired	-	-	-	R	R	Gr
SOFT-ACQUIRE, 2.1, 2.2	Acquire new software	▪ Statement of Work (SOW)	R	R	-	R	R	-
		▪ SWDS	R	R	-	R	R	-
		▪ Commercial Grade Dedication (CGD) Documentation per AP-341-703	R[6]	R[6]	-	R[6]	R[6]	-
		▪ P-card/Purchase Order (PO)	R	R	R[7]	R	R	R[7]
		▪ Exhibit H	R	R	R[8]	R	R	R[8]
		▪ Inter-/Intra- LANL Agreements[9]	R[9]	R[9]	R[9]	R[9]	R[9]	R[9]
SOFT-DESIGN, 3	Develop software design requirements (design input)	▪ Software design inputs: ○ SSC drawings ○ SSC performance specification ○ FDD or SDD ▪ Other SSC design inputs/outputs as required	R	Gr	Gr	-	-	-
		▪ Software system requirements specification (SWYRS)	--	-	-	R	Gr	-[13]

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			1, 2	3	4	1, 2	3	4
SOFT-DESIGN, 4	Design the software (design output)	▪ Software design outputs: ○ software specification (SWRS) ○ software design (SWDD) ○ Software system hazard analysis and mitigation documentation (SWHA; optional) ○ software design traceability documentation (SWTM) ○ SOFT-GEN deliverables ○ Other software design deliverables as required ○ Operations and maintenance (O&M) instructions ○ computer model mathematical terms[10]	R	Gr	Gr	R	Gr	-[13]
SOFT-DESIGN, 5	Translate the software design into computer program language (code)	▪ Computer program language (code): ○ data structures/files, ○ source code (where feasible), ○ executable code ▪ Computer program listings (e.g., pdf printout of source code)	R	Gr	Gr	R	Gr	Gr
SOFT-V&V, 4.1	Review (input) requirements	▪ Dispositioned review comments	R	Gr	Gr	R	Gr	Gr
SOFT-V&V, 5.1	Review acquisition	▪ Acquisition review document	-	-	-	R	R	-
SOFT-V&V, 5.2	Develop and review the test plan (SWTP)	▪ Test plan (e.g., Form 3055) ▪ Dispositioned review comments	R	Gr	Gr	R	Gr	Gr
SOFT-V&V, 4.3	Review the software design (SWDD)	▪ Software design ▪ Dispositioned review comments	R	Gr	Gr	R	Gr	Gr
SOFT-V&V, 4.4	Review computer program code where feasible	▪ Dispositioned code review comments	R	-	-	R	-	-

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			1, 2	3	4	1, 2	3	4
SOFT-V&V, 4.5	Test and review test results	▪ Interim tests and test (qualification) reports ▪ Simulated acceptance test and acceptance test report ▪ Acceptance test and test (qualification) report (SWTR) ▪ Dispositioned review comments	R	Gr	Gr	R	Gr	Gr
SOFT-V&V, 5.5	Review and approve software for use (SWAU)	▪ SWAU request package ▪ Dispositioned review comments ▪ Software approval for use form SOFT-V&V-FM01, SWAU	R	Gr	-	R	Gr	-
SOFT-MAINT, 3.1, 4.1	Use and maintain the software	▪ Operation and maintenance (O&M) documentation ▪ Operational event documentation ▪ Application logs ▪ Licenses and registrations ▪ Access controls ▪ Computer system vulnerability protections ▪ Problem reports and corrective actions per SOFT-GEN ▪ In-use test plans, tests, review documentation, and test reports per SOFT-V&V ▪ Updated, configuration management, SWDS and deliverables as described on SWDS and SWBL per SOFT-GEN ▪ Accurate software inventory per SOFT-INV ▪ Other quality assurance control documentation (e.g., training records, assessments)	R	Gr	Gr	R	Gr	Gr
SOFT-MAINT, 3.2, 4.2	Retire the software	▪ Software removed to prevent unintended or routine use ▪ Terminated licenses/agreements ▪ Updated software inventory ▪ Cancelled or revised affected documents ▪ Software record	R	R	R	R	R	R

Notes:

[1] ESM Chapter 21 section name and subsection number.

[2] See Form 2033 for software type and SRL. R = Required. Gr = Required but graded. "-" = Not required.

[3] For ML-4 SSC software, complete Form 2033 if there is a reasonable probability that it could be ML-1, ML-2, or ML-3 software, or if the highest function of the SSC is greater than ML-4. For Non-SSC ML-4, 2033 not required when "simple and easily understood" and each-time verified.

[4] See SOFT-GEN-FM02, *Software Baseline Form (SWBL)*; 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.

[5] 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.

[6] Required only for ML-1 or ML-2 nuclear safety software that is not procured from an NQA-1 qualified supplier.

[7] A PO or a Purchase Card (P-card) can be used for ML-4 software; a P-card cannot be used for ML-1 through ML-3 software.

[8] Required if the supplier comes onsite (at LANL) to install and/or maintain software.

[9] Required, or should be required, if software is acquired from LANL organizations, DOE sites or government agencies.

[10] Required for computer program models only.

[11] deleted

[12] For risk management, following Chapter 21 without specific attention to this is adequate for all but the most complex/critical designed software efforts.

[13] For "Simple and Easily Understood Non-SSC," designed, ML-4 software, the V&V may performed "each-time" by the associated calculation (e.g., per AP-341-605) rather than typical, pre-verified alternative.