

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

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

Rev. 1, 05/25/17

Table 21.1-ATT1 Chapter 21 Summary by Software Management Level (ML)								
This table is a summary only and does not include all requirement details. 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 (Also required for subcontractors working to compliant programs other than this chapter)	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	Develop and maintain a software baseline (SWBL)	Software baseline form SOFT-GEN-FM02 (SWBL) ⁴	R	R	-	R	R	-
SOFT-GEN, 4	Control software changes:							
	Less than minor change, minor and major changes made <u>before</u> or <u>after</u> software approval for use (SWAU)	Documented comment in the computer program where feasible	R	R	R	R	R	R
	Minor or major changes made <u>before</u> 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 <u>after</u> SWAU	SSC Software Change Form AP-341-507-FM01	R	Gr	-	-	-	-
Non-SSC Software Change Form SOFT-GEN-FM03 (SWNCP)		-	-	-	R	Gr	-	
SOFT-GEN, 5	Report problems and take corrective action:							
	Before SWAU	P330-6 , P322-4 , bug lists, documented comment field in the computer program	R	R	Gr	R	R	Gr
	After SWAU	P330-6 , P322-4 documents (e.g., Nonconformance Reports [NCRs])	R	R	Gr	R	R	Gr
SOFT-GEN, 6	Manage software (project) risks	Risk register (or list) as part of SWDS	R	R	- ¹²	R	R	- ¹²
SOFT-ACQUIRE, 3, 4	Acquire existing LANL software if suitable	Update authorized users/SWDS as required; generate an interface agreement where desired	-	-	-	R	R	Gr

1 Section SOFT-GEN: General Software Requirements

Rev. 1, 05/25/17

Table 21.1-ATT1 Chapter 21 Summary by Software Management Level (ML)								
This table is a summary only and does not include all requirement details. 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-ACQUIRE, 3, 4	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, 6	Develop software design requirements (input)	▪ Software design inputs: <ul style="list-style-type: none"> ○ SSC drawings ○ SSC performance specification ○ FDD or SDD 	R	Gr	Gr	-	-	-
		▪ Other SSC design inputs/outputs as required						
		▪ Software system requirements specification (SWYRS)	--	-	-	R	Gr	- ¹³
SOFT-DESIGN, 4, 7	Design the software (output)	▪ Software design outputs: <ul style="list-style-type: none"> ○ software specification (SWRS) ○ software design (SWDD) ○ software system hazard analysis and mitigation documentation (SWHA) ○ software design traceability documentation (SWTM) ○ SOFT-GEN deliverables ○ Other software design deliverables as required ○ Operations and maintenance (O&M) instructions ○ computer model mathematical terms¹⁰ 	R	Gr	Gr	R	Gr	- ¹³

1 Section SOFT-GEN: General Software Requirements

Rev. 1, 05/25/17

Table 21.1-ATT1 Chapter 21 Summary by Software Management Level (ML)								
This table is a summary only and does not include all requirement details. 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-DESIGN, 5, 8	Translate the software design into computer program language (code)	<ul style="list-style-type: none"> ▪ Computer program language (code): <ul style="list-style-type: none"> ○ 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	Review (input) requirements	<ul style="list-style-type: none"> ▪ Dispositioned review comments 	R	Gr	Gr	R	Gr	Gr
SOFT-V&V, 4	Review acquisition	<ul style="list-style-type: none"> ▪ Acquisition review document 	-	-	-	R	R	-
SOFT-V&V, 4	Develop and review the test plan (SWTP)	<ul style="list-style-type: none"> ▪ Test plan (e.g., Form 3055 (future)) ▪ Dispositioned review comments 	R	Gr	Gr	R	Gr	Gr
SOFT-V&V, 4	Review the software design (SWDD)	<ul style="list-style-type: none"> ▪ Software design ▪ Dispositioned review comments 	R	Gr	Gr	R	Gr	Gr
SOFT-V&V, 4	Review computer program code where feasible	<ul style="list-style-type: none"> ▪ Dispositioned code review comments 	R	-	-	R	-	-
SOFT-V&V, 4	Test and review test results	<ul style="list-style-type: none"> ▪ 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, 4	Review and approve software for use (SWAU)	<ul style="list-style-type: none"> ▪ SWAU request package ▪ Dispositioned review comments ▪ Software approval for use form SOFT-V&V-FM01, SWAU 	R	Gr	-	R	Gr	-
SOFT-INV, 3, 4	Inventory safety software	<ul style="list-style-type: none"> ▪ Updated institutional-level safety software inventory 	R	R ¹¹	-	R	R ¹¹	-
		<ul style="list-style-type: none"> ▪ ES-Div: Updated ES Non-SSC software inventory 	-	-	-	R	R ¹¹	-

1 Section SOFT-GEN: General Software Requirements

Rev. 1, 05/25/17

Table 21.1-ATT1 Chapter 21 Summary by Software Management Level (ML)								
This table is a summary only and does not include all requirement details. 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-INV, 3, 4	Inventory non-safety software	<ul style="list-style-type: none"> ▪ ES-Div: Updated ES non-SSC software inventory ▪ ES-Div: Form 2033 to ESSC 	-	-	-	R	R	R
SOFT-MAINT, 3, 4	Use and maintain the software	<ul style="list-style-type: none"> ▪ 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, 4	Retire the software	<ul style="list-style-type: none"> ▪ Software removed to prevent unintended or routine use ▪ Terminated licenses/agreements ▪ Updated software inventory(ies) ▪ 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 a crosswalk between MLs and software type, category and SRL. R = Required. Gr = Required but graded. “-” = Not required.

³ 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.

1 Section SOFT-GEN: General Software Requirements

Rev. 1, 05/25/17

- 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 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. See [P840-1](#) for details.
- ¹⁰ Required for computer program models only.
- ¹¹ Required if safety software.
- ¹² Following Chapter 21 provides adequate risk management.
- ¹³ May be addressed in associated software calculation.