



28 May 2010

U.S. Nuclear Regulatory Commission
Document Control Desk
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ATTENTION: To whom it may concern

SUBJECT: Rolls-Royce submittal of responses to NRC request for supplemental information

REFERENCES: (1) Project Number 0773: **SPINLINE 3** Digital Safety Instrumentation and Control Platform (TAC NO. ME1736)
(2) NRC Letter dated 14 May 2010, REQUEST FOR SUPPLEMENTAL INFORMATION RE: ROLLS ROYCE CIVIL NUCLEAR LICENSING TOPICAL REPORT, "SPINLINE 3 DIGITAL SAFETY I&C PLATFORM" (TAC NO. ME1736)

Rolls-Royce hereby submits the supplemental information requested by the U.S. Nuclear Regulatory Commission (NRC) in Reference 2.

Rolls-Royce notes that a common theme in the NRC questions relates to the difficulty in locating certain information that is expected in the software life cycle documentation for digital safety instrumentation and control (I&C) systems. This is a complicated matter, partly because the various governing documents take different approaches in defining what information is to be provided:

- IEEE 1074-1995 "provides the set of Activities that constitute the Processes that are mandatory for the development and maintenance of software....The standard does not require the completion of specific documents."
- IEEE 730-1998, IEEE 828-1998, and IEEE 1012-1998 provide format and content guidance for specific software life cycle plans (SQAP, SCMP, and SVVP, respectively).
- Draft Interim Staff Guide ISG-06, which is still in draft form, is intended to inform licensees of the information and documentation the NRC staff will need for its review of license amendment requests (LARs) for digital I&C upgrades and when the information should be provided. Rolls-Royce notes that our responses are based on the draft ISG-06 document submittal guidance for a Tier 3 review provided to Rolls-Royce by NRC in June 2009.

As part of its answers, Rolls-Royce is providing the following set of new tables that more clearly provide answers to the USNRC questions. One table summarizes how the **SPINLINE 3** documentation evolved from the original system documentation in the mid-1990s to the current generic platform documentation. Other tables document how the existing **SPINLINE 3** documentation aligns to the expectations set by IEEE 730-1998, IEEE 828-1998, IEEE 1012-1998, IEEE 1074-1995, and draft Interim Staff Guide ISG-06.



Table #	Table title	Purpose of the table
Table 1	Evolution of Selected SPINLINE 3 Software Life Cycle Documents	<p>This table identifies the key software life cycle documents for the following phases of SPINLINE 3 evolution:</p> <ul style="list-style-type: none"> • Used in the original MC3 project platform software project • Used in the 2000 SPINLINE 3 platform software upgrade project • Used in the 2001 SPINLINE 3 platform software upgrade project • Applicable to a future SPINLINE 3 platform software upgrade project • Applicable to a future SPINLINE 3 plant-specific application software project
Table 2	Alignment of IEEE 1074-1995 Activities, ISG-06 Tier 3 Document Guidance, and SPINLINE 3 Documents	<p>This table is a mapping of IEEE 1074-1995 software life cycle activities to the corresponding documents identified in Interim Staff Guide ISG-06 and to the Rolls-Royce licensing documents. This table attempts to harmonize two different views of what software documentation needs to be submitted to NRC and when the documents are due</p>
Table 3a	Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 730-1998 SQAP Content Guidance	<p>These tables map SPINLINE 3 documentation to the Software Quality Assurance Plan (SQAP) format and content guidance in IEEE 730-1998, Section 4. The three tables provide maps for three distinctly different phases of SPINLINE 3 development: (1) the development of the original platform software in the mid-1990s, (2) future modifications of the generic platform software, and (3) future development of plant-specific application software.</p>
Table 3b	Mapping SPINLINE 3 SMQP and Other Content to IEEE 730-1998 SQAP Content Guidance	
Table 3c	Mapping SPINLINE 3 Application SQAP and Other Content to IEEE 730-1998 SQAP Content Guidance	
Table 4a	Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 828-1998 SCMP Content Guidance	<p>These tables map SPINLINE 3 documentation to the Software Configuration Management Plan (SCMP) format and content guidance in IEEE 828-1998, Section 4. The three tables provide maps for three distinctly different phases of SPINLINE 3 development: (1) the development of the original platform software in the mid-1990s, (2) future modifications of the generic platform software, and (3) future development of plant-specific application software.</p>
Table 4b	Mapping SPINLINE 3 Platform SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance	
Table 4c	Mapping SPINLINE 3 Application SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance	
Table 5a	Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 1012-1998 SVVP Content Guidance	<p>These tables map SPINLINE 3 documentation to the Software Verification & Validation Plan (SVVP) format and content guidance in IEEE 1012-1998, Section 7. The three tables provide maps for three distinctly different phases of SPINLINE 3 development: (1) the development of the original platform software in the mid-1990s, (2) future modifications of the generic platform software, and (3) future development of plant-specific application software..</p>
Table 5b	Mapping SPINLINE 3 SMQP and Other Content to IEEE 1012-1998 SVVP Content Guidance	
Table 5c	Mapping SPINLINE 3 Application SVVP and Other Content to IEEE 1012-1998 SVVP Content Guidance	



Rolls-Royce believes that these tables and the previously submitted document 3 011 552 A, "Mapping of Generic **SPINLINE 3** Licensing Documents to the ISG-06 Submittal Guidance," demonstrate that appropriate software life cycle documents exist for the review and acceptance of the generic **SPINLINE 3** digital safety I&C platform:

- **SPINLINE 3** quality and software documentation addresses all applicable software life cycle activities identified in IEEE 1074-1995;
- **SPINLINE 3** quality and software documentation provides the content recommended in IEEE 730 (SQAP), IEEE 828 (SCMP), and IEEE 1012 (SVVP). However, the organization of this information is substantially different in the Rolls-Royce documents.
- All documentation identified in the draft ISG-06 for a Tier 3 review that is appropriate for a generic platform application and "required upon application" has been submitted to the NRC.
- Additional process details are available in lower tier documents that ISG-06 indicates are not required upon submittal, but are required to be submitted at least one year before the NRC review is scheduled to complete.

There are no gaps relative to the guidance in the above listed IEEE standards and ISG-06, which have to be interpreted for the case of a generic digital safety I&C platform application. Obviously, a few items in these standards and ISG-06 are applicable only in the case of an application for an actual plant-specific system. These items are indicated in the respective tables as being not applicable to a generic digital safety I&C platform application.

Recognizing that **SPINLINE 3** originally was designed and developed under a nuclear QA program that did not comply with 10CFR50 Appendix B, Rolls-Royce has elected to dedicate the generic **SPINLINE 3** digital safety I&C platform. As defined in 10CFR21, dedication is an acceptance process undertaken to provide reasonable assurance that a commercial grade item to be used as a basic component will perform its intended safety function and, in this respect, is deemed equivalent to an item designed and manufactured under a 10CFR50, Appendix B, quality assurance program. This assurance is achieved by identifying the critical characteristics of the item and verifying their acceptability by inspections, tests, or analyses. The dedication process must be conducted in accordance with the applicable provisions of 10CFR50, Appendix B. The process is considered complete when the item is designated for use as a basic component.

Rolls-Royce is the qualifier and dedicator of the generic **SPINLINE 3** digital safety I&C platform. Therefore, dedication is being performed under the 10CFR50 Appendix B-compliant quality program in the Meylan, France office, using the process defined in EPRI TR-106439, "Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications," and accepted by the NRC in an SER. This process is defined in and implemented in accordance with Rolls-Royce documents 3 010 794 A, "Dedication Plan for the Generic **SPINLINE 3** Digital Safety I&C Platform" and 8 307 288 A, "QA Procedure for Dedication," which have been submitted to NRC.

Completion of this dedication process is being aided by the comprehensive and traceable correspondence between the actual scope of **SPINLINE 3** software life cycle documents and the required scope of these documents as established in NRC regulatory requirements and documented in the attached tables and in the **SPINLINE 3** Licensing Topical Report (LTR) and other support licensing documents.



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Rolls-Royce commits to incorporating the enclosed supplementary information in the LTR and/or other appropriate documents. In addition Rolls-Royce commits to working with the NRC to identify which lower-tier documents are of greatest interest to NRC and then getting these documents translated and delivered to NRC as soon as practical after completion of the acceptance review.

This cover letter and the supplemental information described above are non-proprietary and will be submitted electronically.

Best regards,

A handwritten signature in blue ink, appearing to read 'JP Burel'.

Jean-Pierre Burel
Deputy Technical Director
Rolls-Royce Civil Nuclear SAS

**ROLLS-ROYCE RESPONSES TO REQUEST FOR SUPPLEMENTAL INFORMATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION**

***SPINLINE 3* DIGITAL SAFETY I&C PLATFORM, ROLLS ROYCE CIVIL NUCLEAR, PROJECT NO. 0773 (TAC NO. ME1736)**

NRC Questions	Rolls-Royce Responses
<p>By letters dated July 1, 2009, December 23, 2009, January 8, 2010, and February 2, 2010, Rolls Royce Civil Nuclear submitted licensing topical report, “<i>SPINLINE 3</i> Digital Safety I&C Platform,” for safety evaluation review by the U.S. Nuclear Regulatory Commission (NRC) staff. The NRC staff is performing an acceptance review of the submittal and has the following questions:</p>	<p>Rolls-Royce responses to the NRC questions are provided below.</p> <p>Rolls-Royce notes that a common theme in the NRC questions relates to the difficulty in locating certain information that is expected in the software life cycle documentation for digital safety instrumentation and control (I&C) systems. This is a complicated matter, partly because the various governing documents take different approaches in defining what information is to be provided.</p> <ul style="list-style-type: none"> • IEEE 1074-1995 “provides the set of Activities that constitute the Processes that are mandatory for the development and maintenance of software....The standard does not require the completion of specific documents.” • IEEE 730-1998, IEEE 828-1998, and IEEE 1012-1998 provide format and content guidance for specific software life cycle plans (SQAP, SCMP, and SVVP, respectively). • Draft Interim Staff Guide ISG-06 is intended to inform licensees of the information and documentation the NRC staff will need for its review of license amendment requests (LARs) for digital instrumentation and control (I&C) upgrades and when the information should be provided. <p>As part of its answers, Rolls-Royce is providing a set of new tables that more clearly define: (1) how the <i>SPINLINE 3</i> documentation evolved from the original system documentation in the mid-1990s to the current generic platform documentation, and (2) how this body of documentation aligns to the expectations set by IEEE 730-1998, IEEE 828-1998, IEEE 1012-1998, IEEE 1074-1995 and draft Interim Staff Guide ISG-06. These new tables are identified in the following responses to the NRC questions.</p>

NRC Questions	Rolls-Royce Responses
<p>1 NRC Regulatory Guide (RG) 1.168, "Verification, Validation, Reviews, and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants," Revision 1, endorses Institute of Electrical and Electronic Engineers (IEEE) Standard (Std) 1012-1998, "IEEE Standard for Software Verification and Validation," for meeting the regulatory guidance for software verification and validation. The Interim Staff Guidance (ISG)-06 compliance matrix (ADAMS Accession No. ML100640485) indicated that the "SPINLINE 3 Software Validation Test Plan" (SVTP), Doc. No. 1 207 146 G (ADAMS Accession No. ML100330844) is the software verification and validation plan (SVVP) for the platform. However, the SVTP does not address all of the topics that are supposed to be addressed by an SVVP. For example, IEEE 1012 states that an SVVP should address: verification and validation (V&V) overview, V&V processes (only one of which might be testing, as not all attributes are testable), V&V administrative requirements and V&V documentation requirements. The SVTP addresses analysis of software functions, test resources, analysis of tests, coverage of tests, regression tests, and tests on upgrades, as would be expected in a test plan. However, the SVTP does not address V&V overview, V&V processes (other than testing), V&V administrative requirements and V&V documentation requirements. For example: (See 1A and 1B, below)</p>	<p><u>Location of V&V process guidance:</u> The original development of SPINLINE 3 was done in the mid-1990s in accordance with European standards for safety software life cycle processes, the primary one being IEC 880-1986. At that time, the function of the SVVP was performed by the MC3 Software Quality Plan (SQP, document 8 303 429 E) supplemented by the SVTP (document 1 207 146G) and subordinate instructions. There was no separate SVVP.</p> <p>The V&V content of the MC3 SQP is based on the V&V requirements in IEC 880-1986 Chapter 6 "Verification" and Chapter 8 "Validation". Refer to the V-process diagram in Section 5.1 of the MC3 SQP to see how verification and validation were integrated into the original software development life cycle for the SPINLINE 3 platform software. This diagram is reproduced in the LTR as Figure 6.2-1 and is discussed in LTR §6.2.1. Table 3.10-2 of the LTR provides a mapping that summarizes how development of the generic SPINLINE 3 platform complied with IEC 880-1986. This standard does not have the full level of detail currently found in IEEE 1012-1998.</p> <p>Because there are differences between European and U.S. nuclear safety regulatory requirements, Rolls-Royce is dedicating the generic SPINLINE 3 platform, without changing the underlying platform software documentation. The Design Analysis Report (document number MPR-3337 Rev 1, which has been submitted to NRC) documents the results of a review of the differences between the software life cycle practices used to create the generic SPINLINE 3 platform software in the mid-1990s and NRC's current recommended software life cycle practices. No gaps were identified in the software life cycle processes employed by Rolls-Royce for SPINLINE 3.</p> <p>To help clarify this matter, Rolls-Royce is submitting herewith a set of tables to more clearly define: (1) how the SPINLINE 3 documentation evolved from the original system documentation in the mid-1990s to the current generic platform documentation, and (2) how this body of documentation aligns to the expectations set by IEEE 1012-1998.</p>

NRC Questions	Rolls-Royce Responses
	<p>Table 1 shows the evolution of selected SPINLINE 3 software life cycle documents from the original MC3 project mid-1990s to future platform software modification projects and plant-specific application software projects. Documents that have been submitted to the NRC are indicated in this table.</p> <p>Tables 5a, 5b, and 5c provide maps that show where the SVVP content identified in §7 of IEEE 1012-1998 is found in SPINLINE 3 software life cycle documents for the following three cases: (1) the original MC3 project that created the SPINLINE 3 platform software, (2) future SPINLINE 3 platform software modification projects, and (3) future plant-specific application software projects.</p> <ul style="list-style-type: none"> • Table 5a: Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 1012-1998 SVVP Content Guidance • Table 5b: Mapping SPINLINE 3 SMQP and Other Content to IEEE 1012-1998 SVVP Content Guidance • Table 5c: Mapping SPINLINE 3 Application SVVP and Other Content to IEEE 1012-1998 SVVP Content Guidance <p>Documents that have been submitted to the NRC are indicated in these tables.</p> <p>Rolls-Royce believes Tables 5a to 5c demonstrate that there are no gaps between the V&V guidance provided in SPINLINE 3 software life cycle documentation and the corresponding content guidance in IEEE 1012-1998, which has to be interpreted for the case of a generic digital safety I&C platform application. Obviously, there are a few items in IEEE 1012-1998 that apply only in the case of an actual plant-specific system. These items are indicated in the respective tables as being not applicable in the case of a generic digital safety I&C platform.</p> <p>The differences between the organization of the V&V guidance in the Rolls-Royce software life cycle documents and IEEE 1012-1998 should be acceptable.</p>

NRC Questions		Rolls-Royce Responses
		<p>Applying the guidance in ISG-06, Rolls-Royce further believes that all V&V documents required upon submittal have been submitted to NRC. Additional V&V process details are available in lower tier documents that ISG-06 indicates are not required upon submittal, but are required within one year of the completion of the NRC review.</p> <p>Rolls-Royce commits to working with the NRC to identify which lower-tier documents are of greatest interest to NRC and then getting these documents translated and delivered to NRC as soon as practical after completion of the Acceptance Review.</p> <p>Rolls-Royce commits to updating the LTR after the Acceptance Review to include Tables 1, 5a, 5b and 5c.</p> <p><u>V&V Overview:</u> See 1a, below.</p> <p><u>V&V Process (other than testing):</u> See 1b, below.</p> <p><u>V&V administrative requirements:</u> See 1b, below.</p> <p><u>V&V documentation requirements:</u> See 1b, below.</p>
1a	<p>Clause 7.4, "V&V Overview," of IEEE 1012 states: "The SVVP shall describe the organization, schedule, software integrity level scheme, resources, responsibilities, tools, techniques, and methods necessary to perform the software V&V." Clause 7.4.1, "(SVVP Section 4.1) Organization," of IEEE 1012 further states: "The SVVP shall describe the organization of the V&V effort, including the degree of independence required (See Annex C of this standard). The SVVP shall describe the relationship of the V&V processes to other processes such as development, project management, quality assurance, and configuration management. The SVVP shall describe the lines of communication within the V&V effort, the authority for resolving issues raised by V&V tasks, and the authority for approving V&V</p>	<p>Refer to Tables 5a, 5b, and 5c to see where the IEEE 1012-1998 recommended SVVP content is found in <i>SPINLINE 3</i> software life cycle documents.</p> <p>Additional specific responses to the points raised in Item 1a are provided below:</p> <p><u>Lines of communication within the V&V effort:</u> The overall management structure for the original development of <i>SPINLINE 3</i> is shown in §4.1 of the MC3 Software Quality Plan (SQP, document 8 303 429 E) and duties and responsibilities of the software team are described in §4.3 of that document.</p>

NRC Questions	Rolls-Royce Responses
<p>products. Annex F provides an example organizational relationship chart"; whereas, the STVP, being focused on testing, does not address these topics.</p>	<p>The overall management structure for a modification of SPINLINE 3 platform software is described in §4.1 of the Software Modification Quality Plan (SMQP), document 1 208 686 B. Key points are the following:</p> <ul style="list-style-type: none"> • The SPINLINE 3 Software Modification Project Manager (SPM) is responsible for coordinating with the safety software Verification & Validation team. • The Verification & Validation Manager (VVM) is responsible for all V&V activities associated with safety software. • V&V activities are defined in Instruction 1 207 107, "Rules for Verification & Validation of safety class software components" • Process interfaces between the software project team and the independent V&V team are described in §8 of the SMQP <p><u>Authorities for resolving issues raised by V&V tasks:</u> As stated in §4 of the SMQP, the Verification & Validation Manager (VVM) is responsible for all V&V activities associated with safety software". The VVM has the needed authority.</p> <p><u>Authority for approving V&V products:</u> The Verification & Validation Manager (VVM) has this authority.</p> <p><u>Organizational relationship chart:</u> The organization chart for the original development of SPINLINE 3 is shown in §4.1 of the MC3 Software Quality Plan (SQP, document 8 303 429 E).</p> <p>The project organization for each specific platform software modification campaign is described in the SDP that is created for that software project. A typical organization chart is described in Rolls-Royce document 8 303 350 F, "Safety Software Design Process" [PRO_Concept_log_C].</p>
<p>1b</p> <p>Clause 7.5, "(SVVP Section 5) V&V Processes," of IEEE 1012 states: "The SVVP shall identify V&V activities and tasks to be performed for each of the V&V processes described in Clause 5 of this standard, and shall document those V&V activities and tasks. The SVVP shall contain an overview of the V&V activities</p>	<p>Refer to Tables 5a, 5b, and 5c to see where the IEEE 1012-1998 recommended SVVP content is found in SPINLINE 3 software life cycle documents.</p>

NRC Questions	Rolls-Royce Responses
<p>and tasks for all software life cycle processes."</p> <p>Clause 5 of IEEE 1012 states: "V&V processes support the management process (5.1), acquisition process (5.2), supply process (5.3), development process (5.4), operation process (5.5), and maintenance process (5.6). The minimum V&V activities and tasks supporting the above processes are referenced in the following subclauses and defined in Table 1. This clause's subtitles are the same as subtitles in Table 1 to correlate the requirements of the following subclauses with Table 1 tasks."</p> <p>Clause 7.5.1, "(SVVP Sections 5.1 through 5.6) Software life cycle," further states:</p> <p>"The SVVP shall include sections 5.1 through 5.6 for V&V activities and tasks as shown in SVVP Outline (boxed text). The SVVP shall address the following eight topics for each V&V activity</p> <ol style="list-style-type: none"> 1) <i>V&V Tasks</i>. The SVVP shall identify the V&V tasks to be performed. Table 1 describes the minimum V&V tasks, task criteria, and required inputs and outputs. Table 2 specifies the minimum V&V tasks that shall be performed for each software integrity level. 2) <i>Methods and Procedures</i>. The SVVP shall describe the methods and procedures for each task, including on-line access, and conditions for observation/evaluation of development processes. The SVVP shall define the criteria for evaluating the task results. 3) <i>Inputs</i>. The SVVP shall identify the required inputs for each V&V task. The SVVP shall specify the source and format of each input. The inputs required for the minimum V&V tasks are identified in Table 1. Other inputs may be used. For any V&V activity and task, all of the required inputs from preceding activities and tasks may be used but for conciseness, only the primary inputs are listed in Table 1. 	<p>Additional specific responses to the points raised in Item 1b are provided below:</p> <p><u>Methods and procedures (Clause 5.1):</u> For the original development of SPINLINE 3, refer to the MC3 SQP, §9 "Methods, Tools and Rules". Additional guidance is provided in Rolls-Royce document 1 207 107, "Rules for Verification/Validation of Software Components", which is referenced in MC3 SQP, §9.3</p> <p>For a modification of SPINLINE 3 platform software, refer to the SMQP, §8, "Methods, Procedures and Rules", for a phase-by-phase description of the activities of the software project team and its interfaces with the independent V&V team. Additional guidance is provided in §12 of Rolls-Royce technical instruction 8 303 350 J, "Safety Software Design Process" [PRO_Concept_log_C]. This document is referenced in SMQP, §8.1.</p> <p><u>V&V reporting requirements (Clause 7.6):</u> For the original development of SPINLINE 3, phase-by-phase inputs and outputs (reports, including V&V reports) are defined in the MC3 SQP, §5, "Quality Control in the Design and Production of Software". Further guidance is provided in §6, "Documentation".</p> <p>Additional guidance on V&V reporting requirements are defined §12 of Instruction 1 207 107, "Rules for Verification & Validation of Safety Class Software Components." .</p> <p><u>V&V administrative requirements (Clause 7.7):</u> Basic V&V and related documentation administrative requirements are addressed in MC3 SQP, §5 and 6. More details are provided in Instruction 1 207 107, "Rules for Verification & Validation of Safety Class Software Components."</p> <p><u>V&V documentation requirements (Clause 7.8):</u> Basic approval authorities for V&V documentation are defined in MC3 SQP, § 6. Additional V&V documentation requirements are defined §12 of Instruction 1 207 107, "Rules for Verification & Validation of Safety Class Software Components."</p>

NRC Questions		Rolls-Royce Responses
	<p>4) <i>Outputs.</i> The SVVP shall identify the required outputs from each V&V task. The SVVP shall specify the purpose, format, and recipients of each output. The required outputs from each of the V&V tasks are identified in Table 1. Other outputs may be produced. The outputs of the Management of V&V and of the V&V tasks shall become inputs to subsequent processes and activities, as appropriate.</p> <p>5) <i>Schedule.</i> The SVVP shall describe the schedule for the V&V tasks. The SVVP shall establish specific milestones for initiating and completing each task, for the receipt and criteria of each input, and for the delivery of each output.</p> <p>6) <i>Resources.</i> The SVVP shall identify the resources for the performance of the V&V tasks. The SVVP shall specify resources by category (e.g., staffing, equipment, facilities, travel and training).</p> <p>7) <i>Risks and Assumptions.</i> The SVVP shall identify the risks (e.g., schedule, resources, or technical approach) and assumptions associated with the V&V tasks. The SVVP shall provide recommendations to eliminate, reduce, or mitigate risks.</p> <p>8) <i>Roles and Responsibilities.</i> The SVVP shall identify the organizational elements or individuals responsible for performing the V&V tasks;"</p> <p>whereas, the SVTP does not address all of these topics, and for those it generally addresses (e.g., methods and procedures), they are addressed in a limited manner as they concern only testing. Similarly, under V&V reporting requirements (Clause 7.6), V&V administrative requirements (Clause 7.7) and V&V documentation requirements (Clause 7.8), IEEE 1012 contains extensive detailed guidance that it states shall be in an SVVP; whereas, the SVTP does not address these topics for all V&V activities.</p>	<p><u>Topics 5) Schedule, 6) Resources & 7) Risk:</u> It is Rolls-Royce practice to put schedule, resources, and risk details in the SDP for each software project. For example, for the original MC3 project, this information can be found in document 1 207 102 A, "Software Development Plan - MC3".</p>
2	RG 1.173, "Developing Software Life Cycle Processes for Digital Computer Software Used in Safety Systems of Nuclear Power	To aid in responding to this question, Rolls-Royce prepared Table 2, which is a mapping of IEEE 1074-1995 software life cycle activities to

NRC Questions	Rolls-Royce Responses
<p>Plants," endorses IEEE Std 1074-1995, "IEEE Standard for Developing Software Life Cycle Processes," as providing an approach acceptable to the staff, for meeting the regulatory requirements and guidance as they apply to development processes for safety system software.</p>	<p>the corresponding documents identified in the NRC's Interim Staff Guide ISG-06 and to the Rolls-Royce licensing documents. This table attempts to harmonize two different views of what software documentation needs to be submitted to NRC and when the documents are due:</p> <ul style="list-style-type: none"> • IEEE 1074-1995 identifies activities and processes that need to be addressed in software life cycle documentation, but it does not prescribe what documents must be prepared. • ISG-06 provides a listing of documents to be submitted to NRC in connection with a License Amendment Request and indicates which documents are: (a) required upon application, (b) required within one year of the completion of the NRC review, and (c) available for audit. <p>Documents that have been submitted to the NRC are indicated in Table 2.</p> <p>Rolls-Royce believes that Table 2 demonstrates that appropriate software life cycle documents exist for all activities identified in IEEE 1074-1995. There are no gaps relative to the guidance in IEEE 1074-1995, which has to be interpreted for the case of a generic digital safety I&C platform application. Obviously, there are a few items in IEEE 1074-1995 that apply only in the case of an actual plant-specific system. These items are indicated in Table 2 as being not applicable in the case of a generic digital safety I&C platform.</p> <p>Applying the guidance in ISG-06, Rolls-Royce further believes that all software life cycle documents required upon submittal have been submitted to NRC. Additional process details are available in lower tier documents that ISG-06 indicates are not required upon submittal, but are required within one year of the completion of the NRC review.</p> <p>Rolls-Royce commits to working with the NRC to identify which lower-tier documents are of greatest interest to NRC and then getting these documents translated and delivered to NRC as soon as practical after completion of the Acceptance Review.</p>

NRC Questions		Rolls-Royce Responses
		Rolls-Royce commits to updating the LTR after the Acceptance Review to include Table 2.
2a	The platform software development plan (platform SDP), "Software Development Plan," Doc. No. 1 207 102 A (ADAMS Accession No. ML 093620283), is mainly a structural plan prescribing who does what and when, as called for by IEEE 1074, but with much less detail. It implies that the details are contained in a document called [CCGL_MC3]. Please provide documentation that includes a level of detail comparable to that in IEEE 1074.	<p><u>Document [CCGL_MC3]:</u> Referenced document [CCGL_MC3] is the "General Specifications for MC3 Software", document 1 207 101 (see SDP §1.3). This document has not been provided to NRC and does not provide the details requested.</p> <p>Rolls-Royce previously provided "Software Requirement Specification - Operational System Software", document 1 207 108 J, which is the appropriate SRS for SPINLINE 3.</p> <p><u>SDP level of detail:</u> The Software Development Plan in question (SDP, document 1 207 102 A) is the SDP prepared in the 1990s to govern the development of SPINLINE 3. It is a historical document that is not in current use.</p> <p>Refer to Table 2 to identify the lower-tier software QA procedures that provide additional guidance on the software life cycle activities allocated to the SDP.</p>
2b	The platform SDP contains detail regarding the development process, responsibility distribution and risk analysis. However, there are some things called for by IEEE 1074 that are missing. For example: metric development and analysis and resource estimation. Also omitted was a discussion of quality, except for a reference to a document called [PAQL_MC3]. Please provide information on how documents to be used in future platform software development cover the omitted topics.	<p><u>Where certain software life cycle activities are addressed:</u> The MC3 Software Quality Plan (SQP, document 8 303 429 E), was first issued in November 1993, and was based on the European standards AFNOR NFZ 67-130 and IEC 880-1986, not on IEEE 730. The Software Development Plan (SDP, document 1 207 102 A) is the SDP prepared in the 1990s to govern the development of SPINLINE 3. These are historical document that are not in current use. English translations of these documents have been provided to NRC.</p> <p>The Rolls-Royce Software Modification Quality Plan (SMQP, document 1 208 686 B) is the current SQAP governing modification of the generic platform software. When modifications to the generic platform software are required, a Software Development Plan will be prepared for that specific scope of work. As explained in Section 5.1 of document 1 208 686 B, "The software development plan is the document governing cost and schedule control processes. It</p>

NRC Questions	Rolls-Royce Responses
	<p>describes how it is planned to run the project and indicates the resources required in accordance with the Software Project Management Process Instruction [IL_Gest_Proj], document 1 208 055 D.</p> <p><u>Metric development and analysis:</u> Metric development is a basic QA process that is addressed in § 8.2 of the Rolls-Royce Civil Nuclear SAS Quality Manual (former SES department Quality Assurance Manual), document 8 303 186 P. This document has been submitted to NRC.</p> <p>Metrics are developed on a project-specific basis and periodic project reviews are conducted to track project performance relative to the selected metrics. This process is described in instruction, "Software Instruction: Software Project Management Process", [IL_Gest_Proj], document 1 208 055 D</p> <p>Additional guidance on indicators (metrics) is provided in instruction, "Process for Control of Quality" [IL_Proc_Qual], document 8 303 634 D.</p> <p><u>Resource estimation:</u> It is Rolls-Royce practice to include the resource information (labor budget, equipment, and facilities) in the Software Development Plan (SDP), which is created for a specified scope of work. The labor budget is not defined in terms of cost, but rather in terms of labor categories and person-hours per labor category. Cost information, including labor rates, is sensitive information and is managed separately from the SDP. The SDP for the original development of SPINLINE 3 is document 1 207 102 A, dated June 1994. An English translation of this historical document was submitted to NRC in December 2009 with the actual labor budget and other resource information redacted in Sections 6 and 7. Further guidance on resource management is provided in QA procedure, "Resources Management Process", document 8 303 696.</p> <p><u>Discussion of quality:</u> Document [PAQL_MC3] is "Software Quality Plan (SQP) - MC3", document 8 303 429 E, which has been submitted to NRC. It is</p>

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		<p>Rolls-Royce practice to make reference to another Plan or guidance document rather than repeating the guidance in a companion document. This simplifies document configuration management throughout the document life cycle.</p> <p><u>How documents for future platform software development address the above topics:</u> As noted above, the Rolls-Royce Software Modification Quality Plan (document 1 208 686 B) is the current SQAP governing modification of the generic platform software.</p>
3	Risk Management is not addressed. Please provide risk management information.	Rolls-Royce commits to updating the LTR after the Acceptance Review to include the descriptions of risk management activities in Items 3a and 3b, below.
3a	RG 1.152, Revision 2, "Criteria for Use of Computers in Safety Systems of Nuclear Power Plants," endorses IEEE Std 7-4.3.2-2003, "Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations." IEEE 7-4.3.2 Clause 5.3.6, "Software Project Risk Management," calls for software risk management. However, the platform software quality plan (platform SQP), Doc. No. 8 303 429 E (ADAMS Accession No. ML093620244), contains no provision for risk analysis or control. Please provide risk analysis/management information or explain how this was accomplished during platform software development.	<p>A summary risk assessment for the original development of the generic <i>SPINLINE 3</i> platform software and hardware can be found in §8 of the MC3 SDP (document 1 207 102A).</p> <p>For the generic platform software, also refer to the Rolls-Royce document, "<i>SPINLINE 3</i> Safety of Processing Unit Software" (document number 1 207 228 H), which was submitted to NRC in December 2009. This safety analysis can be used to support future risk assessments for plant-specific use of <i>SPINLINE 3</i>.</p>
3b	IEEE 1012, Table I, Clause 5.6.1, Item 8, states: "Review and update risk analysis using prior task reports. Provide recommendations to eliminate reduce or mitigate the risks." The Software Modification Quality Plan (SMQP), Doc No. 1 208 686 B (ML093620234), Section 5.2.1, discusses "impact on existing systems" under "General Impact Assessment," but there is no indication of a detailed risk analysis or mitigation plan. Please provide documentation that includes a detailed risk analysis or mitigation plan.	<p><u>Risk management:</u> Risk management is integrated with basic quality management system processes. For example:</p> <p>The top-level quality plan is, "Rolls-Royce Civil Nuclear SAS Quality Manual", document 8 303 186 P, which has been provided to NRC. Risk management activities are addressed in the following sections: § 4.2.4, 5.3, 7.0, 7.4.1, 7.5.5, and 8.5.3.</p> <p>The SMQP, document 1 208 686 B, applies to future changes to the baseline generic platform. As the future changes are being planned, an SDP and appropriate risk management activities will be defined, consistent with the scope of the planned changes.</p>

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		<p>Risk management is addressed during the phase reviews described in §11.1.1 of the SMQP:</p> <ul style="list-style-type: none"> • “Upgrade campaign start review”: one of the purposes of this review is to reach “agreement on risk assessment and measures to control associated risks” during the modification project • The risk assessment is updated as part of the “Component end-of-upgrade review” and the “Delivery review”. <p>For application software, risk management is addressed in the following software life cycle plans:</p> <ul style="list-style-type: none"> • §14 of “SPINLINE 3 Software Quality Assurance Plan – SQAP”, document 8 307 208 B • §7 of “SPINLINE 3 Software Development Plan - SDP”, document 8 307 211 B • §3.7 of “SPINLINE 3 Software Verification and Validation Plan – SVVP”, document 8 307 210 B • §4 of “System Integration and Factory Test Plan”, document 8 307 245 A • §4 of “System Installation and Site Test Plan”, document 8 307 243 A • §4 of “System Training Plan”, document 8 307 242 A • §4 of “System Operations and Maintenance Plan”, document 8 307 244 A <p>Some additional guidance on risk management is provided in Rolls-Royce instruction, “Software Instruction: Software Project Management Process” [IL_Gest_Proj], document 1 208 055 D.</p>
4 Para 1	RG 1.169, "Configuration Management Plans for Digital Computer Software Used in Safety Systems of Nuclear Power Plants," endorses IEEE Std 828-1998, "IEEE Standard for Software Configuration Management Plans," for software configuration management plans. The platform software configuration management plan (platform SCMP) is "Software Configuration Management Plan for SPINLINE 3 Software Sub-assemblies Managed by CM Tool," Doc. No. 1 208 878 D	<p><u>Management of CM activities:</u></p> <p>The original development of SPINLINE 3 was done in the mid-1990s in accordance with European standards for safety software life cycle processes, the primary one being IEC 880-1986. At that time, the function of the SCMP was performed by the MC3 Software Quality Plan (SQP, document 8 303 429 E) supplemented by instructions. There was no separate SCMP.</p>

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<p>(ADAMS Accession No. ML093620238). The technical process in this document is described in detail, but virtually all of the management pieces are missing completely. Please provide documentation that includes the management pieces.</p>	<p>As shown in Table 1, SCMP, document 1 208 878, has been used in one SPINLINE 3 platform software modification project. The current version is document 1 208 878 D. As described in SCMP §2.1 & 2.9, details on software configuration management are provided in instruction, “Software Configuration Management Process” [IL_Gest_Conf], document 1 207 875 F. Additional management details are in the Software Configuration Management Report and List of Document for each software component (CSS, BF, LDU, ...).</p> <p>To help clarify this matter, Rolls-Royce is submitting herewith a set of tables to better explain the relationships of its software life cycle documents to the SCMP format and content guidance in IEEE 828-1998.</p> <p>Tables 4a, 4b, and 4c provide maps that show where the IEEE 828 SCMP content is found in SPINLINE 3 software life cycle documents for three cases: (1) the original MC3 project that created the SPINLINE 3 platform software, (2) future SPINLINE 3 platform software modification projects, and (3) future plant-specific application software projects.</p> <ul style="list-style-type: none"> • Table 4a: Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 828-1998 SCMP Content Guidance • Table 4b: Mapping SPINLINE 3 Platform SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance • Table 4c: Mapping SPINLINE 3 Application SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance <p>Documents that have been submitted to the NRC are indicated in these tables.</p> <p>Rolls-Royce believes Tables 4a to 4c demonstrate that there are no gaps between the configuration management guidance provided in SPINLINE 3 software life cycle documentation and the corresponding content guidance in IEEE 828-1998, which has to be interpreted for the case of a generic digital safety I&C platform application. Obviously, there are a few items in IEEE 828-1998 that apply only in the case of an actual plant-specific system. These items are</p>

NRC Questions		Rolls-Royce Responses
		<p>indicated in the respective tables as being not applicable in the case of a generic digital safety I&C platform.</p> <p>The differences between the organization of the SCMP guidance in the Rolls-Royce software life cycle documents and IEEE 828-1998 should be acceptable.</p> <p>Applying the guidance in ISG-06, Rolls-Royce further believes that all CM documents required upon submittal have been submitted to NRC. Additional CM process details are available in lower tier documents that ISG-06 indicates are not required upon submittal, but are required within one year of the completion of the NRC review.</p> <p>Rolls-Royce commits to working with the NRC to identify which lower-tier documents are of greatest interest to NRC and then getting these documents translated and delivered to NRC as soon as practical after completion of the Acceptance Review.</p> <p>Rolls-Royce commits to updating the LTR after the Acceptance Review to include Tables 4a, 4b and 4c.</p>
4 Para 2-1	The platform SCMP was very difficult to follow. The translation into English from French is challenging to comprehend.	<p><u>Quality of SCMP translation:</u> Rolls-Royce will review the translation to English and determine where the translation can be improved. An updated version of document 1 208 878 D will be issued after completion of the Acceptance Review.</p>
4 Para 2-2	Configuration management software was apparently used for some of it, but not all.	<p><u>Use of software CM tool:</u> The configuration management software tool Dimensions is used for all of the software listed in §1.2.2 of SCMP, document 1 208 878 D.</p> <p>The only software that is not managed in Dimensions is the embedded software for the ICTO board, which is managed using the GVL tool on the VAX.</p>
4 Para 2-3	There is no detail at all regarding V&V, except for mentioning that V&V is done before changes are approved	<p><u>Reference in the CM Plan to V&V activities:</u> The SCMP addresses CM activities performed by the software project team. V&V is performed by an independent team. As described in Item 1, above, V&V team activities are governed by separate procedures. This V&V guidance is not appropriate content for the SCMP. IEEE 828-1998, § 4, does not identify any V&V</p>

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		content in the SCMP outline.
4 Para 2-4	There is no mention of the parties responsible for management of the various pieces of the process.	<u>CM roles and responsibilities:</u> See 4.a, below.
4 Para 2-5	IEEE 828 calls for processes for interface control, resources or V&V and none of these is addressed in this document. There was no reference to external documents for those processes.	See 4.d, below, regarding interface management See 2.b, above, regarding resource management See 4 Para 2-3, above, regarding V&V Refer to Tables 4a, 4b and 4c for the complete mapping of external documents referenced in the SCMP. Rolls-Royce will review the references to external documents in the SCMP and add references that are needed.
4 Para 3	The platform software has already been developed, and as such, would not necessarily be expected to claim compliance with newer process documents. However, it is difficult to reach a conclusion about the quality of the platform development process. Please provide documents that show the process is in compliance with NRC endorsed standards. Some of these omissions are addressed in software modification quality plan (SMQP), but those sections are not referenced in this document. For example:	Recognizing that SPINLINE 3 originally was designed and developed under a nuclear QA program that did not comply with 10CFR50 Appendix B, Rolls-Royce has elected to dedicate the generic SPINLINE 3 digital safety I&C platform. As defined in 10CFR21, dedication is an acceptance process undertaken to provide reasonable assurance that a commercial grade item to be used as a basic component will perform its intended safety function and, in this respect, is deemed equivalent to an item designed and manufactured under a 10CFR50, Appendix B, quality assurance program. This assurance is achieved by identifying the critical characteristics of the item and verifying their acceptability by inspections, tests, or analyses. The dedication process must be conducted in accordance with the applicable provisions of 10CFR50, Appendix B. The process is considered complete when the item is designated for use as a basic component. Rolls-Royce is the qualifier and dedicator of the generic SPINLINE 3 digital safety I&C platform. Therefore, dedication is being performed under the 10CFR50 Appendix B-compliant quality program in the Meylan, France office, using the process defined in EPRI TR-106439, "Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications," and accepted by the NRC in an SER. This process is defined in and implemented in

NRC Questions		Rolls-Royce Responses
		<p>accordance with Rolls-Royce documents 3 010 794 A, "Dedication Plan for the Generic SPINLINE 3 Digital Safety I&C Platform" and 8 307 288 A, "QA Procedure for Dedication," which have been submitted to NRC.</p> <p>Completion of this dedication process is being aided by the comprehensive and traceable correspondence between the actual scope of SPINLINE 3 software life cycle documents and the required scope of these documents as established in NRC regulatory requirements and documented in the attached tables and in the SPINLINE 3 Licensing Topical Report (LTR) and other support licensing documents.</p>
4a	<p>IEEE 828, Clause 4.2.1, states: "The organizational context, both technical and managerial, within which the planned SCM activities are to be implemented, shall be described." However, the platform SCMP does not describe the organizational, management or authority context for configuration management. This is very significant, because without structured oversight of the process, there is little hope of proper implementation of the process</p>	<p>CM roles and responsibilities The overall management structure for a modification of SPINLINE 3 platform software is described in §4 of SMQP, document 1 208 686 B, which in §7 references the following documents as the sources of guidance for CM activities:</p> <ul style="list-style-type: none"> • [PGCL_SPINLINE 3], "SPINLINE 3 Software Configuration Management Plan", document 1 208 878 D. • [IL_Gest_Conf], "Software Configuration Management Process", document 1 207 875 F. <p>CM duties and responsibilities are defined in 1 207 875 F.</p> <p>Rolls-Royce commits to working with the NRC to identify which lower-tier documents are of greatest interest to NRC and then getting these documents translated and delivered to NRC as soon as practical after completion of the Acceptance Review.</p>
4b	<p>IEEE 828, Clause 4.3.2.1, states: "The plan shall specify procedures for requesting a change to a baselined CI [configuration item] and the information to be documented for the request." However, the platform SCMP does not specify the procedures for requesting a change to a baselined CI. This is significant, because without a detailed process for change requests, it is impossible to be sure sufficient information is available to do proper risk analysis, scheduling, and V&V planning.</p>	<p>Procedures for requesting a software change: Software changes are managed using standard procedures, as described in §2.7 of the SCMP.</p> <p>More details for requesting a change to the software baseline are contained in [IL_Gest_Conf], "Software Configuration Management Process", document 1 207 875 F. This document is referenced in SCMP §2.1 & 2.9</p>

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		Refer to Table 4b for a complete mapping of Rolls-Royce configuration management guidance to the content guidance in IEEE 828.
4c	IEEE 828, Clause 4.3.4, states: "The plan shall identify the configuration audits and reviews to be held for the project." However, the platform SCMP does not specify an audit or review process. This is important because configuration reviews are important management tools for establishing a baseline.	<p><u>CM reviews and/or audits:</u> The <i>SPINLINE 3</i> software modification process is described in §5.2 of the SMQP, document 1 208 686 B. The figure in §5.2.1 shows the key reviews that take place during a software modification project.</p> <p>More details for conducting configuration audits are contained in [IL_Gest_Conf], "Software Configuration Management Process", document 1 207 875 F.</p> <p>Refer to Table 4b for a complete mapping of Rolls-Royce configuration management guidance to the content guidance in IEEE 828.</p>
4d	IEEE 828, Clause 4.3.4, states: "The Plan shall identify the external items to which the project software interfaces." However, the platform SCMP has no provisions to ensure that external interfaces are identified. This is important because the effects of external hardware or support software on a given CI might not be properly analyzed.	<p><u>Managing external interfaces:</u> The application software is the primary "external software interface" that needs to be managed on each plant-specific project. This external interface is managed in accordance with "Interface Specifications - Operational System Software and Application Software", document 1 207 110 J, which has been submitted to NRC.</p> <p>When these interface specifications are met, then no software change is needed in the generic platform software, which just requires configuration to work successfully with the application software.</p> <p>Digital communications interfaces are managed by the standard NERVIA data communications software (part of the generic platform software) and hardware.</p> <p>Other external interfaces include hardwired analog, discrete and pulse signal inputs, analog and discrete outputs, and power supply. These interfaces are managed through <i>SPINLINE</i> hardware devices.</p>
4e	IEEE 828, Clause 4.3.4, states, in part, that for each type of SCM [software configuration management] the plan shall specify which tools, techniques, equipment, personnel and training are needed and how each resource will be provided or obtained.	<p><u>Training software staff:</u> Rolls-Royce practice is to do the planning for all software project resources in the SDP, not the SCMP. This process is explained in §1.2.1 of "Software Modification Quality Plan", document</p>

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	However, the platform SCMP, Section 3, contains descriptions of the tools and processes to be used for configuration management, but there is no provision to ensure that personnel are made available or adequately trained to execute those processes.	<p>1 208 686 B, which has been provided to NRC.</p> <p>Developer and V&V staff currently are trained using the training materials available on Rolls-Royce intranet. Training records are maintained.</p>
4f	IEEE 828, Clause 4.3.4, states: "SCM plan maintenance information identifies the activities and responsibilities necessary to ensure continued SCM planning during the life cycle of the project." However, the SCMP does not specify how the SCM process will be monitored and maintained or the organizations responsible for those functions. This is important because SCM processes may need to evolve to adapt to other internal or external changes to the project or its external interfaces.	<p><u>Monitoring the SCM process:</u> As stated in §2.8 of the SCMP, the software configuration is monitored using the following set of standard reports:</p> <ul style="list-style-type: none"> • List of Software Document (LSD) • List of tools and libraries used to develop the software • Configuration Management Report • History files <p>As stated in §11 of the SMQP: "Application of the Quality Plan is monitored by the Software Quality Manager (SQM) who makes an objective assessment of the compliance of project products and practices with the methods, standards and rules indicated in this Software Modification Quality Plan." This includes monitoring the project CM activities. Means for monitoring include a series of phase reviews during the lifecycle of the software project and document activities in connection with project documentation.</p> <p><u>Maintaining the SCMP:</u> As stated in §11.1.2 of the SCMP, all software documents are controlled in accordance with the following Rolls-Royce instructions:</p> <ul style="list-style-type: none"> • [IL_Verif_.doc], "Software Document Evaluation Process", 1 207 947 D. • [PRO_Concept_Log_C], "Safety Software Design Process", 8 303 350 J <p>Refer to Table 4b for a complete mapping of Rolls-Royce configuration management guidance to the content guidance in IEEE 828.</p>
4 end	In view of these discrepancies, please explain how these provisions of IEEE 828 were met in the development of the platform software. For example, for IEEE 828 provisions omitted	<p>See the responses to 4a to 4f, above.</p> <p>Also refer to Tables 4a, 4b, and 4c for a complete mapping of</p>

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<p>from the SCMP that are addressed elsewhere, please indicate where and how the software development program directed software developers and V&V personnel to those other references</p>	<p>Rolls-Royce configuration management guidance to the content guidance in IEEE 828-1998.</p> <p>Recognizing that SPINLINE 3 originally was designed and developed under a nuclear QA program that did not comply with 10CFR50 Appendix B, Rolls-Royce has elected to dedicate the generic SPINLINE 3 digital safety I&C platform. As defined in 10CFR21, dedication is an acceptance process undertaken to provide reasonable assurance that a commercial grade item to be used as a basic component will perform its intended safety function and, in this respect, is deemed equivalent to an item designed and manufactured under a 10CFR50, Appendix B, quality assurance program. This assurance is achieved by identifying the critical characteristics of the item and verifying their acceptability by inspections, tests, or analyses. The dedication process must be conducted in accordance with the applicable provisions of 10CFR50, Appendix B. The process is considered complete when the item is designated for use as a basic component.</p> <p>Rolls-Royce is the qualifier and dedicator of the generic SPINLINE 3 digital safety I&C platform. Therefore, dedication is being performed under the 10CFR50 Appendix B-compliant quality program in the Meylan, France office, using the process defined in EPRI TR-106439, "Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications," and accepted by the NRC in an SER. This process is defined in and implemented in accordance with Rolls-Royce documents 3 010 794 A, "Dedication Plan for the Generic SPINLINE 3 Digital Safety I&C Platform" and 8 307 288 A, "QA Procedure for Dedication," which have been submitted to NRC.</p> <p>Completion of this dedication process is being aided by the comprehensive and traceable correspondence between the actual scope of SPINLINE 3 software life cycle documents and the required scope of these documents as established in NRC regulatory requirements and documented in the attached tables and in the SPINLINE 3 Licensing Topical Report (LTR) and other support licensing documents.</p>

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<p>5 The "SPINLINE 3 Software Verification and Validation Plan-SVVP," Doc. No. 8 307 210 B (ADAMS Accession No. ML092160055), a template SVVP for future U.S. projects (application SVVP), generally follows the format of IEEE 1012, but has some discrepancies (see No. 6 below). However, in general, the level of detail in the application SVVP is less than that of IEEE 1012. This presents a challenge to the review in that it will be difficult to verify that regulatory requirements and guidance are met when the application SVVP does not specify the process in as much detail as the guidance for preparing it. Please provide application V&V documentation that includes a level of detail comparable to that in IEEE 1012.</p>	<p><u>Level of detail of the application SVVP template:</u> Note that the application SVVP template is supported by the Rolls-Royce quality management system reference documents listed in §4 of the SVVP template. Parts of what IEEE 1012 recommends for inclusion in an SVVP actually are in other SPINLINE 3 platform software life cycle documents.</p> <p>To help clarify this matter, Rolls-Royce is submitting herewith a set of tables to better explain the relationships of its software life cycle documents to the SVVP format and content guidance in IEEE 1012-1998 (see response to Comment 1, above).</p> <p>Table 5c provides a map that shows where the IEEE 1012-1998 SVVP content is found in SPINLINE 3 application software life cycle documents.</p> <p>Rolls-Royce believes Tables 5c demonstrates that there are no gaps between the SVVP guidance provided in SPINLINE 3 application software life cycle documentation and the corresponding content guidance in IEEE 1012-1998, which has to be interpreted for the case of a generic digital safety I&C platform application. Obviously, there are a few items in IEEE 1012-1998 that apply only in the case of an actual plant-specific system. These items are indicated in the Table 5c as being not applicable in the case of a generic digital safety I&C platform.</p> <p>The differences between the organization of the SVVP guidance in the Rolls-Royce software life cycle documents and IEEE 1012-1998 should be acceptable.</p> <p>Applying the guidance in ISG-06, Rolls-Royce further believes that all V&V documents required upon submittal have been submitted to NRC. Additional V&V process details are available in lower tier documents that ISG-06 indicates are not required upon submittal, but are required within one year of the completion of the NRC review.</p> <p>Rolls-Royce commits to working with the NRC to identify which lower-tier documents are of greatest interest to NRC and then getting these documents translated and delivered to NRC as soon as</p>

NRC Questions		Rolls-Royce Responses
		<p>practical after completion of the Acceptance Review.</p> <p>Rolls-Royce commits to updating the LTR after the Acceptance Review to include Table 5c.</p>
6	<p>The application SVVP is inconsistent with IEEE 1012. For example: IEEE 1012, Table 1, Clause 5.4.4, Item No. 2.3, prescribing traceability activities calls for "consistency" between the software requirements specification (SRS) and the system specifications. It defines consistency as agreement between the level of detail in the SRS and the systems specifications. However, in Section 4.3.1, "Software Requirement Specification Evaluation and Traceability Analysis," of the application SVVP, there is no mention of consistency in the specified traceability activities. Please explain how this provision of IEEE 1012 is to be assured, or justify why no consistency analysis is necessary.</p>	<p><u>Consistency:</u> As described in Section 3.1.2 of the SVVP template, "The V&V tasks are performed in reference to detailed checklists and guidelines". Consistency of a plant-specific application is confirmed with the aid of these checklists. Generic checklists are identified Section 3.6 of the SVVP template and specific uses of checklists are described in Sections 4.1.4, 4.3.1, 4.4.1, 4.5.1 and 5.4 of the SVVP template.</p> <p>Rolls-Royce commits to updating the SVVP template (document 8 307 210B) after the Acceptance Review. The specific changes to be made are as follows: Modify first bullet of 4.3.1 to read : "Verifying that all software requirements are traceable to and consistent with system requirements expressed in upstream documents including the ES and EFD" and second bullet to read : Checking software requirements for correctness, completeness, consistency and accuracy and third bullet : "Checking software interfaces with hardware, operator, sensors and actuators, and other systems for correctness, consistency and completeness</p>
7	<p>Item 2.3 in IEEE 1012, Table 1, Clause 5.4.4, calls for verification of the completeness of source code implementation for particular source code components, for example, exception handling and testability. However, in the application SVVP, Section 4.5.1, "Source Code Evaluation," while tasks are specified for verifying that the source code implements the specified design elements, there is no reference to verification of the completeness of that implementation. Please explain how this provision of IEEE 1012 is to be met.</p>	<p><u>Completeness:</u> For application software, the source code evaluation process, including the use of methods and tools as explained in Section 4.5.1 of generic SVVP template (document 8 307 210 B). One of the tools is a checklist for source code evaluation.</p> <p>Rolls-Royce commits to updating the generic SVVP template (document 8 307 210B) after the Acceptance Review to explain that the checklists provide the primary means to ensure completeness of the new source code produced for a plant-specific implementation of SPINLINE 3.</p>
8	<p>The "SPINLINE 3 Software Quality Assurance Plan-SQAP," Doc. No. 8 307 208 B (ADAMS Accession No. ML092160054), the U.S. template for application SQAPs, states that IEEE Std 730-1998 is "applicable." Does this mean that the platform SQAP is purported to comply with the standard?</p>	<p><u>Compliance:</u> The Rolls-Royce application SQAP template, in conjunction with the supporting Rolls-Royce documents listed in §2, complies with the intent of IEEE 730-1998. While Rolls-Royce recognizes that IEEE 730-1998 has not been endorsed by NRC, the SQAP format and</p>

NRC Questions	Rolls-Royce Responses
	<p>content guidance in §4 of IEEE 730-1998, as a supplement to the guidance in IEEE 1074-1995, was a useful point of reference for internally assessing the completeness of the SPINLINE 3 software quality plans.</p> <p>Rolls-Royce notes that the IEEE software life cycle standards on which the SPINLINE 3 application software plans are based overlap significantly. Therefore, strict compliance with these IEEE standards will result in unnecessary, and undesirable duplication of content among the life cycle plans.</p> <p>Rolls-Royce further points to the following statement from NUREG-0800, BTP 7-14, Section B.3:</p> <p style="padding-left: 40px;">“Conformance to a regulatory guide can be partial or complete (unqualified). For example, ‘format conformance’ for a plan would mean that the plan would be in the format specified. “Content conformance” means that all guidance is carried out as defined, but not necessarily presented in the format specified.”</p> <p><u>Mapping to IEEE 730-1998 SQAP content guidance:</u></p> <p>Rolls-Royce is submitting herewith Tables 3a, 3b, and 3c, which provide maps that show where the IEEE 730 SQAP content is found in SPINLINE 3 software life cycle documents for three cases: (1) the original MC3 project that created the SPINLINE 3 platform software, (2) future SPINLINE 3 platform software modification projects, and (3) future plant-specific application software projects.</p> <ul style="list-style-type: none"> • Table 3a: Mapping SPINLINE 3 SQA MC3 and Other Content to IEEE 730-1998 SQAP Content Guidance • Table 3b: Mapping SPINLINE 3 SQMP and Other Content to IEEE 730-1998 SQAP Content Guidance • Table 3c: Mapping SPINLINE 3 Application SQAP and Other Content to IEEE 730-1998 SQAP Content Guidance <p>Documents that have been submitted to the NRC are indicated in these tables.</p>

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		Rolls-Royce believes Tables 3a to 3c demonstrate that there are no gaps between the SQAP guidance provided in SPINLINE 3 software life cycle documentation and the corresponding content guidance in IEEE 730-1998. This reinforces the similar finding reported in response to Question 2, above, relative to the IEEE 1074-1995 software life cycle activities.
9	Please clarify whether documents that state that certain references are "applicable," are purported to comply with those references.	<u>Compliance:</u> The Rolls-Royce document in question, in conjunction with the supporting Rolls-Royce documents listed therein, complies with the intent of "applicable" regulatory guide or standard. See the clarification in response to Question 8, above.

Table 1. Evolution of Selected SPINLINE 3 Software Life Cycle Documents

ISG-06 App B.3 Item #	ISG-06 App B.3 Document Title	Rolls-Royce Document Title	Platform Software				App SW
			Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project	Applicable to future SPINLINE 3 plant- specific application software
ISG-06 Documents Expected Upon Application		Corresponding Generic <i>SPINLINE 3</i> Licensing Documents Available Upon Application					
12	Quality Assurance Plan for Digital Hardware and Software	Rolls-Royce Civil Nuclear SAS Quality Manual (former SES department Quality Assurance Manual)	8 303 186 A/B/C/D/E/F	8 303 186 G	8 303 186 H	8 303 186 P	8 303 186 P
		Software Quality Plan (SQP) - MC3	8 303 429 A/B/C/D/E	8 303 429 E	8 303 429 E	Not applicable	Not applicable
		Software Modification Quality Plan	Not applicable	Not applicable	1 208 686 A	1 208 686 B	Not applicable
		Software Quality Plan - SCADE Operator Library	Not applicable	1 208 356 A	1 208 356 A	1 208 356 C	Not applicable
		SPINLINE 3 Software Quality Assurance Plan - SQAP	Not applicable	Not applicable	Not applicable	Not applicable	8 307 208 B
17a	Vendor Software CM Plan	Software Quality Plan (SQP) - MC3 (This Plan + supporting instructions functioned as the SCMP)	8 303 429 A/B/C/D/E	Not applicable	Not applicable	Not applicable	Not applicable
		Software Configuration Management Plan for <i>SPINLINE 3</i> Software Sub-assemblies Managed by CM Tool	Not applicable	1 208 878 A	1 208 878 B	1 208 878 D	Not applicable
		SPINLINE 3 Software Configuration Management Plan - SCMP	Not applicable	Not applicable	Not applicable	Not applicable	8 307 209 B
17b	Software Design Specification	Software Preliminary Design - Core System Software	1 207 141 A/B/C/D/E	1 207 141 F	1 207 141 G	1 207 141 H	Not applicable
		Interface Specifications - Operational System Software and Application Software	1 207 110 A/B/C/D/E/F	1 207 110 G	1 207 110 H	1 207 110 J	1 207 110 J
17c	Software Development Plan	Software Development Plan - MC3	1 207 102 A	Not applicable	Not applicable	Not applicable	Not applicable
		Software Development Plan (SDP) - 2000 changes	Not applicable	1 208 645 A	Not applicable	Not applicable	Not applicable
		Software Development Plan (SDP) - 2001 changes	Not applicable	Not applicable	1 208 908 A	Not applicable	Not applicable
		Software Development Plan (SDP) - Future	Not applicable	Not applicable	Not applicable	Project-specific SDP	Not applicable
		SPINLINE 3 Software Development Plan - SDP	Not applicable	Not applicable	Not applicable	Not applicable	8 307 210 B
17e	Software Integration Plan	Software Integration Test Plan and Report (SITR) - SCC (Core System Software)	1 207 204 A/B/C	1 207 204 D	1 207 204 D	1 207 204 E	Not applicable
17k	Software Test Plan						

Table 1. Evolution of Selected SPINLINE 3 Software Life Cycle Documents

ISG-06 App B.3 Item #	ISG-06 App B.3 Document Title	Rolls-Royce Document Title	Platform Software				App SW
			Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project	Applicable to future SPINLINE 3 plant- specific application software
15	System Requirements	Software Requirement Specification - Operational System Software	1 207 108 A/B/C/D/E/F	1 207 108 G	1 207 108 H	1 207 108 J	Not applicable
17h	Platform Software Requirements Specification						
14	Safety Analysis	SPINLINE 3 Safety of Processing Unit Software	1 207 228 A/B/C/D/E	1 207 228 F	1 207 228 G	1 207 228 H	Not applicable
17j	Software Safety Plan						
17l	Software Tool Verification Program	Requirements for Software Development Tools	1 206 747 A/B/C	1 206 747 C	1 206 747 C	1 206 747 E	Not applicable
17m	Software Verification and Validation Plan	Software Quality Plan (SQP) - MC3 (This Plan + SVTP and supporting instructions functioned as the SVVP)	8 303 429 A/B/C/D/E	8 303 429 E	Not applicable	Not applicable	Not applicable
		Software Validation Test Plan (SVTP) - Operational System Software for Safety Class Units	1 207 146 A/B/C/D	1 207 146 E	1 207 146 F	1 207 146 G	Not applicable
		Software Modification Quality Plan (This Plan + SVTP and supporting instructions functioned as the SVVP)	Not applicable	Not applicable	1 208 686 A	1 208 686 B	Not applicable
		SPINLINE 3 Software Verification and Validation Plan - SVVP	Not applicable	Not applicable	Not applicable	Not applicable	8 307 210 B
ISG-06 Documents Expected Within 12 Months of Requested Approval		Corresponding Generic SPINLINE 3 Licensing Documents Available Within 12 Months of Requested Approval					
19	V&V Reports	Software Validation Test Report (SVTR) - Operationa System Software for Safety Class Units	1 207 232 A/B/C	1 207 232 D	1 207 232 E	1 207 232 F	Not applicable

Document submitted to
NRC

Table 2. Alignment of IEEE 1074-1995 Activities, ISG-06 Tier 3 Document Guidance, and SPINLINE 3 Documents

IEEE 1074-1995 Software Life Cycle Activities	SPINLINE 3 Life Cycle Phases							Alignment to ISG-06 Documents			Alignment to Rolls-Royce Documents						Comments
	Specification	Preliminary Design	Detailed Design	Coding	Unit Test	Integration	Validation	US, Later or Audit *	Doc Nr.	ISG-06 Document Title	Rolls-Royce Document Title	Platform Software				App SW	
												Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project	Applicable to future SPINLINE 3 plant-specific application software	
Software Life Cycle Process																	
Identify Candidate SW Life Cycle Models	X							UA	12	Quality Assurance Plan for Digital Hardware and Software	Rolls-Royce Civil Nuclear SAS Quality Manual (former SES department Quality Assurance Manual)	8 303 186 A/B/C/D	8 303 186 G	8 303 186 H	8 303 186 P	8 303 186 P	The software life cycle model selected by Rolls-Royce is integrated with SPINLINE 3 industrial processes.
											Software Quality Plan (SQP) - MC3	8 303 429 E	8 303 429 E	8 303 429 E	Not applicable	Not applicable	
											Software Modification Quality Plan	Not applicable	Not applicable	1 208 686 A	1 208 686 B	Not applicable	
											Software Quality Plan - SCADE Operator Library	Not applicable	1 208 356 A	1 208 356 A	1 208 356 C	Not applicable	
											SPINLINE 3 Software Quality Assurance Plan - SQAP	Not applicable	Not applicable	Not applicable	Not applicable	8 307 208 B	
								UA		Several	Licensing Topical Report	Not applicable	Not applicable	Not applicable	3 008 503B, § 6.1 & Figure 6.2-1	3 008 503B, Figure 6.4-1	
Select Project Model	X							UA	17c	Software Development Plan	Software Development Plan - MC3	1 207 102 A	Not applicable	Not applicable	Not applicable	Not applicable	The project model developed by Rolls-Royce is integrated with SPINLINE 3 industrial processes.
											Software Development Plan (SDP) - 2000 changes	Not applicable	1 208 645 A	Not applicable	Not applicable	Not applicable	
											Software Development Plan (SDP) - 2001 changes	Not applicable	Not applicable	1 208 908 A	Not applicable	Not applicable	
											Software Development Plan (SDP) - Future	Not applicable	Not applicable	Not applicable	Project-specific SDP	Not applicable	
											SPINLINE 3 Software Development Plan - SDP	Not applicable	Not applicable	Not applicable	Not applicable	8 307 210 B	
Project Management Processes																	
Project Initiation Process																	
Map Activities to SLC Model	X							UA	12	Quality Assurance Plan for Digital Hardware and Software	Included in the applicable SQAP	8 303 429 E	8 303 429 E	8 303 429 E	1 208 686 B	8 307 208 B	The alignment of software activities to the software life cycle model is discussed in the SPINLINE 3 LTR.
								UA	17c	Software Development Plan	Included in the applicable SDP	1 207 102 A	1 208 645 A	1 208 908 A	Project-specific SDP	8 307 211 B	
								UA		Several	Licensing Topical Report	Not applicable	Not applicable	Not applicable	3 008 503B, § 6.1 & Figure 6.2-1	3 008 503B, Figure 6.4-1	
Allocate Project Resources	X	X	X	X	X	X	X	UA	17c	Software Development Plan	Included in the applicable SDP	1 207 102 A	1 208 645 A	1 208 908 A	Project-specific SDP	8 307 211 B	
								Later	14	Quality Assurance Procedures for Digital Hardware and Software	Resources management process	Not applicable	Not applicable	8 303 696 A	8 303 696 E	8 303 696 E	

Table 2. Alignment of IEEE 1074-1995 Activities, ISG-06 Tier 3 Document Guidance, and SPINLINE 3 Documents

IEEE 1074-1995 Software Life Cycle Activities	SPINLINE 3 Life Cycle Phases							Alignment to ISG-06 Documents			Alignment to Rolls-Royce Documents						Comments
	Specification	Preliminary Design	Detailed Design	Coding	Unit Test	Integration	Validation	US, Later or Audit *	Doc Nr.	ISG-06 Document Title	Rolls-Royce Document Title	Platform Software				App SW	
												Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project	Applicable to future SPINLINE 3 plant-specific application software	
Establish Project Environment	X	X						UA	17c	Software Development Plan	Included in the applicable SDP	1 207 102 A	1 208 645 A	1 208 908 A	Project-specific SDP	8 307 211 B	
								Later	14	Quality Assurance Procedures for Digital Hardware and Software	SPINLINE 3 technical instruction: Description of development environments [IT_SL3_Env_Dev]	1 207 105 A/B/C	1 207 105 D	1 207 105 D	1 207 105 D	Not applicable	
Plan Project Management	X	X						UA	17c	Software Development Plan	Included in the applicable SDP	1 207 102 A	1 208 645 A	1 208 908 A	Project-specific SDP	8 307 211 B	
								Later	18a	Software Management Implementing Procedures	Processes for Software Development [IL_PROC_GEN]	1 208 079 A	1 208 079 E	1 208 079 E	Not applicable	Not applicable	
											Safety Software Design Process [PRO_Concept_log_C]	Not applicable	Not applicable	Not applicable	8 303 350 J	8 303 350 J	
											Non Safety Software Design Process [PRO_Concept_log_NC]	Not applicable	Not applicable	Not applicable	8 307 214 A	8 307 214 A	
											Software Guideline: Software Management Process [IL_Gest_Proj]	Not applicable	1 208 055 B	1 208 055 B	1 208 055 E	1 208 055 E	
Project Monitoring and Control Process																	
Analyze Risks	X	X	X	X	X	X	X	UA	17g	Software Project Risk Management Plan	Rolls-Royce Civil Nuclear SAS Quality Manual (former SES department Quality Assurance Manual)	8 303 186 A/B/C/D	8 303 186 G	8 303 186 H	8 303 186 P, 5.3, 7.0, 8.5.3	8 303 186 P, 5.3, 7.0, 8.5.3	There is no separate Risk Management Plan. Risk management (analysis and mitigation planning) is integrated with basic quality management system processes
											Risk analysis is included in applicable Software Development Plan	1 207 102 A, § 8	1 208 645 A, § 8	1 208 908 A, § 8	Project-specific SDP	8 307 211 B, § 7 and more in the other application SW Plans	
Perform Contingency Planning	X	X	X	X	X	X	X	UA	17c	Software Development Plan	Contingency planning is part of risk management	See risk analysis above	See risk analysis above	See risk analysis above	See risk analysis above	See risk analysis above	

Table 2. Alignment of IEEE 1074-1995 Activities, ISG-06 Tier 3 Document Guidance, and SPINLINE 3 Documents

IEEE 1074-1995 Software Life Cycle Activities	SPINLINE 3 Life Cycle Phases							Alignment to ISG-06 Documents			Alignment to Rolls-Royce Documents						Comments		
	Specification	Preliminary Design	Detailed Design	Coding	Unit Test	Integration	Validation	US, Later or Audit *	Doc Nr.	ISG-06 Document Title	Rolls-Royce Document Title	Platform Software				App SW			
												Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project	Applicable to future SPINLINE 3 plant-specific application software			
Manage the Project	X	X	X	X	X	X	X	UA	12	Quality Assurance Plan for Digital Hardware and Software	Apply the processes defined in the applicable SQAP, SDP and supporting procedures	See SQAP and SDP listed above	See SQAP and SDP listed above	See SQAP and SDP listed above	See SQAP and SDP listed above	See SQAP and SDP listed above			
								UA	17c	Software Development Plan									
								Later	14	Quality Assurance Procedures for Digital Hardware and Software	General Processes for Software Development [IL_PROC_GEN]	1 208 079 A/B/C/D	1 208 079 E	1 208 079 E	Not applicable	Not applicable			
											Safety Software Design Process [PRO_Concept_log_C]	Not applicable	Not applicable	Not applicable	8 303 350 J	8 303 350 J			
											Non Safety Software Design Process [PRO_Concept_log_NC]	Not applicable	Not applicable	Not applicable	8 307 214 A	8 307 214 A			
Retain Records	X	X	X	X	X	X	X	UA	12	Quality Assurance Plan for Digital Hardware and Software	Apply the process defined in the applicable SQAP above	8 303 429 E, § 1.2.4 & 10.3	8 303 429 E, § 1.2.4 & 10.3	1 208 686 A	1 208 686 B, § 10 & 11.3	8 307 208 B, § 1.4 and 12			
Implement Problem Reporting System	X	X	X	X	X	X	X	UA	12	Quality Assurance Plan for Digital Hardware and Software	Rolls-Royce Civil Nuclear SAS Quality Manual (former SES department Quality Assurance Manual)	8 303 186 A/B/C/D	8 303 186 G	8 303 186 H	8 303 186 P, § 8.3	8 303 186 P, § 8.3			
								Later	14	Quality Assurance Procedures for Digital Hardware and Software	Non conformity	8 303 202 E	8 303 202 F	8 303 202 G	8 303 202 M	8 303 202 M			
											Classified nonconformities	Not applicable	Not applicable	Not applicable	8 307 152 B	8 307 152 B			
Software Quality Management Process																			
Plan Software Quality Management	X	X								UA	12	Quality Assurance Plan for Digital Hardware and Software	Rolls-Royce Civil Nuclear SAS Quality Manual (former SES department Quality Assurance Manual)	8 303 186 A/B/C/D	8 303 186 G	8 303 186 H	8 303 186 P	8 303 186 P	
													Software Quality Plan (SQP) - MC3	8 303 429 E	8 303 429 E	8 303 429 E	Not applicable	Not applicable	
													Software Modification Quality Plan	Not applicable	Not applicable	1 208 686 A	1 208 686 B	Not applicable	
													Software Quality Plan - SCADE Operator Library	Not applicable	1 208 356 A	1 208 356 A	1 208 356 C	Not applicable	
													SPINLINE 3 Software Quality Assurance Plan - SQAP	Not applicable	Not applicable	Not applicable	Not applicable	8 307 208 B	This document is a plan template that will be completed for each plant-specific system.

Table 2. Alignment of IEEE 1074-1995 Activities, ISG-06 Tier 3 Document Guidance, and SPINLINE 3 Documents

IEEE 1074-1995 Software Life Cycle Activities	SPINLINE 3 Life Cycle Phases							Alignment to ISG-06 Documents			Alignment to Rolls-Royce Documents					Comments			
	Specification	Preliminary Design	Detailed Design	Coding	Unit Test	Integration	Validation	US, Later or Audit *	Doc Nr.	ISG-06 Document Title	Rolls-Royce Document Title	Platform Software					App SW		
												Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project		Applicable to future SPINLINE 3 plant-specific application software		
Define Metrics	X	X	X					UA	12	Quality Assurance Plan for Digital Hardware and Software	Rolls-Royce Civil Nuclear SAS Quality Manual (former SES department Quality Assurance Manual)	8 303 186 A/B/C/D	8 303 186 G	8 303 186 H	8 303 186 P, § 8.2	8 303 186 P, § 8.2			
Manage Software Quality	X	X	X	X	X	X	X	Later	14	Quality Assurance Procedures for Digital Hardware and Software	Software Quality Control Process	8 303 634 A	8 303 634 A	8 303 634 A	8 303 634 E	8 303 634 E			
Identify Quality Improvement Needs	X	X	X	X	X	X	X	UA	12	Quality Assurance Plan for Digital Hardware and Software	Rolls-Royce Civil Nuclear SAS Quality Manual (former SES department Quality Assurance Manual)	8 303 186 A/B/C/D	8 303 186 G	8 303 186 H	8 303 186 P, § 8.5	8 303 186 P, § 8.5			
	X	X	X	X	X	X	X	Later	14	Quality Assurance Procedures for Digital Hardware and Software	Continuous improvement process	Not applicable	Not applicable	8 303 695 A	8 303 695 E	8 303 695 E			
Pre-Development Processes																			
Concept Exploration Process																			
Identify Ideas or Needs	X							Later	14	Quality Assurance Procedures for Digital Hardware and Software	General Processes for Software Development [IL_PROC_GEN]	1 208 079 A/B/C/D	1 208 079 E	1 208 079 E	Not applicable	Not applicable	The concept exploration process may be performed by the licensee in connection with their development of the bid specification for a new or replacement digital safety I&C system. If requested, Rolls-Royce can assist the licensee in this process.		
Formulate Potential Approaches	X	X																	
Conduct Feasibility Studies	X	X																	
Plan System Transition (if applicable)	X	X																	
Refine and Finalize the Idea or Need		X																	
System Allocation Process																			
Analyze Functions		X	X					Later	14	Quality Assurance Procedures for Digital Hardware and Software	General Processes for Software Development [IL_PROC_GEN]	1 208 079 A/B/C/D	1 208 079 E	1 208 079 E	Not applicable	Not applicable	These activities primarily apply to a plant-specific system		
Develop System Architecture		X	X										Safety software design process [PRO_Concept_log_C] (formerly Software Design Control)	Not applicable	Not applicable	Not applicable		8 303 350 K	8 303 350 K
Decompose System Requirements		X	X										Non safety software design process [PRO_Concept_log_NC]	Not applicable	Not applicable	Not applicable		8 307 214 B	8 307 214 B
								UA	18	Requirements Traceability Matrix	Licensing Topical Report	Not applicable	Not applicable	Not applicable	3 008 503B, § 3	Plant-specific RTM			

Table 2. Alignment of IEEE 1074-1995 Activities, ISG-06 Tier 3 Document Guidance, and SPINLINE 3 Documents

IEEE 1074-1995 Software Life Cycle Activities	SPINLINE 3 Life Cycle Phases							Alignment to ISG-06 Documents			Alignment to Rolls-Royce Documents						Comments
	Specification	Preliminary Design	Detailed Design	Coding	Unit Test	Integration	Validation	US, Later or Audit *	Doc Nr.	ISG-06 Document Title	Rolls-Royce Document Title	Platform Software				App SW	
												Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project	Applicable to future SPINLINE 3 plant-specific application software	
Development Processes																	
Requirements Process																	
Define and Develop Software Requirements	X	X	X					UA	17b	Software Design Specification	Software Preliminary Design - Core System Software	1 207 141 A/B/C/C/DE	1 207 141 F	1 207 141 G	1 207 141 H	Not applicable	Preliminary software requirements typically are established by the licensee.
								UA	17h	Platform Software Requirements Specification	Software Requirement Specification - Operational System Software	1 207 108 A/B/C/D/E/F/	1 207 108 G	1 207 108 H	1 207 108 J	Not applicable	
								UA	17i	Application Software Requirements Specification	None. This is a plant-specific document for an application to be built on the generic SPINLINE 3 platform.	Not applicable	Not applicable	Not applicable	Not applicable	Plant-specific specification	
Define Interface Requirements	X	X	X					UA	17b	Software Design Specification	Interface Specifications - Operational System Software and Application Software	1 207 110 A/B/C/D/EF	1 207 110 G	1 207 110 H	1 207 110 J	1 207 110 J	
Prioritize and Integrate Software Requirements	X	X	X					UA	17e	Software Integration Plan	Software Integration Test Plan and Report (SITR) - SCC (Core System Software)	1 207 204 A/BC	1 207 204 D	1 207 204 D	1 207 204 E	Not applicable	
											SPINLINE 3 Software Verification and Validation Plan - SVVP	Not applicable	Not applicable	Not applicable	Not applicable	8 307 210B	
Design Process																	
Perform Architectural Design		X	X					Later	14	Quality Assurance Procedures for Digital Hardware and Software	General Processes for Software Development [IL_PROC_GEN]	1 208 079 A/B/C/D	1 208 079 E	1 208 079 E	Not applicable	Not applicable	A standard process guides the design effort for a modification to the generic platform software or for a plant-specific system.
Design Data Base (if applicable)		X	X														
Design Interfaces		X	X														
Select or Develop Algorithms		X	X								Safety Software Design Process [PRO_Concept_log_C]	Not applicable	Not applicable	Not applicable	8 303 350 K	8 303 350 K	
Perform Detailed Design			X								Non Safety Software Design Process [PRO_Concept_log_NC]	Not applicable	Not applicable	Not applicable	8 307 214 B	8 307 214 B	
Implementation Process																	
Create Test Data			X	X						None	Test data requirements are established in the respective Test Plans	See Test Plans, below	See Test Plans, below	See Test Plans, below	See Test Plans, below	See Test Plans, below	
Create Source				X	X	X		Audit	8	Software Code Listings	SPINLINE 3 Technical Instruction: Description of Development Environments [IT_SL3_Env_Dev]	1 207 105 A/B/C/D	1 207 105 D	1 207 105 D	1 207 105 D	Not applicable	

Table 2. Alignment of IEEE 1074-1995 Activities, ISG-06 Tier 3 Document Guidance, and SPINLINE 3 Documents

IEEE 1074-1995 Software Life Cycle Activities	SPINLINE 3 Life Cycle Phases							Alignment to ISG-06 Documents			Alignment to Rolls-Royce Documents						Comments
	Specification	Preliminary Design	Detailed Design	Coding	Unit Test	Integration	Validation	US, Later or Audit *	Doc Nr.	ISG-06 Document Title	Rolls-Royce Document Title	Platform Software				App SW	
												Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project	Applicable to future SPINLINE 3 plant-specific application software	
Generate Object Code				X	X	X		Audit	8	Software Code Listings	Software Manufacturing File – Programming Instruction document	1 207 287 A	1 207 287 A	1 207 287 B	1 207 287 C	Not applicable	
Create Operating Documentation				X	X	X				None	System Operations and Maintenance Plan	Not applicable	Not applicable	Not applicable	Not applicable	8 307 244 A	This document is a plan template that will be completed for each plant-specific system.
Plan Integration				X	X			UA	17e	Software Integration Plan	Software Integration Test Plan and Report (SITR) - SCC (Core System Software)	1 207 204 A/B/C	1 207 204 D	1 207 204 D	1 207 204 E	Not applicable	
											System Integration and Factory Test Plan	Not applicable	Not applicable	Not applicable	Not applicable	8 307 245 A	This document is a plan template that will be completed for each plant-specific system.
Perform Integration						X		UA	16	System Test Plan	Apply the process defined in the Software Integration Test Plan above. Produce the "Report" part of the SITR.	See SITR above	See SITR above	See SITR above	See SITR above	Not applicable	
Post-Development Processes																	
Installation Process																	
Plan Installation					X	X		UA	17d	Software Installation Plan	System Integration and Factory Test Plan (Generic)	Not applicable	Not applicable	Not applicable	Not applicable	8 307 245 A	These documents are plan templates that will be completed for each plant-specific system.
											System Installation and Site Test Plan (Generic)	Not applicable	Not applicable	Not applicable	Not applicable	8 307 243 A	
								Later	12	Installation Test Plans and Procedures	System Installation and Site Test Plan (Generic)	Not applicable	Not applicable	Not applicable	Not applicable	8 307 243 A	
Distribute Software					X	X	X	Later	14	Quality Assurance Procedures for Digital Hardware and Software	Software Manufacturing File – Programming Instruction document (one document per software)	1207287 A	1207287 A	1207287 B	1207287 C	Not applicable	Software manufacturing process distributes executable code to EEPROMS that are installed on the UC25+ CPU boards
Install Software					X	X	X	Later	12	Installation Test Plans and Procedures							
Accept Software in Operational Environment							→	Later	12	Installation Test Plans and Procedures	System Installation and Site Test Plan	Not applicable	Not applicable	Not applicable	Not applicable	8 307 243 A	Licensee makes the decision to accept the system following successful completion of site acceptance test or other criteria established in the contract for the system.

Table 2. Alignment of IEEE 1074-1995 Activities, ISG-06 Tier 3 Document Guidance, and SPINLINE 3 Documents

IEEE 1074-1995 Software Life Cycle Activities	SPINLINE 3 Life Cycle Phases							Alignment to ISG-06 Documents			Alignment to Rolls-Royce Documents						Comments
	Specification	Preliminary Design	Detailed Design	Coding	Unit Test	Integration	Validation	US, Later or Audit *	Doc Nr.	ISG-06 Document Title	Rolls-Royce Document Title	Platform Software				App SW	
												Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project	Applicable to future SPINLINE 3 plant-specific application software	
Operation and Support Process																	
Operate the System							→			None	System Operations and Maintenance Plan	Not applicable	Not applicable	Not applicable	Not applicable	8 307 244 A	This document is a plan template that will be completed for each plant-specific system. The licensee operates the system
Provide Tech. Asst. & Consult							→	Later	14	Quality Assurance Procedures for Digital Hardware and Software	On-site activities process	Not applicable	Not applicable	Not applicable	Not applicable	8 303 659 E	The licensee may contract Rolls-Royce for technical assistance and/or consulting
											Presentation and organization of On-site activities group	Not applicable	Not applicable	Not applicable	Not applicable	8 303 373 N	
											On site Maintenance, Preparation, Follow-up	Not applicable	Not applicable	Not applicable	Not applicable	8 303 382 K	
Maintain Support Request Log							→	Later	14	Quality Assurance Procedures for Digital Hardware and Software	Establishment of on-site activities reports	Not applicable	Not applicable	Not applicable	Not applicable	8 303 384 L	Rolls-Royce maintains a log of customer support activities.
											On site non conformities	Not applicable	Not applicable	Not applicable	Not applicable	8 303 647 G	
Maintenance Process																	
Reapply Software Life Cycle							→			None	Software Modification Quality Plan	Not applicable	Not applicable	1 208 686 A	1 208 686 B	Not applicable	
Retirement Process																	
Notify User							→			None							The licensee will make the decision to initiate replacement and retirement of a system.
Conduct Parallel Operations (if applicable)							→			None							Rolls-Royce has structured projects with parallel operation of the original system and the new digital system. This is captured in the SDP.
Retire System							→			None							The licensee will make the decision to retire a system.

Table 2. Alignment of IEEE 1074-1995 Activities, ISG-06 Tier 3 Document Guidance, and SPINLINE 3 Documents

IEEE 1074-1995 Software Life Cycle Activities	SPINLINE 3 Life Cycle Phases							Alignment to ISG-06 Documents		Alignment to Rolls-Royce Documents						Comments	
	Specification	Preliminary Design	Detailed Design	Coding	Unit Test	Integration	Validation	US, Later or Audit *	Doc Nr.	ISG-06 Document Title	Rolls-Royce Document Title	Platform Software					App SW
												Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project		Applicable to future SPINLINE 3 plant-specific application software
Integral Processes																	
Verification and Validation Process																	
Plan Verification and Validation	X	X						UA	17m	Software V&V Plan and Procedures	Software Quality Plan (SQP) - MC3 (This Plan + SITR, SVTP and supporting instructions functioned as the SVVP)	8 303 429 E, § 5 & 9.1.6	8 303 429 E, § 5 & 9.1.6	8 303 429 E, § 5 & 9.1.6	Not applicable	Not applicable	The MC3 SQP, 8 303 429 E, served the function of the SVVP where indicated.
											Software Modification Quality Plan (This Plan + SITR, SVTP and supporting instructions functioned as the SVVP)	Not applicable	Not applicable	1 208 686 A	1 208 686 B	Not applicable	The SMQP, 1 208 686 A, served the function of the SVVP where indicated.
											SPINLINE 3 Software Verification and Validation Plan - SVVP	Not applicable	Not applicable	Not applicable	Not applicable	8 307 210 B	This document is a plan template that will be completed for each plant-specific system.
								Later	14	Quality Assurance Procedures for Digital Hardware and Software	Rules for Verification & Validation of software components	1 207 107 A/B/C	1 207 107 C	1 207 107 C	1 207 107 C	1 207 107 C	
Execute V&V Tasks	X	X	X	X	X	X	X	Later	14	Quality Assurance Procedures for Digital Hardware and Software	Apply processes defined in the applicable V&V Plan and procedures	See SVVP above	See SVVP above	See SVVP above	See SVVP above	See SVVP above	
Collect and Analyze Metric Data			X	X	X	X		Later	14	Quality Assurance Procedures for Digital Hardware and Software	Apply processes defined in the applicable V&V Plan and procedures	See SVVP above	See SVVP above	See SVVP above	See SVVP above	See SVVP above	
Plan Testing				X	X	X		UA	17e, 17k	Software Integration Plan, Software Test Plan	Software Integration Test Plan and Report (SITR) - SCC (Core System Software)	1 207 204 A/B/C	1 207 204 D	1 207 204 D	1 207 204 E	Not applicable	
								UA	17e, 17k	Software Integration Plan, Software Test Plan	Software Validation Test Plan (SVTP) - Operational System Software for Safety Class Units	1 207 146 A/B/C	1 207 146 E	1 207 146 F	1 207 146 G	Not applicable	
Develop Test Requirements				X	X	X		Audit	6	Test requirements included in Test Plan	Test requirements included in Test Plan	See Test Plan for test requirements	See Test Plan for test requirements	See Test Plan for test requirements	See Test Plan for test requirements	See Test Plan for test requirements	
Execute the Tests						X	X	Later	19	V&V Reports	Software Validation Test Report (SVTR) - Operational System Software for Safety Class Units	1 207 232 A/B/C	1 207 232 D	1 207 232 E	1 207 232 F	Not applicable	
								Audit	6	Individual Completed Test Procedures & Reports	Tests and test reports as required by the applicable Test Plan	See Test Plan for list of test reports	See Test Plan for list of test reports	See Test Plan for list of test reports	See Test Plan for list of test reports	See Test Plan for list of test reports	

Table 2. Alignment of IEEE 1074-1995 Activities, ISG-06 Tier 3 Document Guidance, and SPINLINE 3 Documents

IEEE 1074-1995 Software Life Cycle Activities	SPINLINE 3 Life Cycle Phases							Alignment to ISG-06 Documents			Alignment to Rolls-Royce Documents						Comments
	Specification	Preliminary Design	Detailed Design	Coding	Unit Test	Integration	Validation	US, Later or Audit *	Doc Nr.	ISG-06 Document Title	Rolls-Royce Document Title	Platform Software				App SW	
												Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project	Applicable to future SPINLINE 3 plant-specific application software	
Software Configuration Management Process																	
Plan Configuration Management	X	X						UA	17a	Vendor Software CM Plan	Software Quality Plan (SQP) - MC3 (This Plan + supporting instructions functioned as the SCMP)	8 303 429 E, § 7 & 8	8 303 429 E, § 5 & 9.1.6	8 303 429 E, § 5 & 9.1.6	Not applicable	Not applicable	
											Software Configuration Management Plan for <i>SPINLINE 3</i> Software Sub-assemblies Managed by CM Tool	Not applicable	1 208 878 A	1 208 878 B	1 208 878 D	Not applicable	
											SPINLINE 3 Software Configuration Management Plan - SCMP	Not applicable	Not applicable	Not applicable	Not applicable	8 307 209 B	
								Later	14	Quality Assurance Procedures for Digital Hardware and Software	Software Maintenance and Changes	1 206 624 A	Not applicable	Not applicable	Not applicable	Not applicable	
											Software Configuration Management Process [IL_Gest_Conf]	Not applicable	1 207 875 B	1 207 875 B	1 207 875 F	1 207 875 F	
Perform Configuration Identification	X	X	X	X	X	X	X	Later	10	Final System Configuration Documentation	Apply processes defined in the applicable CM Plan and procedures	8 303 429 E, § 7.2, 7.3, 7.4	8 303 429 E, § 7.2, 7.3, 7.4	8 303 429 E, § 7.2, 7.3, 7.4	1 208 878 D, § 2.2, 2.5 & 3.1	8 307 209 B, § 4.1 & 5.2	The MC3 SQP, 8 303 429 E, served the function of the SCMP where indicated.
Perform Configuration Control	X	X	X	X	X	X	X	Later	10	Final System Configuration Documentation	Apply processes defined in the applicable CM Plan and procedures	8 303 429 E, § 8	8 303 429 E, § 8	8 303 429 E, § 8	1 208 878 D, § 2.3, 2.4, 2.7, 2.9, 3.3, 3.4 & 3.5	8 307 209 B, § 4.2, 5.3 & 6.3	The MC3 SQP, 8 303 429 E, served the function of the SCMP where indicated.
Perform Status Accounting	X	X	X	X	X	X	X	Later	10	Final System Configuration Documentation	Apply processes defined in the applicable CM Plan and procedures	8 303 429 E, § 10.3	8 303 429 E, § 10.3	8 303 429 E, § 10.3	1 208 878 D, § 2.8	8 307 209 B, § 4.3, 5.4 & 6.3.4	The MC3 SQP, 8 303 429 E, served the function of the SCMP where indicated.
Documentation Development Process																	
Plan Documentation	X	X						UA	12	Quality Assurance Plan for Digital Hardware and Software	Included in SQAP and other Plans identified above	8 303 429 E, § 6	8 303 429 E, § 6	8 303 429 E, § 6	Not applicable	Not applicable	
												Not applicable	Not applicable	1 208 686 A	1 208 686 B, § 4	8 307 208 B, § 4	
								Later	14	Quality Assurance Procedures for Digital Hardware and Software	Documents and reference files management [Gest_Doc_Col_Ref]	8 303 638 A	8 303 638 A	8 303 638 A	8 303 638 B	8 303 638 B	
											Software Guideline: Software Document Evaluation Process [IL_Verif_Doc]	1 207 947 A/B/C	1 207 947 C	1 207 947 C	1 207 947 D	1 207 947 D	

Table 2. Alignment of IEEE 1074-1995 Activities, ISG-06 Tier 3 Document Guidance, and SPINLINE 3 Documents

IEEE 1074-1995 Software Life Cycle Activities	SPINLINE 3 Life Cycle Phases							Alignment to ISG-06 Documents		Alignment to Rolls-Royce Documents						Comments	
	Specification	Preliminary Design	Detailed Design	Coding	Unit Test	Integration	Validation	US, Later or Audit *	Doc Nr.	ISG-06 Document Title	Rolls-Royce Document Title	Platform Software					App SW
												Used in original MC3 project platform software project	Used in 2000 SPINLINE 3 platform SW upgrade project	Used in 2001 SPINLINE 3 platform SW upgrade project	Applicable to a future SPINLINE 3 platform SW upgrade project		Applicable to future SPINLINE 3 plant-specific application software
Implement Documentation	X	X	X	X	X	X	X	UA, Later and Audit		Many	Apply documentation processes defined in the applicable SQAP and other Plans identified above.	See Plan Documentation above	See Plan Documentation above	See Plan Documentation above	See Plan Documentation above	See Plan Documentation above	
Produce and Distribute Documentation	X	X	X	X	X	X	X	UA, Later and Audit		Many	Apply documentation processes defined in the applicable SQAP and other Plans identified above.	See Plan Documentation above	See Plan Documentation above	See Plan Documentation above	See Plan Documentation above	See Plan Documentation above	
Training Process																	
Plan the Training Program	X	X	X					UA	12	Quality Assurance Plan for Digital Hardware and Software	Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 A/B/C/D	8 303 186 G	8 303 186 H	8 303 186 P, § 6.2.2	8 303 186 P, § 6.2.2	Training for Rolls-Royce and EDF staff are in place. Training for U.S. licensee staff will be planned in connection with each plant-specific project.
								Later	14	Quality Assurance Procedures for Digital Hardware and Software	Training New Team Members	1 207 104 A	1 207 104 A	1 207 104 A	Not applicable	Not applicable	
											Safety software design process [PRO_Concept_log_C] (formerly Software Design Control)	Not applicable	Not applicable	Not applicable	8 303 350 J	8 303 350 J	
											Training of personnel	8 303 321	8 303 321 E	8 303 321 E	8 303 321 J	8 303 321 J	
											Training of personnel for on-site activities	8 303 386	8 303 386 F	8 303 386 G	8 303 386 J	8 303 386 J	
											Customer training process	No information	No information	8 303 706 A	8 303 706 D	8 303 706 D	
											Software Guideline: Software V&V Team Training Plan [IL_Plan_Form_VV]	1 208 210 B	1 208 210 B	1 208 210 B	1 208 210 C	1 208 210 C	
											System Training Plan	Not applicable	Not applicable	Not applicable	Not applicable	8 307 242 A	This document is a plan template that will be completed for each plant-specific system.
Develop Training Materials	X	X	X	X	X					None	Apply processes defined in the applicable Training Plan	See above	See above	See above	See above	See above	A Training Center and training materials exist at the Rolls-Royce Meylan, France facility.
Validate the Training Program	X	X	X	X	X					None	Apply processes defined in the applicable Training Plan	See above	See above	See above	See above	See above	
Implement the Training Program	X	X	X	X	X	X	X			None	Apply processes defined in the applicable Training Plan	See above	See above	See above	See above	See above	

UA	=	Documents Expected Upon Application
Later	=	Documents Expected Within 12 Months of Requested Approval
Audit	=	Documents Available for Audit

Document submitted to NRC

Table 3a. Mapping <i>SPINLINE</i> 3 SQP MC3 and Other Content to IEEE 730-1998 SQAP Content Guidance							
IEEE 730-1998 Guidance			Where found in <i>SPINLINE</i> 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.1	1	Purpose: This section shall delineate the specific purpose and scope of the particular SQAP. It shall list the name(s) of the software items covered by the SQAP and the intended use of the software. It shall state the portion of the software life cycle covered by the SQAP for each software item specified.	SQP MC3	8 303 429 E	1	Purpose, Scope and Responsibilities	The MC3 SQP + supporting documents also performs the functions of the SCMP and SVVP.
			SDP MC3	1 207 102 A	1	Project Overview	This SDP supports the SQP MC3 with additional guidance for the MC3 project (for the original creation of <i>SPINLINE</i> 3). Some of the topics addressed in this SDP align with the SQAP content guidance in IEEE 730-1998.
					2	Description of the Project	
4.2	2	Referenced documents: This section shall provide a complete list of documents referenced elsewhere in the text of the SQAP	SQP MC3	8 303 429 E	2	Reference Documents and Applicable Documents	
					9.3	Rules	
4.3	3	Management: This section shall describe organization, tasks, and responsibilities	See 3.1 - 3.3 below				
4.3.1	3.1	Organization: This paragraph shall depict the organizational structure that influences and controls the quality of the software. This shall include a description of each major element of the organization together with the delegated responsibilities. Organizational dependence or independence of the elements responsible for SQA from those responsible for software development and use shall be clearly described or depicted	SQP MC3	8 303 429 E	4	Specific Organizational Structure Associated With Software Project	Refer to organization chart
4.3.2	3.2	Tasks: This paragraph shall describe a) That portion of the software life cycle covered by the SQAP; b) The tasks to be performed with special emphasis on software quality assurance activities; and c) The relationships between these tasks and the planned major checkpoints. The sequence of the tasks shall be indicated.	SQP MC3	8 303 429 E	5	Quality Control in the Design and Production of Software	
					9.1	Methods Applied	
			SDP MC3	1 207 102 A	2	Description of the Project	

Table 3a. Mapping <i>SPINLINE</i> 3 SQP MC3 and Other Content to IEEE 730-1998 SQAP Content Guidance							
IEEE 730-1998 Guidance			Where found in <i>SPINLINE</i> 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.3.3	3.3	Responsibilities: This paragraph shall identify the specific organizational elements responsible for each task.	SQP MC3	8 303 429 E	4.3	Duties of Members of the Software Team	
					7.4 & 8	Procedures for identification and entry into configuration; Management of changes to software and associated documentation	Software Project Manager is responsible for CM
4.4	4	Documentation	SQP MC3	8 303 429 E	6	Project Documentation	
			Guide to writing documentation	1 207 139			Referenced in SQP MC3 §6
			Document and data control	8 303 186			Referenced in SQP MC3 §6.3
4.4.1	4.1	Purpose: This section shall perform the following functions: a) Identify the documentation governing the development, verification and validation, use, and maintenance of the software. b) State how the documents are to be checked for adequacy. This shall include the criteria and the identification of the review or audit by which the adequacy of each document shall be confirmed, with reference to Section 6 of the SQAP.	SQP MC3	8 303 429 E	6.1	Project Management Documents	Refer to table of document responsibilities (writing, checking, approval)
					6.2	Documents specific to each software item embedded on a unit	Refer to table of document responsibilities (writing, checking, approval)
			Document drafting rules	1 207 103			Referenced in SQP MC3 §9.3
4.4.2	4.2	Minimum documentation requirements: To ensure that the implementation of the software satisfies requirements, the documentation in 4.4.2.1 through 4.4.2.6 is required as a minimum	SQP MC3	8 303 429 E	6.1	Project Management Documents	
4.4.2.1	4.2.1	Software Requirements Specification (SRS): The SRS shall clearly and precisely describe each of the essential requirements (functions, performances, design constraints, and attributes) of the software and the external interfaces. Each requirement shall be defined such that its achievement is capable of being objectively verified and validated by a prescribed method (e.g., inspection, analysis, demonstration, or test)	SQP MC3	8 303 429 E	6.2	Software Specifications (SRS)	
					9.1.1	Specifications	

Table 3a. Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.4.2.2	4.2.2	Software Design Description (SDD): The SDD shall depict how the software will be structured to satisfy the requirements in the SRS. The SDD shall describe the components and subcomponents of the software design, including databases and internal interfaces. The SDD shall be prepared first as the Preliminary SDD (also referred to as the top-level SDD) and shall be subsequently expanded to produce the Detailed SDD	SQP MC3	8 303 429 E	6.2	Preliminary Software Design (PSD), Detailed Software Design (DSD), Preliminary & Detailed Software Design (PDSD), Software component description file (BF or SAF), Software Production File (SPF), Software Validation Test Analysis (SVTP), Software Validation Test Reports (SVTR)	
					9.1.2	Preliminary Design and Detailed Design	
			Interface Specifications - Operational System Software and Application Software	1 207 110 J			Not referenced in SQP MC3, but applicable.
4.4.2.3	4.2.3	Software Verification and Validation Plan (SVVP): The SVVP shall identify and describe the methods (e.g., inspection, analysis, demonstration, or test) to be used to a1) Verify that the requirements in the SRS have been approved by an appropriate authority; a2) Verify that the requirements in the SRS are implemented in the design expressed in the SDD; and a3) Verify that the design expressed in the SDD is implemented in the code. b) Validate that the code, when executed, complies with the requirements expressed in the SRS	SQP MC3	8 303 429 E	5	Quality Control in the Design and Production of Software	There is no separate SVVP. The SQP MC3, SVTP and subordinate V&V guidance documents perform the function of the SVVP.
					9.1.6	Software Validation	
			SVTP	1 207 146 G		Software Validation Test Plan (SVTP) - Operational System Software for Safety Class Units	SVTP is referenced in SQP MC3 §5.3, 6.2, 9.1 & 10.2.2.4
			Rules for Verification/Validation of Software Components	1 207 107			Referenced in SQP MC3 §9.3
4.4.2.4	4.2.4	Software Verification and Validation Report (SVVR): The SVVR shall describe the results of the execution of the SVVP.	SVTR	1 207 232 F		Software Validation Test Report (SVTR) - Operational System Software for Safety Class Units	SVTR is referenced in SQP MC3 §5.3, 6.2, 9.1 & 10.2.2.4

Table 3a. Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.4.2.5	4.2.5	User documentation: User documentation (e.g., manual, guide) shall specify and describe the required data and control inputs, input sequences, options, program limitations, and other activities or items necessary for successful execution of the software. All error messages shall be identified and corrective actions shall be described. A method of describing user identified errors or problems to the developer or the owner of the software shall be described. (Embedded software that has no direct user interaction has no need for user documentation and is therefore exempted from this requirement.)	SQP MC3	8 303 429 E	6.2	Software User Manual (SUM)	
4.4.2.6	4.2.6	Software Configuration Management Plan (SCMP): The SCMP shall document methods to be used for identifying software items, controlling and implementing changes, and recording and reporting change implementation status	SQP MC3	8 303 429 E	7	Configuration Management	CM is addressed in the MC3 SQP and supporting documents. There is no separate SCMP
					8	Management of Changes to Software and Associated Documentation	
			Upgrade management	8 303 197			Referenced in SQP MC3 §8
			Software maintenance and changes	1 206 624			Referenced in SQP MC3 §8
4.4.3	4.3	Other: Other documentation may include the following: a) Software Development Plan; b) Standards and Procedures Manual; c) Software Project Management Plan; d) Software Maintenance Manual	SDP MC3	8 303 429 E			
			Design control	8 303 334			Referenced in SQP MC3 §9.3
			Software design control	8 303 350			Referenced in SQP MC3 §9.3
			Development of safety class software	1 206 076			Referenced in SQP MC3 §9.3
			Development of standard software	1 206 077			Referenced in SQP MC3 §9.3
			Software Quality Assurance Handbook	8 303 670			Referenced in SQP MC3 §9.3
4.5	5	Standards, practices, conventions, and metrics	SQP MC3	8 303 429 E	5	Quality Control in the Design and Production of Software	
					9	Methods, Tools and Rules	

Table 3a. Mapping *SPINLINE 3* SQP MC3 and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in <i>SPINLINE 3</i> generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.5.1	5.1	Purpose: This section shall a) Identify the standards, practices, conventions, and metrics to be applied; b) State how compliance with these items is to be monitored and assured.	SQP MC3	8 303 429 E	2.1	Reference Documents	
					5.1	Procedure used for software development	Refer to the diagram for the software development life cycle
					5.2	Development process for software incorporating HMIs	Refer to diagram showing the development cycle for software with HMI
					9.3	Rules	
4.5.2	5.2	Content: The subjects covered shall include the basic technical, design, and programming activities involved, such as documentation, variable and module naming, programming, inspection, and testing	SQP MC3	8 303 429 E	5.3	Description of phases 1) Specification phase 2) Preliminary Design Phase 3) Detailed design phase 4) Production phase (coding and unit tests) 5) Integration phase 6) Validation phase 7) System tests	For each phase, identifies phase inputs, phase outputs and conditions for moving to the next phase
					10.3	Quality Monitoring Documentation	
4.6	6	Reviews and audits	SQP MC3	8 303 429 E	10	Quality Assurance Measures	
4.6.1	6.1	Purpose: This section shall a) Define the technical and managerial reviews and audits to be conducted; b) State how the reviews and audits are to be accomplished; c) State what further actions are required and how they are to be implemented and verified.	SES Department Quality Assurance Manual	8 303 186	8.2.2	Internal audits	Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]
			SQP MC3	8 303 429 E	10.1	Principles	

Table 3a. Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.6.2	6.2	Minimum requirements: a) Software Requirements Review (SRR) b) Preliminary Design Review (PDR) c) Critical Design Review (CDR) d) Software Verification and Validation Plan Review (SVVPR) e) Functional audit f) Physical audit g) In-process audits h) Managerial reviews i) Software Configuration Management Plan Review (SCMPR) j) Post-mortem review	SQP MC3	8 303 429 E	10.2	Quality Actions	Quality Actions, including: a) End of phase reviews b) Document design reviews, including: - Software specification design review - Software preliminary design document review - Software detailed design document review - Software validation test documentation design review c) Document peer review d) Audits
					10.3	Quality Monitoring Documentation	
4.6.3	6.3	Other: Other reviews and audits may include the user documentation review (UDR). This review is held to evaluate the adequacy (e.g., completeness, clarity, correctness, and usability) of user documentation.	SQP MC3	8 303 429 E	10.2.3	Documentation Peer Review	
4.7	7	Test: This section shall identify all the tests not included in the SVVP for the software covered by the SQAP and shall state the methods to be used	SQP MC3	8 303 429 E	9.1.4	Unit tests on software components	
					9.1.5	Software integration tests	
4.8	8	Problem reporting and corrective action: This section shall a) Describe the practices and procedures to be followed for reporting, tracking, and resolving problems identified in both software items and the software development and maintenance process; b) State the specific organizational responsibilities concerned with their implementation.	SES Department Quality Assurance Manual	8 303 186	8.3	Control of nonconforming product	Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]
			SQP MC3	8 303 429 E	1.2.5	Procedure in the event of failure to apply the SQP	
			Software maintenance and changes	1 206 624			Referenced in SQP MC3 §8
4.9	9	Tools, techniques, and methodologies: This section shall identify the special software tools, techniques, and methodologies that support SQA, state their purposes, and describe their use	SQP MC3	8 303 429 E	9	Methods, Tools and Rules	
			List of tools and libraries used by software	1 207 286			Referenced in SQP MC3 §9.2.2

Table 3a. Mapping <i>SPINLINE</i> 3 SQP MC3 and Other Content to IEEE 730-1998 SQAP Content Guidance							
IEEE 730-1998 Guidance			Where found in <i>SPINLINE</i> 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.10	10	Code control: This section shall define the methods and facilities used to maintain, store, secure, and document controlled versions of the identified software during all phases of the software life cycle. This may be implemented in conjunction with a computer program library. This may be provided as a part of the SCMP. If so, an appropriate reference shall be made thereto	SQP MC3	8 303 429 E	9.1.3	Coding	
			Software Instructions Handbook	8 303 670			Referenced in SQP MC3 §2.1
			Rules for programming in C	1 207 106			Referenced in SQP MC3 §9.3
			Defensive programming application rules	1 207 185			Referenced in SQP MC3 §9.3
			Development environment organization	1 207 105			Referenced in SQP MC3 §9.3
			Basic and system access function management	1 207 195			Referenced in SQP MC3 §9.3
4.11	11	Media control: This section shall state the methods and facilities to be used to a) Identify the media for each computer product and the documentation required to store the media, including the copy and restore process; and b) Protect computer program physical media from unauthorized access or inadvertent damage or degradation during all phases of the software life cycle. This may be provided as a part of the SCMP. If so, an appropriate reference shall be made thereto.	SQP MC3	8 303 429 E	11	Reproduction, Protection, Delivery	
4.12	12	Supplier control: This section shall state the provisions for assuring that software provided by suppliers meets established requirements. In addition, this section shall state the methods that will be used to assure that the software supplier receives adequate and complete requirements. For previously developed software, this section shall state the methods to be used to assure the suitability of the product for use with the software items covered by the SQAP. For software that is to be developed, the supplier shall be required to prepare and implement an SQAP in accordance with this standard. This section shall also state the methods to be employed to assure that the developers comply with the requirements of this standard.	SES Department Quality Assurance Manual	8 303 186	7.4	Purchasing	Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]

Table 3a. Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 730-1998 SQAP Content Guidance							
IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.13	13	Records collection, maintenance, and retention: This section shall identify the SQA documentation to be retained; shall state the methods and facilities to be used to assemble, safeguard, and maintain this documentation; and shall designate the retention period.	SES Department Quality Assurance Manual	8 303 186	4.2	QMS Documents	Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]
			SQP MC3	8 303 429 E	1.2.4	Revision of the SQP	
					10.3	Quality Monitoring Documentation	
4.14	14	Training: This section shall identify the training activities necessary to meet the needs of the SQAP	SES Department Quality Assurance Manual	8 303 186	6.6.2	Competence, awareness and training	Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]
			Training New Team Members	1 207 104			Referenced in SQP MC3 §9.3
4.15	15	Risk management: This section shall specify the methods and procedures employed to identify, assess, monitor, and control areas of risk arising during the portion of the software life cycle covered by the SQAP	SES Department Quality Assurance Manual	8 303 186	4.2.4, 5.3, 7.0, 7.4.1, 7.5.5, 8.5.3,	Embedded in quality management system processes. No separate section on risk management.	Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]
			SDP MC3	1 207 102 A	8	Risk Assessment	
No counterpart in IEEE 730			SQP MC3	8 303 429 E	3	Terminology, Abbreviations and Acronyms	
					5.1, 5.2, 5.3.6, 9.1.6	Definition of V&V activities embedded in SQP processes	

Index of SPINLINE 3 Life Cycle Documents Listed in Table 3a				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
Development of safety class software	1 206 076			Referenced in SQP MC3 §9.3
Development of standard software	1 206 077			Referenced in SQP MC3 §9.3
Software maintenance and changes	1 206 624			Referenced in SQP MC3 §8
General software specifications (CSS)	1 207 101			Referenced in SQP MC3 §2.1
SDP MC3	1 207 102 A		Software Development Plan	
Document drafting rules	1 207 103			Referenced in SQP MC3 §9.3
Development environment organization	1 207 105			Referenced in SQP MC3 §9.3
Rules for programming in C	1 207 106			Referenced in SQP MC3 §9.3
Rules for Verification/Validation of Software Components	1 207 107			Referenced in SQP MC3 §9.3
Guide to writing documentation	1 207 139			Referenced in SQP MC3 §6
SVTP	1 207 146 G		Software Validation Test Plan (SVTP) - Operational System Software for Safety Class Units	
Defensive programming application rules	1 207 185			Referenced in SQP MC3 §9.3
Basic and system access function management	1 207 195			Referenced in SQP MC3 §9.3
List of tools and libraries used by software	1 207 286			Referenced in SQP MC3 §9.2.2
SVTR	1 207 232 F		Software Validation Test Report (SVTR) - Operational System Software for Safety Class Units	
Project Development Plan	6 615 35			Referenced in SQP MC3 §2.1

Index of SPINLINE 3 Life Cycle Documents Listed in Table 3a				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
Document and data control	8 303 186			Referenced in SQP MC3 §6.3
SES Department Quality Assurance Manual	8 303 186			Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM], document 8 303 186 P
Upgrade management	8 303 197			Referenced in SQP MC3 §8
Contract Function Quality Assurance Manual	8 303 311			Referenced in SQP MC3 §2.1
Design control	8 303 334			Referenced in SQP MC3 §9.3
Software design control	8 303 350			Referenced in SQP MC3 §9.3
SQP MC3	8 303 429 E		Software Quality Plan (SQP) - MC3	
Engineering Function Quality Assurance Manual	8 303 667			Referenced in SQP MC3 §2.1
Software Instructions Handbook	8 303 670			Referenced in SQP MC3 §2.1
Software Quality Assurance Handbook	8 303 670			Referenced in SQP MC3 §9.3
General software specifications - Amendment no. 1,	9 437 049			Referenced in SQP MC3 §2.1
Cooperation agreement for the development and improvement of nuclear power station reactor instrumentation and control systems	TA 93061 (2/08/93)			Referenced in SQP MC3 §2.1

Table 3b. Mapping *SPINLINE 3* SMQP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.1	1	Purpose: This section shall delineate the specific purpose and scope of the particular SQAP. It shall list the name(s) of the software items covered by the SQAP and the intended use of the software. It shall state the portion of the software life cycle covered by the SQAP for each software item specified.	SMQP	1 208 686 B	1.1 & 1.2	Purpose of Document; Scope of Application	This SMQP, document 1 208 686 B, is the standard SQAP that is used in connection with modifications to the generic <i>SPINLINE 3</i> platform software. Modifications may be made on occasion to improve this platform software. This SQMP applies only to the modification phase of the software life cycle. When a modification is needed, a project-specific SDP provides the project-specific guidance for that modification effort. Modification of the platform software typically is not required for plant-specific <i>SPINLINE 3</i> systems.
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	1.1	Origin and objectives of the project	Use of a separate SDP for each modification project is explained in SMQP §1.2.1
					1.2	Contract Clauses	
4.2	2	Referenced documents: This section shall provide a complete list of documents referenced elsewhere in the text of the SQAP	SMQP	1 208 686 B	2	Applicable Documents and Reference Documents	
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	1.3	Technical reference documents	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
4.3	3	Management: This section shall describe organization, tasks, and responsibilities	SMQP	1 208 686 B	5	Management of SPINLINE 3 Software Modification	
			[IL_Gest_Proj]	1 208 055 E		Software Project Management Process Instruction	Referenced in SQMP §5.1
4.3.1	3.1	Organization: This paragraph shall depict the organizational structure that influences and controls the quality of the software. This shall include a description of each major element of the organization together with the delegated responsibilities. Organizational dependence or independence of the elements responsible for SQA from those responsible for software development and use shall be clearly described or depicted	SMQP	1 208 686 B	4	Organization	
			Development environment organization	1 207 105			Referenced in SMQP §8.4
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	5	Organization	Use of a separate SDP for each modification project is explained in SQMP §1.2.1

Table 3b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.3.2	3.2	Tasks: This paragraph shall describe a) That portion of the software life cycle covered by the SQAP; b) The tasks to be performed with special emphasis on software quality assurance activities; and c) The relationships between these tasks and the planned major checkpoints. The sequence of the tasks shall be indicated.	SMQP	1 208 686 B	1.2	Scope of Application	
					5.2	SPINLINE 3 Software Modification Process	Process flow charts provide an integrated view of the software modification process.
			[PRO_Concept_log_C]	8 303 350 K		Safety software design process	Referenced in SQMP §5.2
			[PRO_Concept_log_NC]	8 307 214 B		Non safety software design process	Referenced in SQMP §5.2
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	2	Description of the Project	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
					2.1	Technical tree	
					2.2	Software development cycle retained	
					2.3	Flowchart of tasks	
4.3.3	3.3	Responsibilities: This paragraph shall identify the specific organizational elements responsible for each task.	SMQP	1 208 686 B	1.3	Responsibilities and changes to Quality Plan	
					4	Organization	
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	3.4	Management Activities	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
4.4	4	Documentation	SMQP	1 208 686 B	6	Documentation	
			[Pro_Etab_Doc]	8 303 198 P		Procedure: Establishment and application of engineering documents	Referenced in SMQP §6
			[Gest_Doc_Col_Ref]	8 303 638 B		Documents and reference files management	Referenced in SMQP §6 & 10

Table 3b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.4.1	4.1	Purpose: This section shall perform the following functions: a) Identify the documentation governing the development, verification and validation, use, and maintenance of the software. b) State how the documents are to be checked for adequacy. This shall include the criteria and the identification of the review or audit by which the adequacy of each document shall be confirmed, with reference to Section 6 of the SQAP.	SMQP	1 208 686 B	11.1.2	Document Control	
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	3.3.1	Document control	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
4.4.2	4.2	Minimum documentation requirements : To ensure that the implementation of the software satisfies requirements, the documentation in 4.4.2.1 through 4.4.2.6 is required as a minimum	See 4.2.1 - 4.2.6 below.				This SMQP applies to modification to the generic platform software and associated documentation.
4.4.2.1	4.2.1	Software Requirements Specification (SRS) : The SRS shall clearly and precisely describe each of the essential requirements (functions, performances, design constraints, and attributes) of the software and the external interfaces. Each requirement shall be defined such that its achievement is capable of being objectively verified and validated by a prescribed method (e.g., inspection, analysis, demonstration, or test)	SRS	1 207 108 J		Software Requirement Specification - Operational System Software	SRS may be updated in connection with the software modification. See SMQP §5.2.
			Interface Specifications - Operational System Software and Application Software	1 207 110 J			Not referenced in SMQP, but applicable.
4.4.2.2	4.2.2	Software Design Description (SDD): The SDD shall depict how the software will be structured to satisfy the requirements in the SRS. The SDD shall describe the components and subcomponents of the software design, including databases and internal interfaces. The SDD shall be prepared first as the Preliminary SDD (also referred to as the top-level SDD) and shall be subsequently expanded to produce the Detailed SDD	SDD	1 207 141 H		Software Preliminary Design - Core System Software	SDD or similar documents may be updated in connection with the software modification. See SMQP §5.2.

Table 3b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.4.2.3	4.2.3	Software Verification and Validation Plan (SVVP): The SVVP shall identify and describe the methods (e.g., inspection, analysis, demonstration, or test) to be used to a1) Verify that the requirements in the SRS have been approved by an appropriate authority; a2) Verify that the requirements in the SRS are implemented in the design expressed in the SDD; and a3) Verify that the design expressed in the SDD is implemented in the code. b) Validate that the code, when executed, complies with the requirements expressed in the SRS	SMQP	1 208 686 B	8.2.4	Unit tests of software components (includes Static Code Analysis & Functional Validation)	There is no separate SVVP. This SMQP, SVTP and subordinate V&V guidance documents perform the function of the SVVP.
					8.2.6	Software Validation	
					11.1.1	Phase reviews	
			SVTP	1 207 146 G		Software Validation Test Plan (SVTP) - Operational System Software for Safety Class Units	SVTP is referenced in SMQP §8.2.6. SVTP may be updated in connection with the software modification.
			Rules for Verification & Validation of software components	1 207 107			Referenced in SMQP §8.4
			[PGCL_SPINLINE 3]	1 208 878 D		SPINLINE 3 Software Configuration Management Plan	Referenced in SMQP §7. This SCMP may be updated in connection with the software modification. See SMQP §5.2.
4.4.2.4	4.2.4	Software Verification and Validation Report (SVVR): The SVVR shall describe the results of the execution of the SVVP.	SVTR	1 207 232 F		Software Validation Test Report (SVTR) - Operational System Software for Safety Class Units	SVTR is referenced in SMQP §8.2.6. SVTR may be updated in connection with the software modification.
4.4.2.5	4.2.5	User documentation: User documentation (e.g., manual, guide) shall specify and describe the required data and control inputs, input sequences, options, program limitations, and other activities or items necessary for successful execution of the software. All error messages shall be identified and corrective actions shall be described. A method of describing user identified errors or problems to the developer or the owner of the software shall be described. (Embedded software that has no direct user interaction has no need for user documentation and is therefore exempted from this requirement.)	Software User Manual (SUM) already exists				User documents may be updated in connection with the software modification. See SMQP §5.2.

Table 3b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.4.2.6	4.2.6	Software Configuration Management Plan (SCMP): The SCMP shall document methods to be used for identifying software items, controlling and implementing changes, and recording and reporting change implementation status	SMQP	1 208 686 B	7	Configuration Management	Invokes CM process in [IL_Gest_Conf] and [PGCL_SPINLINE 3]
			[PGCL_SPINLINE 3]	1 208 878 D		SPINLINE 3 Software Configuration Management Plan	Referenced in SMQP §7. This SCMP may be updated in connection with the software modification. See SMQP §5.2.
			[IL_Gest_Conf].	1 207 875 F		Software Configuration Management Process	Referenced in SMQP §7
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	3.5	Configuration management activities and changes	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
4.4.3	4.3	Other: Other documentation may include the following: a) Software Development Plan; b) Standards and Procedures Manual; c) Software Project Management Plan; d) Software Maintenance Manual	Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A			Use of a separate SDP for each modification project is explained in SQMP §1.2.1
4.5	5	Standards, practices, conventions, and metrics	SMQP	1 208 686 B	8	Methods, Tools and Rules	Also see Tools, techniques, and methodologies
4.5.1	5.1	Purpose: This section shall a) Identify the standards, practices, conventions, and metrics to be applied; b) State how compliance with these items is to be monitored and assured.	See 5.2 below				

Table 3b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.5.2	5.2	Content: The subjects covered shall include the basic technical, design, and programming activities involved, such as documentation, variable and module naming, programming, inspection, and testing	[PRO_Concept_log_C]	8 303 350 K		Safety software design process	Referenced in SMQP §5.2 & 8.1
			[PRO_Concept_log_NC]	8 307 214 B		Non safety software design process	Referenced in SMQP §5.2 & 8.1
			[LOBUL_SL3]	1 207 286		List of Tools and Libraries used for the Software - SPINLINE 3	Referenced in SMQP §8.2 & 8.3
			Rules for Verification & Validation of safety class software components	1 207 107			Referenced in SMQP §8.2 & 8.4
			Development environment organization	1 207 105			Referenced in SMQP §8.4
			Basic functions and system access functions management	1 207 195			Referenced in SMQP §8.4
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	3	Rules, Methods and Tools	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
					3.1	Development activities	
					3.2	Test Activities	
					3.3	Control Activities	
4.6	6	Reviews and audits	See 4.6.1 - 4.6.3 below				
4.6.1	6.1	Purpose: This section shall a) Define the technical and managerial reviews and audits to be conducted; b) State how the reviews and audits are to be accomplished; c) State what further actions are required and how they are to be implemented and verified.	Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P	8.2.2	Internal audits	Not referenced in SMQP, but applicable.
			SMQP	1 208 686 B	11	Monitoring Application of the Quality Plan	

Table 3b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.6.2	6.2	Minimum requirements: a) Software Requirements Review (SRR) b) Preliminary Design Review (PDR) c) Critical Design Review (CDR) d) Software Verification and Validation Plan Review (SVVPR) e) Functional audit f) Physical audit g) In-process audits h) Managerial reviews i) Software Configuration Management Plan Review (SCMPR) j) Post-mortem review	SMQP	1 208 686 B	11.1	Quality Actions: Typical Quality Assurance actions are: – Phase reviews, – Document control ⇒ document reviews, ⇒ peer reviews, – Regular monitoring of the Quality File.	
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	3.3.2	Audits	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
4.6.3	6.3	Other: Other reviews and audits may include the user documentation review (UDR). This review is held to evaluate the adequacy (e.g., completeness, clarity, correctness, and usability) of user documentation.	[Gest_Doc_Col_Ref]	8 303 638 B		Documents and reference files management	Referenced in SMQP §10
4.7	7	Test: This section shall identify all the tests not included in the SVVP for the software covered by the SQAP and shall state the methods to be used	SMQP	1 208 686 B	8.2.4	Unit tests on software components	
					8.2.5	Software integration tests	
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	3.2	Test Activities	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
			Rules for Verification & Validation of safety class software components	1 207 107			Referenced in SMQP §8
			SITR	1 207 204 E		Software Integration Test Plan and Report (SITR) - SCC (Core System Software)	SIT is described in SMQP §6.2.5

Table 3b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.8	8	Problem reporting and corrective action: This section shall a) Describe the practices and procedures to be followed for reporting, tracking, and resolving problems identified in both software items and the software development and maintenance process; b) State the specific organizational responsibilities concerned with their implementation.	Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P	8.3	Control of nonconforming product	Not referenced in SMQP, but applicable.
			[IL_Gest_Conf]	1 207 875 F		Software Configuration Management Process	Referenced in SMQP §7
			[PRO_Concept_log_C]	8 303 350 K		Safety software design process	Referenced in SMQP §5.2.1 & 8.1
4.9	9	Tools, techniques, and methodologies: This section shall identify the special software tools, techniques, and methodologies that support SQA, state their purposes, and describe their use	SMQP	1 208 686 B	8	Methods, Tools and Rules	See details above, mapped to "Standards, practices, conventions, and metrics"
4.10	10	Code control: This section shall define the methods and facilities used to maintain, store, secure, and document controlled versions of the identified software during all phases of the software life cycle. This may be implemented in conjunction with a computer program library. This may be provided as a part of the SCMP. If so, an appropriate reference shall be made thereto	SMQP	1 208 686 B	5.2.1	Upgrade campaign control process	
					5.2.2	Process for upgrading and technical management of a SPINLINE 3 software component	
					8.2.3	Coding	
					8.4	Rules	
			[LOBUL_SL3]	1 207 286		List of Tools and Libraries used for the Software - SPINLINE 3	Referenced in SMQP §8.2 & 8.3
			Basic functions and system access functions management	1 207 195			Referenced in SMQP §8.4
			[PRO_Concept_log_C]	8 303 350 K		Safety software design process	Referenced in SMQP §5.2.1 & 8.1
			[PRO_Concept_log_NC]	8 307 214 B		Non safety software design process	Referenced in SMQP §5.2.1 & 8.1

Table 3b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.11	11	Media control: This section shall state the methods and facilities to be used to a) Identify the media for each computer product and the documentation required to store the media, including the copy and restore process; and b) Protect computer program physical media from unauthorized access or inadvertent damage or degradation during all phases of the software life cycle. This may be provided as a part of the SCMP. If so, an appropriate reference shall be made thereto.	SMQP	1 208 686 B	10	Reproduction, Protection, Delivery	This section of the SMQP also addresses document control.
			[Reg_SLI]	1 204 971 G		Information Technology Support functioning rules	Referenced in SMQP §10
4.12	12	Supplier control: This section shall state the provisions for assuring that software provided by suppliers meets established requirements. In addition, this section shall state the methods that will be used to assure that the software supplier receives adequate and complete requirements. For previously developed software, this section shall state the methods to be used to assure the suitability of the product for use with the software items covered by the SQAP. For software that is to be developed, the supplier shall be required to prepare and implement an SQAP in accordance with this standard. This section shall also state the methods to be employed to assure that the developers comply with the requirements of this standard.	Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P	7.4	Purchasing	Not referenced in SMQP, but applicable.
			SMQP	1 208 686 B	9	Monitoring Suppliers	There are no subcontractors
			[IL_Outils]	1 206 747 E		Software Instruction: Requirements on software development tools	Referenced in SMQP §9.2
			[IL_Ctrl_log_Ext]	8 303 671 B		Software Instruction: External software reception control	Referenced in SMQP §9.2
4.13	13	Records collection, maintenance, and retention: This section shall identify the SQA documentation to be retained; shall state the methods and facilities to be used to assemble, safeguard, and maintain this documentation; and shall designate the retention period.	Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P	4.2	QMS Documents	Not referenced in SMQP, but applicable.
			SMQP	1 208 686 B	10	Reproduction, Protection, Delivery	
					11.3	Quality-related records	
			[Gest_Doc_Col_Ref]	8 303 638 B		Documents and reference files management	Referenced in SMQP §6 & 10
			[Reg_SLI]	1 204 971			Referenced in SMQP § 2
			[Mait_Enr]	8 303 320 L		Procedure: Control of records	Referenced in SMQP §10

Table 3b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.14	14	Training: This section shall identify the training activities necessary to meet the needs of the SQAP	Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P	6.6.2	Competence, awareness and training	Not referenced in SMQP, but applicable.
			[IL_Plan_Form_VV]	1 208 210 C		Software Guideline: Software V&V Team Training Plan	Not referenced in SMQP, but applicable.
			[PRO_Concept_log_C]	8 303 350 K		Safety software design process	Referenced in SMQP §5.2.1 & 8.1
			[PRO_Concept_log_NC]	8 307 214 B		Non safety software design process	Referenced in SMQP §5.2.1 & 8.1
4.15	15	Risk management: This section shall specify the methods and procedures employed to identify, assess, monitor, and control areas of risk arising during the portion of the software life cycle covered by the SQAP	Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P	4.2.4, 5.3, 7.0, 7.4.1, 7.5.5, 8.5.3,	Embedded in quality management system processes. No separate section on risk management.	Not referenced in SMQP, but applicable.
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	8	Risk Analysis	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
No counterpart in IEEE 730			SMQP	1 208 686 B	3	Terminology and Abbreviations	
					5.1	Budget and schedule control	Invokes process in [IL_Gest_Proj]
					11.2	Scheduling Quality Assurance actions	
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	4	Means (Resources)	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
					4.1	Material means	
					4.2	Software means	
					4.3	Human means	
					9.1	Planning	
					9.2	Table of costs	

Index of SPINLINE 3 Life Cycle Documents Listed in Table 3b				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
[Reg_SLI]	1 204 971 G		Information Technology Support functioning rules	Referenced in SMQP and SQP "Software Quality Assurance Handbook", document. 8 303 670
[IL_Outils]	1 206 747 E		Software Instruction: Requirements on software development tools	Referenced in SMQP §9.2
Development environment organization	1 207 105			Referenced in SMQP §8.4
Rules for Verification & Validation of software components	1 207 107			Referenced in SMQP §8
SRS	1 207 108 J		Software Requirement Specification - Operational System Software	SRS may be updated in connection with the software modification. See SMQP §5.2.
Interface Specifications - Operational System Software and Application Software	1 207 110 J			Not referenced in SMQP, but applicable.
Software Preliminary Design - Core System Software	1 207 141 H			
SVTP	1 207 146 G		Software Validation Test Plan (SVTP) - Operational System Software for Safety Class Units	
Basic functions and system access functions management	1 207 195			Referenced in SMQP §8.4
SITR	1 207 204 E		Software Integration Test Plan and Report (SITR) - SCC (Core System Software)	
SVTR	1 207 232 F		Software Validation Test Report (SVTR) - Operational System Software for Safety Class Units	
[LOBUL_SL3]	1 207 286		List of Tools and Libraries used for the Software - SPINLINE 3	Referenced in SMQP §8.2 & 8.3
[IL_Gest_Conf]	1 207 875 F		Software Configuration Management Process	Referenced in SMQP §7
[IL_Gest_Proj]	1 208 055 E		Software Instruction: Software project management process	Referenced in SQMP §5.1

Index of SPINLINE 3 Life Cycle Documents Listed in Table 3b				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
SDP 2000 Changes	1 208 645 A			Software Development Plan. Per SQMP §1.2.1, a specific Software Development Plan is created for each upgrade campaign
SMQP	1 208 686 B		Software Modification Quality Plan	
[PGCL_SPINLINE 3]	1 208 878 D		SPINLINE 3 Software Configuration Management Plan	
SDP 2001 Changes	1 208 908 A			Software Development Plan. Per SQMP §1.2.1, a specific Software Development Plan is created for each upgrade campaign
Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P			Not referenced in SMQP, but applicable.
[Pro_Etab_Doc]	8 303 198 P		Procedure: Establishment and application of engineering documents	Referenced in SMQP §6
[Mait_Enr]	8 303 320 L		Procedure: Control of records	Referenced in SMQP §10
[PRO_Concept_log_C]	8 303 350 K		Safety Software Design Process	Referenced in SMQP §5.2.1 & 8.1
[Gest_Doc_Col_Ref]	8 303 638 B		Documents and reference files management	Referenced in SMQP §10
[IL_Ctrl_log_Ext]	8 303 671 B		Software Instruction: External software reception control	Referenced in SMQP §9.2
[PRO_Concept_log_NC]	8 307 214 B		Non Safety Software Design Process	Referenced in SMQP §5.2.1 & 8.1

Table 3c. Mapping SPINLINE 3 Application SQAP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
4.1	1	Purpose: This section shall delineate the specific purpose and scope of the particular SQAP. It shall list the name(s) of the software items covered by the SQAP and the intended use of the software. It shall state the portion of the software life cycle covered by the SQAP for each software item specified.	SQAP	8 307 208 B	1.1 & 1.2	Purpose	Note that SQAP, document 8 307 208 B, is a generic template that establishes the framework for completing the SQAP for plant-specific application software that will interface with the SPINLINE 3 generic platform software.
4.2	2	Referenced documents: This section shall provide a complete list of documents referenced elsewhere in the text of the SQAP	SQAP	8 307 208 B	2	Reference Documents	
4.3	3	Management: This section shall describe organization, tasks, and responsibilities	SQAP	8 307 208 B	3	Management	
			[IL_Gest_Proj]	1 208 055 E		Software Project Management Process Instruction	Referenced in SMQP §5.1
4.3.1	3.1	Organization: This paragraph shall depict the organizational structure that influences and controls the quality of the software. This shall include a description of each major element of the organization together with the delegated responsibilities. Organizational dependence or independence of the elements responsible for SQA from those responsible for software development and use shall be clearly described or depicted	SQAP	8 307 208 B	3.1	Organization	
4.3.2	3.2	Tasks: This paragraph shall describe a) That portion of the software life cycle covered by the SQAP; b) The tasks to be performed with special emphasis on software quality assurance activities; and c) The relationships between these tasks and the planned major checkpoints. The sequence of the tasks shall be indicated.	SQAP	8 307 208 B	3.2	Tasks	
					3.2.1	Software life Cycle Overview	Figure provides an integrated view of software activities in each life cycle phase
					3.2.1.1	Document Relationship in the Software Life Cycle	Figure provides an integrated view input and output documents in each life cycle phase
					3.2.2	Software Management Activities	
					3.2.3	Software Development Activities	
					3.2.4	Software Safety and Security Activities	
					3.2.5	Software Verification and Validation Activities	
					3.2.6	Software Configuration Management Activities	
					3.2.7	Software Quality Assurance Activities	

Table 3c. Mapping SPINLINE 3 Application SQAP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
4.3.3	3.3	Responsibilities: This paragraph shall identify the specific organizational elements responsible for each task.	SQAP	8 307 208 B	1.4	Creation and Update of the SQAP	
					3.1, 3.3	Organization; Responsibilities	
					4.8	Summary of Engineering Documents and Associated Responsibilities	
4.4	4	Documentation	SQAP	8 307 208 B	4	Documentation	
					4.8	Summary of Engineering Documents and Associated Responsibilities	
4.4.1	4.1	Purpose: This section shall perform the following functions: a) Identify the documentation governing the development, verification and validation, use, and maintenance of the software. b) State how the documents are to be checked for adequacy. This shall include the criteria and the identification of the review or audit by which the adequacy of each document shall be confirmed, with reference to Section 6 of the SQAP.	SQAP	8 307 208 B	4.1	Introduction	
					4.8	Summary of Engineering Documents and Associated Responsibilities	
4.4.2	4.2	Minimum documentation requirements : To ensure that the implementation of the software satisfies requirements, the documentation in 4.4.2.1 through 4.4.2.6 is required as a minimum	SQAP	8 307 208 B	4.2 to 4.8		
4.4.2.1	4.2.1	Software Requirements Specification (SRS): The SRS shall clearly and precisely describe each of the essential requirements (functions, performances, design constraints, and attributes) of the software and the external interfaces. Each requirement shall be defined such that its achievement is capable of being objectively verified and validated by a prescribed method (e.g., inspection, analysis, demonstration, or test)	SQAP	8 307 208 B	4.3	Software Requirements Specification (SRS)	
			[IL_GD_CCL]	1 207 854 B		Software Guideline: SRS Documentation Guideline	Referenced in SQAP §2
4.4.2.2	4.2.2	Software Design Description (SDD): The SDD shall depict how the software will be structured to satisfy the requirements in the SRS. The SDD shall describe the components and subcomponents of the software design, including databases and internal interfaces. The SDD shall be prepared first as the Preliminary SDD (also referred to as the top-level SDD) and shall be subsequently expanded to produce the Detailed SDD	SQAP	8 307 208 B	4.3	Software Design Description (SDD)	

Table 3c. Mapping SPINLINE 3 Application SQAP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
4.4.2.3	4.2.3	Software Verification and Validation Plan (SVVP): The SVVP shall identify and describe the methods (e.g., inspection, analysis, demonstration, or test) to be used to a1) Verify that the requirements in the SRS have been approved by an appropriate authority; a2) Verify that the requirements in the SRS are implemented in the design expressed in the SDD; and a3) Verify that the design expressed in the SDD is implemented in the code. b) Validate that the code, when executed, complies with the requirements expressed in the SRS	SQAP	8 307 208 B	4.4, 4.5	Software Verification and Validation Plan (SVVP)	
					4.5	Software Validation Test Plan (SVTP)	
						Software Validation Test Plan and Report (SVTPR)	
						Software Integration Test Plan and Report (SITPR)	
4.4.2.4	4.2.4	Software Verification and Validation Report (SVVR): The SVVR shall describe the results of the execution of the SVVP.	SQAP	8 307 208 B	4.5	Verification and Validation Documents, listed below:	
						Verification Report	
						Software Validation Test Report (SVTR)	
						Software Validation Test Plan and Report (SVTPR)	
						Software Integration Test Plan and Report (SITPR)	
						Software Component Test Description and Report	
						V&V Final Report (VVFR)	
4.4.2.5	4.2.5	User documentation: User documentation (e.g., manual, guide) shall specify and describe the required data and control inputs, input sequences, options, program limitations, and other activities or items necessary for successful execution of the software. All error messages shall be identified and corrective actions shall be described. A method of describing user identified errors or problems to the developer or the owner of the software shall be described. (Embedded software that has no direct user interaction has no need for user documentation and is therefore exempted from this requirement.)	SQAP	8 307 208 B	4.3	Software User Documentation	

Table 3c. Mapping SPINLINE 3 Application SQAP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
4.4.2.6	4.2.6	Software Configuration Management Plan (SCMP): The SCMP shall document methods to be used for identifying software items, controlling and implementing changes, and recording and reporting change implementation status	SQAP	8 307 208 B	4.6	Configuration Management Documents, listed below:	
						Software Configuration Management Plan (SCMP)	
						List of Software Documents (LSD)	
						Software Manufacturing File (SMF)	
						Software Configuration Management Report (SCMR)	
						Configuration Management Final Report (CMFR)	
4.4.3	4.3	Other: Other documentation may include the following: a) Software Development Plan; b) Standards and Procedures Manual; c) Software Project Management Plan; d) Software Maintenance Manual	SQAP	8 307 208 B	4.2	Software Development Plan (SDP)	
					4.3	Software Project Tracking File (SPTF)	
						Network Design Description (NDD)	
						Software Component Specification	
						Source Code	
					4.7	Quality Assurance Documents	
4.5	5	Standards, practices, conventions, and metrics	SQAP	8 307 208 B	5	Standards, practices, conventions, and metrics	

Table 3c. Mapping SPINLINE 3 Application SQAP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
4.5.1	5.1	Purpose: This section shall a) Identify the standards, practices, conventions, and metrics to be applied; b) State how compliance with these items is to be monitored and assured.	See 5.2 below				
	5.2	Content: The subjects covered shall include the basic technical, design, and programming activities involved, such as documentation, variable and module naming, programming, inspection, and testing	[PRO_Concept_Log_C]	8 303 350 K		Safety Software Design Process	Referenced in SQAP §6
			[PRO_Concept_Log_NC]	8 307 214 B		Non Safety Software Design Process	Referenced in SQAP §6
			[IL_Gest_Conf]	1 207 875 F		Software Guideline: Software Configuration Management Process	Referenced in SQAP §2 & 5
			[SDP]	8 307 211 B		SPINLINE 3 Software Development Plan - SDP	Referenced in SQAP §2, 4.2 & 5
			[IL_Spec_IHM]	1 208 592 B		Software Guideline: Human-Machine Interface specification process	Referenced in SQAP §2 & 5
			[IL_SCADE]	1 208 250 E		Software Guideline: SCADE Design Rules	Referenced in SQAP §2 & 5
			[IL_Prog_C]	1 208 954 C		Software Guideline: C programming rules: synthesis	Referenced in SQAP §2 & 5
			[IL_Prog_Def]	1 208 605 C		Defensive programming application rules	Not referenced but applicable
			[SVVP]	8 307 210 B		SPINLINE 3 Software Verification and Validation Plan - SVVP	Referenced in SQAP §2 & 7
			[SCMP]	8 307 209 B		SPINLINE 3 Software Configuration Management Plan - SCMP	Referenced in SQAP §2, 9 & 10
			[IL_GD_Intro]	1 207 853 E		Software Guideline : Documentation Guidelines	Referenced in SQAP §2 & 5
			[IL_Vérif_Doc]	1 207 947 D		Software Guideline: Software Document Evaluation Process	Referenced in SQAP §2 & 5
			[IL_Proc_Qual]	8 303 634 D		Software Guideline: Software Quality Assurance Process	Referenced in SQAP §2 & 5
			[IL_Ctrl_Log-Ext]	8 303 671 B		Software Guideline: Requirements for commercial software	Referenced in SQAP §2 & 5
			[IL_Outils]	1 206 747 E		Software Guideline: Requirements on tools used for software development	Referenced in SQAP §6

Table 3c. Mapping SPINLINE 3 Application SQAP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
4.6	6	Reviews and audits	SQAP	8 307 208 B	6	Reviews and audits	
4.6.1	6.1	Purpose: This section shall a) Define the technical and managerial reviews and audits to be conducted; b) State how the reviews and audits are to be accomplished; c) State what further actions are required and how they are to be implemented and verified.	Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P	8.2.2	Internal audits	Referenced in SQAP §2.
			SQAP	8 307 208 B	6	Reviews and audits	
4.6.2	6.2	Minimum requirements: a) Software Requirements Review (SRR) b) Preliminary Design Review (PDR) c) Critical Design Review (CDR) d) Software Verification and Validation Plan Review (SVVPR) e) Functional audit f) Physical audit g) In-process audits h) Managerial reviews i) Software Configuration Management Plan Review (SCMPR) j) Post-mortem review	SQAP	8 307 208 B	6	Management reviews	
						End of phase reviews	
						Document reviews	
						Audits	
						External audits	
			[PRO_Concept_Log_NC]	8 307 214 B		Non Safety Software Design Process	Referenced in SQAP §6
4.6.3	6.3	Other: Other reviews and audits may include the user documentation review (UDR). This review is held to evaluate the adequacy (e.g., completeness, clarity, correctness, and usability) of user documentation.	[PRO_Concept_Log_C]	8 303 350 K		Safety Software Design Process	Referenced in SQAP §6
			[IL_Proc_Qual]	8 303 634 D		Software Guideline: Software Quality Assurance Process	Referenced in SQAP §6
			[IL_Verif_Doc]	1 207 947 D		Software Guideline: Software Document Evaluation Process	Referenced in SQAP §6
4.7	7	Test: This section shall identify all the tests not included in the SVVP for the software covered by the SQAP and shall state the methods to be used	SQAP	8 307 208 B	7	Testing Activities	
			SVVP	8 307 210 B		SPINLINE 3 Software Verification and Validation Plan - SVVP	Referenced in SQAP §2, 7 & 8
			[IL_Plan_Test]	1 208 304 A		Software Guideline: Software Test Plan	Referenced in SQAP §2

Table 3c. Mapping SPINLINE 3 Application SQAP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
4.8	8	Problem reporting and corrective action: This section shall a) Describe the practices and procedures to be followed for reporting, tracking, and resolving problems identified in both software items and the software development and maintenance process; b) State the specific organizational responsibilities concerned with their implementation.	Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P	8.3	Control of nonconforming product	Referenced in SQAP §2.
			SQAP	8 307 208 B	8	Problem reporting and corrective action	
			SCMP	8 307 209 B	5.3	SPINLINE 3 Software Configuration Management Plan - SCMP	Referenced in SQAP §2, 8, 9 & 10
			SVVP	8 307 210 B	5.1, 6.1	SPINLINE 3 Software Verification and Validation Plan - SVVP	Referenced in SQAP §2, 7 & 8
4.9	9	Tools, techniques, and methodologies: This section shall identify the special software tools, techniques, and methodologies that support SQA, state their purposes, and describe their use	SQAP	8 307 208 B	9	Tools, techniques, and methodologies	
4.10	10	Code control: This section shall define the methods and facilities used to maintain, store, secure, and document controlled versions of the identified software during all phases of the software life cycle. This may be implemented in conjunction with a computer program library. This may be provided as a part of the SCMP. If so, an appropriate reference shall be made thereto	SCMP	8 307 210 B	4.5	SPINLINE 3 Software Verification and Validation Plan - SVVP	Referenced in SQAP §2, 8, 9 & 10
4.11	11	Media control: This section shall state the methods and facilities to be used to a) Identify the media for each computer product and the documentation required to store the media, including the copy and restore process; and b) Protect computer program physical media from unauthorized access or inadvertent damage or degradation during all phases of the software life cycle. This may be provided as a part of the SCMP. If so, an appropriate reference shall be made thereto.	SQAP	8 307 208 B	10	Media control	
			SCMP	8 307 209 B		SPINLINE 3 Software Configuration Management Plan - SCMP	Referenced in SQAP §2, 8, 9 & 10

Table 3c. Mapping SPINLINE 3 Application SQAP and Other Content to IEEE 730-1998 SQAP Content Guidance

IEEE 730-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 730 Section	SQAP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
4.12	12	Supplier control: This section shall state the provisions for assuring that software provided by suppliers meets established requirements. In addition, this section shall state the methods that will be used to assure that the software supplier receives adequate and complete requirements. For previously developed software, this section shall state the methods to be used to assure the suitability of the product for use with the software items covered by the SQAP. For software that is to be developed, the supplier shall be required to prepare and implement an SQAP in accordance with this standard. This section shall also state the methods to be employed to assure that the developers comply with the requirements of this standard.	Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P	7.4	Purchasing	Referenced in SQAP §2.
			SQAP	8 307 208 B	11	Supplier control	
4.13	13	Records collection, maintenance, and retention: This section shall identify the SQA documentation to be retained; shall state the methods and facilities to be used to assemble, safeguard, and maintain this documentation; and shall designate the retention period.	Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P	4.2	QMS Documents	Referenced in SQAP §2.
			SQAP	8 307 208 B	1.4	Creation and Update of the SQAP	
					12	Records collection, maintenance, and retention	
			SCMP	8 307 209 B	6.5	Archiving	Referenced in SQAP §12.
4.14	14	Training: This section shall identify the training activities necessary to meet the needs of the SQAP	Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P	6.2.2	Competence, awareness and training	Referenced in SQAP §2.
			SQAP	8 307 208 B	13	Training	
			[IL_Plan_Form_VV]	1 208 210 C		Software Guideline: Software V&V Team Training Plan	Referenced in SQAP §13.
4.15	15	Risk management: This section shall specify the methods and procedures employed to identify, assess, monitor, and control areas of risk arising during the portion of the software life cycle covered by the SQAP	Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P	4.2.4, 5.3, 7.0, 7.4.1, 7.5.5, 8.5.3	Embedded in quality management system processes. No separate section on risk management.	Referenced in SQAP §2.
			SQAP	8 307 208 B	14	Risk Management	
			[IL_Gest_Proj]	1 208 055 E		Software Guideline: Software Management Process	Referenced in SQAP §14.
No counterpart in IEEE 730			SQAP	8 307 208 B	1.2	Relationship of this SQAP to the Plans Defined in BTP 7-14	
					1.3	Definitions and Abbreviations	

Index of SPINLINE 3 Life Cycle Documents Listed in Table 3c				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
[IL_Outils]	1 206 747 D		Software Guideline: Requirements on tools used for software developmen	Referenced in SQAP §6
[IL_GD_Intro]	1 207 853 E		Software Guideline : Documentation Guidelines	Referenced in SQAP §2 & 5
[IL_GD_CCL]	1 207 854 B		Software Guideline: SRS Documentation Guideline	Referenced in SQAP §2
[IL_Gest_Conf]	1 207 875 F		Software Guideline: Software Configuration Management Process	Referenced in SQAP §2 & 5
[IL_Vérif_Doc]	1 207 947 D		Software Guideline: Software Document Evaluation Process	Referenced in SQAP §6
[IL_Gest_Proj]	1 208 055 E		Software Guideline: Software Management Process	Referenced in SQAP §14.
[IL_Plan_Form_VV]	1 208 210 C		Software Guideline: Software V&V Team Training Plan	Referenced in SQAP §13.
[IL_SCADÉ]	1 208 250 C		Software Guideline: SCADÉ Design Rules	Referenced in SQAP §2 & 5
[IL_Plan_Test]	1 208 304 A		Software Guideline: Software Test Plan	Referenced in SQAP §2
[IL_Spec_IHM]	1 208 591 B		Software Guideline: Human-Machine Interface specification process	Referenced in SQAP §2 & 5
[IL_Prog_Def]	1 208 605 C		Defensive programming application rules	Referenced in SQAP §2 & 5
[IL_Prog_C]	1 208 954 C		Software Guideline: C programming rules: synthesis	Referenced in SQAP §2 & 5
Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P		Rolls-Royce Civil Nuclear SAS Quality Manual	Referenced in SQAP §2.
[PRO_concept_Log_C]	8 303 350 K		Safety Software Design Process	Referenced in SQAP §14.
[IL_Proc_Qual]	8 303 634 D		Software Guideline: Software Quality Assurance Process	Referenced in SQAP §6
[IL_Ctrl_Log-Ext]	8 303 671 B		Software Guideline: Requirements for commercial software	Referenced in SQAP §2 & 5
[SQAP]	8 307 208 B		SPINLINE 3 Software Quality Assurance Plan - SQAP	
[SCMP]	8 307 209 B		SPINLINE 3 Software Configuration Management Plan - SCMP	Referenced in SQAP §12.
[SVVP]	8 307 210 B		SPINLINE 3 Software Verification and Validation Plan - SVVP	Referenced in SQAP §2 & 7
[SDP]	8 307 211 B		SPINLINE 3 Software Development Plan - SDP	Referenced in SQAP §2, 4.2 & 5
[PRO_Concept_log_NC]	8 307 214 B		Non Safety Software Design Process	Referenced in SQAP §6

Table 4a. Mapping *SPINLINE* 3 SQP MC3 and Other Content to IEEE 828-1998 SCMP Content Guidance

IEEE 828-1998 Guidance			Where found in <i>SPINLINE</i> 3 software life cycle documentation				
IEEE 828 Section	SCMP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.1	1	Introduction: Describes the Plan's purpose, scope of application, key terms, and references	SQP MC3	8 303 429 E	1	Purpose, Scope and Responsibilities	There is no separate SCMP. The SQP MC3 and subordinate guidance documents identified in this table perform the function of the SCMP.
			SDP MC3	1 207 102 A	1	Project Overview	
					2	Description of the Project	
			List of tools and libraries used by software	1 207 286			Referenced in SQP MC3 §9.2.2
4.2	2	SCM management: (Who?) Identifies the responsibilities and authorities for accomplishing the planned activities	SQP MC3	8 303 429 E	7.1	Purpose of Configuration Management (see SCM responsibilities below)	
4.2.1	2.1	Organization: The organizational context, both technical and managerial, within which the planned SCM activities are to be implemented shall be described.	SQP MC3	8 303 429 E	4	Specific organizational structure associated with the software project	
4.2.2	2.2	SCM responsibilities: The allocation of SCM activities to organizational units shall be specified.	SQP MC3	8 303 429 E	4.3	Duties of Members of the Software Team	
					7.4 & 8	Procedures for identification and entry into configuration; Management of changes to software and associated documentation	Software Project Manager is responsible for CM
4.2.3	2.3	Applicable policies, directives, and procedures: Any external constraints placed on the Plan by other policies, directives, and procedures shall be identified. For each, its impact and effect on the Plan shall be stated.	SQP MC3	8 303 429 E	2	Reference Documents and Applicable Documents	
			Guide to writing documentation	1 207 139	No		Referenced in SQP MC3 §6
			Document drafting rules	1 207 103	No		Referenced in SQP MC3 §9.3
4.3	3	SCM activities: (What?) Identifies all activities to be performed in applying to the project	SQP MC3	8 303 429 E	7	Configuration management	
					8	Management of changes to software and associated documentation	

Table 4a. Mapping *SPINLINE 3* SQP MC3 and Other Content to IEEE 828-1998 SCMP Content Guidance

IEEE 828-1998 Guidance			Where found in <i>SPINLINE 3</i> software life cycle documentation				
IEEE 828 Section	SCMP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.3.1	3.1	Configuration identification: The Plan shall identify the project configuration items (CI) and their structures at each project control point. The Plan shall state how each CI and its versions are to be uniquely named and describe the activities performed to define, track, store, and retrieve CIs.	SQP MC3	8 303 429 E	7.2	Configuration Elements	
					7.3	Identification of Elements	
					7.4	Procedure for Identification and Entry Into Configuration	
			List of documents for the CSS	1 207 269			These documents contain the results of configuration identification for the elements of the OSS.
			List of documents for the CD_LDU	1 207 282			
			List of documents for the BF	1 207 148			
			Software Configuration Management Report for the CSS	1 207 257			
			Software Configuration Management Report for the BF	1 207 277			
			Software Configuration Management Report for the CD_LDU	1 207 283			
4.3.2	3.2	Configuration control: Activities include request, evaluate, approve or disapprove, and implement changes to baselined CIs. Changes encompass both error correction and enhancement	SQP MC3	8 303 429 E	8	Management of changes to software and associated documentation	
			Document and data control	8 303 186	No		Referenced in SQP MC3 §6.3
			Upgrade management	8 303 197	No		Referenced in SQP MC3 §8
			Software maintenance and changes	1 206 624	No		Referenced in SQP MC3 §8
4.3.3	3.3	Configuration status accounting: Configuration status accounting activities record and report the status of project CIs	SQP MC3	8 303 429 E	10.3	Quality Monitoring Documentation	

Table 4a. Mapping *SPINLINE 3* SQP MC3 and Other Content to IEEE 828-1998 SCMP Content Guidance

IEEE 828-1998 Guidance			Where found in <i>SPINLINE 3</i> software life cycle documentation				
IEEE 828 Section	SCMP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.3.4	3.4	Configuration audits and reviews: Configuration audits determine to what extent the actual CI reflects the required physical and functional characteristics. Configuration reviews are management tools for establishing a baseline.	SQP MC3	8 303 429 E	10	Quality assurance measures	
					10.2.1	End-of-phase reviews	
					10.2.2	Document design reviews	
					10.2.3	Document peer reviews	
					10.2.4	Audits	
4.3.5	3.5	Interface control: Interface control activities coordinate changes to the project CIs with changes to interfacing items outside the scope of the Plan. Hardware, system software and support software, as well as other projects and deliverables, should be examined for potential interfacing effects on the project.	Interface Specifications - Operational System Software and Application Software	1 207 110 J			Not referenced in SMQP, but applicable.
			SQP MC3	8 303 429 E	4.3	Duties of members of the software team	Project Manager was responsible for coordination of work performed by the project partners
4.3.6	3.6	Subcontractor/vendor control: Subcontractor/vendor control activities incorporate items developed outside the project environment into the project CIs. Included are software developed by contract and software acquired in its finished form.	SES Department Quality Assurance Manual	8 303 186	7.4	Purchasing	Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]
4.4	4	SCM schedules: (When?) Identifies the required coordination of SCM activities with the other activities in the project	SDP MC3	1 207 102 A	3.4	Cost and schedule management	It is Rolls-Royce practice to put schedule details in the SDP for each project.
					6	Planning	
4.5	5	SCM resources: (How?) Identifies tools and physical and human resources required for execution of the Plan	SDP MC3	1 207 102 A	4	Resources to be deployed	It is Rolls-Royce practice to put resource details in the SDP for each project.
4.6	6	SCM plan maintenance: Identifies how the Plan will be kept current while in effect	SES Department Quality Assurance Manual	8 303 186		Document and Data Control	Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]
No counterpart in IEEE 828			None				

Index of SPINLINE 3 Life Cycle Documents Listed in Table 4a				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
Software maintenance and changes	1 206 624			Referenced in SQP MC3 §8
SDP MC3	1 207 102 A		Software Development Plan	
Document drafting rules	1 207 103			Referenced in SQP MC3 §9.3
Interface Specifications - Operational System Software and Application Software	1 207 110			
Guide to writing documentation	1 207 139			Referenced in SQP MC3 §6
List of documents for the BF	1 207 148			These documents contain the results of configuration identification for the elements of the OSS.
Software Configuration Management Report for the CSS	1 207 257			
List of documents for the CSS	1 207 269			
Software Configuration Management Report for the BF	1 207 277			
List of documents for the CD_LDU	1 207 282			
Software Configuration Management Report for the CD_LDU	1 207 283			
List of tools and libraries used by software	1 207 286			Referenced in SQP MC3 §9.2.2
SES Department Quality Assurance Manual	8 303 186			Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM], document 8 303 186 P
Upgrade management	8 303 197			Referenced in SQP MC3 §8
Design control	8 303 334			Referenced in SQP MC3 §9.3

Index of SPINLINE 3 Life Cycle Documents Listed in Table 4a				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
Software design control	8 303 350			Referenced in SQP MC3 §9.3
SQP MC3	8 303 429 E		Software Quality Plan (SQP) - MC3	Software Quality Plan (SQP) - MC3

Table 4b. Mapping *SPINLINE* 3 Platform Software SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance

IEEE 828-1998 Guidance			Where found in <i>SPINLINE</i> 3 software life cycle documentation				
IEEE 828 Section	SCMP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.1	1	Introduction: Describes the Plan's purpose, scope of application, key terms, and references	SCMP [PGCL_SPINLINE 3]	1 208 878 D	1	1.1 Purpose of document; 1.2 Scope; 1.3 Reference documents; 1.4 Glossary and abbreviations	This SCMP, document 1 208 878 D, is used in connection with modifications to the generic SPINLINE 3 platform software. Modifications may be made on occasion to improve this platform software. This SCMP applies only to the modification phase of the software life cycle. When a modification is needed, this SCMP provides the project-specific guidance for that modification effort. Modification of the platform software typically is not required for plant-
4.2	2	SCM management: (Who?) Identifies the responsibilities and authorities for accomplishing the planned activities	SCMP [PGCL_SPINLINE 3]	1 208 878 D	2.1	Duties and responsibilities	
			[IL_Gest_Conf]	1 207 875 F		Software Configuration Management Process	Referenced in SCMP §2.1 & 2.9
4.2.1	2.1	Organization: The organizational context, both technical and managerial, within which the planned SCM activities are to be implemented shall be described.	SMQP	1 208 686 B	4	Organization	
			Development environment organization	1 207 105			Referenced in SMQP §8.4
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	5	Organization	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
4.2.2	2.2	SCM responsibilities: The allocation of SCM activities to organizational units shall be specified.	SMQP	1 208 686 B	1.3	Responsibilities and changes to Quality Plan	
					4	Organization	
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	3.5	Configuration management activities and changes	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
			SCMP [PGCL_SPINLINE 3]	1 208 878 D	2.1	Duties and responsibilities	
			[IL_Gest_Conf]	1 207 875 F		Software Configuration Management Process	Referenced in SMQP §2.1 & 2.9

Table 4b. Mapping *SPINLINE* 3 Platform Software SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance

IEEE 828-1998 Guidance			Where found in <i>SPINLINE</i> 3 software life cycle documentation				
IEEE 828 Section	SCMP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.2.3	2.3	Applicable policies, directives, and procedures: Any external constraints placed on the Plan by other policies, directives, and procedures shall be identified. For each, its impact and effect on the Plan shall be stated.	SCMP [PGCL_SPINLINE 3]	1 208 878 D	1.3	Reference documents	
					3	Tools, Techniques, and Methodology	
					3.1	Principle applied to the organization of development spaces	Invokes process in [IT_SL3_Env_Dev]
			[IT_SL3_Env_Dev]	1 207 105 D		SPINLINE 3 technical instruction: Description of development environments	Referenced in SCMP §3.1
4.3	3	SCM activities: (What?) Identifies all activities to be performed in applying to the project	SCMP [PGCL_SPINLINE 3]	1 208 878 D	2.3	Elements managed and associated levels of control	
					3.2	Configuration administration	
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	3.5	Configuration management activities and changes	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
4.3.1	3.1	Configuration identification: The Plan shall identify the project configuration items (CI) and their structures at each project control point. The Plan shall state how each CI and its versions are to be uniquely named and describe the activities performed to define, track, store, and retrieve CIs.	SCMP [PGCL_SPINLINE 3]	1 208 878 D	2.2	Configuration breakdown	Refer to tree diagram of configuration breakdown
					2.5	Reference configuration	
					3.1	Configuration administration	
			List of documents for the CSS	1 207 269			These documents contain the results of configuration identification for the elements of the OSS.
			List of documents for the CD_LDU	1 207 282			
			List of documents for the BF	1 207 148			
			Software Configuration Management report for the CSS	1 207 257			
			Software Configuration Management report for the BF	1 207 277			
			Software Configuration Management report for the CD_LDU	1 207 283			

Table 4b. Mapping *SPINLINE 3* Platform Software SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance

IEEE 828-1998 Guidance			Where found in <i>SPINLINE 3</i> software life cycle documentation				
IEEE 828 Section	SCMP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.3.2	3.2	Configuration control: Activities include request, evaluate, approve or disapprove, and implement changes to baselined CIs. Changes encompass both error correction and enhancement	SMQP	1 208 686 B	7	Configuration Management	
			SCMP [PGCL_SPINLINE 3]	1 208 878 D	2.3	Elements managed and associated levels of control	
					2.4	Control levels	
					2.7	Managing modifications	
					2.9	Configuration control	Invokes process in [IL_Gest_Conf]
					3.3	Procedure for changing a SOURCE_1E type file	
					3.4	Work spaces under Unix for verification and unit tests	
					3.5	Initial migration and Control	
			[IL_Gest_Conf]	1 207 875 F	No	Software Configuration Management Process	Referenced in SCMP §2.1 & 2.9
4.3.3	3.3	Configuration status accounting: Configuration status accounting activities record and report the status of project CIs	SCMP [PGCL_SPINLINE 3]	1 208 878 D	2.8	Monitoring the configuration	
4.3.4	3.4	Configuration audits and reviews: Configuration audits determine to what extent the actual CI reflects the required physical and functional characteristics. Configuration reviews are management tools for establishing a baseline.	SMQP	1 208 686 B	11.1	Quality Actions: Typical Quality Assurance actions are: – Phase reviews, – Document control ⇒ document reviews, ⇒ peer reviews, – Regular monitoring of the Quality File.	
			SCMP [PGCL_SPINLINE 3]	1 208 878 D	2.6	Elements managed and associated levels of control	
4.3.5	3.5	Interface control: Interface control activities coordinate changes to the project CIs with changes to interfacing items outside the scope of the Plan. Hardware, system software and support software, as well as other projects and deliverables, should be examined for potential interfacing effects on the project.	Interface Specifications - Operational System Software and Application Software	1 207 110 J			Not referenced in SCMP, but applicable.

Table 4b. Mapping *SPINLINE* 3 Platform Software SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance

IEEE 828-1998 Guidance			Where found in <i>SPINLINE</i> 3 software life cycle documentation				
IEEE 828 Section	SCMP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
4.3.6	3.6	Subcontractor/vendor control: Subcontractor/vendor control activities incorporate items developed outside the project environment into the project CIs. Included are software developed by contract and software acquired in its finished form.	Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P	7.4	Purchasing	Not referenced in SCMP or SMQP, but applicable.
			SMQP	1 208 686 B	9	Monitoring Suppliers	
			[IL_Ctrl_log_Ext]	8 303 671 B		Software Instruction: External software reception control	Not referenced in SCMP, but applicable. Referenced in SMQP §9.2
4.4	4	SCM schedules: (When?) Identifies the required coordination of SCM activities with the other activities in the project	Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	6	Schedule	It is Rolls-Royce practice to put schedule details in the SDP for each project. Use of a separate SDP for each modification project is explained in SQMP §1.2.1
4.5	5	SCM resources: (How?) Identifies tools and physical and human resources required for execution of the Plan	Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	4	Means	It is Rolls-Royce practice to put resource details in the SDP for each project. Use of a separate SDP for each modification project is explained in SQMP §1.2.1
			[For_Gcf]			Configuration management tool training document	Referenced in SCMP §2.5, 2.6
4.6	6	SCM plan maintenance: Identifies how the Plan will be kept current while in effect	[Gest_Doc_Col_Ref]	8 303 638 B	No	Documents and reference files management	Not referenced in SCMP, but applicable. Referenced in SMQP §6 & 10
No counterpart in IEEE 828			SCMP	1 208 878 D	2.6	Archives	

Index of SPINLINE 3 Life Cycle Documents Listed in Table 4b				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
[IT_SL3_Env_Dev]	1 207 105 D		SPINLINE 3 Technical Instruction: Description of Development Environments	Referenced in SCMP §3.1
Interface Specifications - Operational System Software and Application Software	1 207 110 J			
List of documents for the BF Software Configuration Management Report for the CSS	1 207 148 1 207 257			These documents contain the results of configuration identification for the elements of the OSS.
List of documents for the CSS Software Configuration Management Report for the BF	1 207 269 1 207 277			
List of documents for the CD_LDU	1 207 282			
Software Configuration Management Report for the CD_LDU	1 207 283			
[IL_Gest_Conf]	1 207 875 F		Software Configuration Management Process	Referenced in SCMP §2.1 & 2.9
SDP 2000 Changes	1 208 645 A			Per SQMP §1.2.1, a specific Software Development Plan is created for each upgrade campaign
SMQP	1 208 686 B		Software Modification Quality Plan	
SCMP [PGCL_SPINLINE 3]	1 208 878 D		Software Configuration Management Plan for SPINLINE 3 Software Sub- assemblies Managed by CM Tool	
SDP 2001 Changes	1 208 908 A			Per SQMP §1.2.1, a specific Software Development Plan is created for each upgrade campaign
Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P			Not referenced in SCMP or SMQP, but applicable.
[Gest_Doc_Col_Ref]	8 303 638 B		Documents and reference files management	Not referenced in SCMP, but applicable. Referenced in SMQP §6 & 10

Index of SPINLINE 3 Life Cycle Documents Listed in Table 4b				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
[IL_Ctrl_log_Ext]	8 303 671 B		Software Instruction: External software reception control	Not referenced in SCMP, but applicable. Referenced in SMQP §9.2
[For_Gcf]			Configuration management tool training document	Referenced in SCMP §2.5, 2.6

Table 4c. Mapping *SPINLINE 3* Application SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance

IEEE 828-1998 Guidance			Where found in <i>SPINLINE 3</i> software life cycle documentation				
IEEE 828 Section	SCMP Section #	Content Guidance	Document*	Doc #	Section #	Document or Section Title	Notes
4.1	1	Introduction: Describes the Plan's purpose, scope of application, key terms, and references	SCMP	8 307 209 B	1.1	Purpose	Note that SCMP, document 8 307 209 B, is a generic template that establishes the framework for completing the SCMP for plant-specific application software that will interface with the <i>SPINLINE 3</i> generic platform software.
					2	Reference documents	
4.2	2	SCM management: (Who?) Identifies the responsibilities and authorities for accomplishing the planned activities	SCMP	8 307 209 B	3	Management Activities	Figure provides an integrated view of configuration management activities in each life cycle phase
					5.1	Management of SCM activity	
4.2.1	2.1	Organization: The organizational context, both technical and managerial, within which the planned SCM activities are to be implemented shall be described.	SCMP	8 307 209 B	3.1	Organization	
4.2.2	2.2	SCM responsibilities: The allocation of SCM activities to organizational units shall be specified.	SCMP	8 307 209 B	1.4	Creation and Update of the SCMP	
					3.2	Responsibilities	
					5.1	Management of SCM activity	Figure provides an integrated view of configuration management activities in each life cycle phase
4.2.3	2.3	Applicable policies, directives, and procedures: Any external constraints placed on the Plan by other policies, directives, and procedures shall be identified. For each, its impact and effect on the Plan shall be stated.	SCMP	8 307 209 B	2	Reference documents	
					3.3	Applicable policies, directives, and procedures:	
					6.4	Principles of development organization	
			[DSS_PEV]	8 303 197 K		RRCN Definition of the Change Management Process	Referenced in SCMP §3.3 & 5.3
			[PRO_Concept_log_NC]	8 307 214 B		Non Safety Software Design Process	Referenced in SCMP §3.3
			[PRO_Concept_Log_C]	8 303 350 K		Safety Software Design Process	Referenced in SCMP §3.3
			[IL_Gest_Conf]	1 207 875 F		Software Guideline: Software Configuration Management Process	Referenced in SCMP §3.3, 4.1, 5 & 6.
4.3	3	SCM activities: (What?) Identifies all activities to be performed in applying to the project	SCMP	8 307 209 B	4	SCM activities	Referenced in SCMP §6.2

Table 4c. Mapping *SPINLINE 3* Application SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance

IEEE 828-1998 Guidance			Where found in <i>SPINLINE 3</i> software life cycle documentation				
IEEE 828 Section	SCMP Section #	Content Guidance	Document*	Doc #	Section #	Document or Section Title	Notes
4.3.1	3.1	Configuration identification: The Plan shall identify the project configuration items (CI) and their structures at each project control point. The Plan shall state how each CI and its versions are to be uniquely named and describe the activities performed to define, track, store, and retrieve CIs.	SCMP	8 307 209 B	4.1	Configuration identification	
					5.2	Configuration identification	
			[IL_Gest_Conf]	1 207 875 F		Software Guideline: Software Configuration Management Process	Referenced in SCMP §3.3, 4.1, 5 & 6. Configuration Items are managed according to the three levels of control
			[Help_DIMENSIONS]	CD-DIMDOC-012		ChangeMan DIMENSIONS user guide	Referenced in SCMP §2, 4.1, 4.3, 6.5
			[CLARISSE_SUD]	8 002 800 C		CLARISSE SSDE user guide	Referenced in SCMP §4.1 & 6.
4.3.2	3.2	Configuration control: Activities include request, evaluate, approve or disapprove, and implement changes to baselined CIs. Changes encompass both error correction and enhancement	SCMP	8 307 209 B	4.2	Configuration control	
					5.3	Configuration control	
					6.3	Change management	
			[DSS_PEV]	8 303 197 K		RRCN Definition of the Change Management Process	Referenced in SCMP §3.3 & 5.3
			[IL_Gest_Conf]	1 207 875 F		Software Guideline: Software Configuration Management Process	Referenced in SCMP §3.3, 4.1, 5 & 6.
			[Help_DIMENSIONS]	CD-DIMDOC-012		ChangeMan DIMENSIONS user guide	Referenced in SCMP §3.3, 4.1, 5 & 6.
4.3.3	3.3	Configuration status accounting: Configuration status accounting activities record and report the status of project CIs	SCMP	8 307 209 B	4.3	Configuration status accounting	
					5.4	Configuration status accounting	
					6.3.4	Configuration Tracking	
			[Help_DIMENSIONS]	CD-DIMDOC-012		ChangeMan DIMENSIONS user guide	Referenced in SCMP §3.3, 4.1, 5 & 6.
4.3.4	3.4	Configuration audits and reviews: Configuration audits determine to what extent the actual CI reflects the required physical and functional characteristics. Configuration reviews are management tools for establishing a baseline.	SCMP	8 307 209 B	4.4	Configuration audits and reviews	
					5.1.2	Management Review of SCM	
					5.1.3	Configuration Audit Support	
					5.1.4	Configuration Review Support	

Table 4c. Mapping *SPINLINE 3* Application SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance

IEEE 828-1998 Guidance			Where found in <i>SPINLINE 3</i> software life cycle documentation				
IEEE 828 Section	SCMP Section #	Content Guidance	Document*	Doc #	Section #	Document or Section Title	Notes
4.3.5	3.5	Interface control: Interface control activities coordinate changes to the project CIs with changes to interfacing items outside the scope of the Plan. Hardware, system software and support software, as well as other projects and deliverables, should be examined for potential interfacing effects on the project.	SCMP	8 307 209 B	4.5	Interface control	
					5.5	Interface control	
			Interface Specifications	1 207 110 J		Interface Specifications - Operational System Software and Application Software	Not referenced in SCMP
4.3.6	3.6	Subcontractor/vendor control: Subcontractor/vendor control activities incorporate items developed outside the project environment into the project CIs. Included are software developed by contract and software acquired in its finished form.	Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P	7.4	Purchasing	Referenced in SCMP §2.
			SCMP	8 307 209 B	4.5.2	Interface Between RRCN and External Companies: Company_X	
					4.6	Subcontractor/Vendor Control	
					5.5.2	Interface Between RRCN and External Companies: Company_X	
					5.6	Subcontractor/Vendor Control	
			[X_RRCN_INT]				Referenced in SCMP §4.5.2 & 5.5.2. Defined specifically for each subcontractor and project
4.4	4	SCM schedules: (When?) Identifies the required coordination of SCM activities with the other activities in the project	SCMP	8 307 209 B	5	SCM schedules	
			SDP	8 307 211 B	6	Schedule	It is Rolls-Royce practice to put schedule details in the SDP for each project. SDP is referenced in §2 of the SCMP.
4.5	5	SCM resources: (How?) Identifies tools and physical and human resources required for execution of the Plan	SDP	8 307 211 B	9	Resource requirements	It is Rolls-Royce practice to put resource details in the SDP for each project. SDP is referenced in §2 of the SCMP.
			SCMP	8 307 209 B	6.1	SCM Tools	
			[Help_DIMENSIONS]	CD-DIMDOC-012		ChangeMan DIMENSIONS user guide	Referenced in SCMP §3.3, 4.1, 5 & 6.
			[CLARISSE_SUD]	8 002 800 C		CLARISSE SSDE user guide	Referenced in SCMP §4.1 & 6.
4.6	6	SCM plan maintenance: Identifies how the Plan will be kept current while in effect	SCMP	8 307 209 B	1.4	Creation and Update of the SCMP	
					7	SCM plan maintenance	

Table 4c. Mapping <i>SPINLINE 3</i> Application SCMP and Other Content to IEEE 828-1998 SCMP Content Guidance							
IEEE 828-1998 Guidance			Where found in <i>SPINLINE 3</i> software life cycle documentation				
IEEE 828 Section	SCMP Section #	Content Guidance	Document*	Doc #	Section #	Document or Section Title	Notes
No counterpart in IEEE 828			SCMP	8 307 209 B	1.2	Relationship of this SCMP to the Plans Defined in BTP 7-14	
					1.3	Definitions and Abbreviations	
					6.5	Archiving	

Index of SPINLINE 3 Life Cycle Documents Listed in Table 4c				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
[X_RRCN_INT]				Referenced in SCMP §4.5.2 & 5.5.2. Defined specifically for each subcontractor and project
[Reg_SLI]	1 204 971 G		Operating Rules of the Computer Center	Referenced in SCMP §6.2
Interface Specifications	1 207 110 J		Interface Specifications - Operational System Software and Application Software	
[IL_Gest_Conf]	1 207 875 F		Software Guideline: Software Configuration Management Process	Referenced in SCMP §3.3, 4.1, 5 & 6.
[CLARISSE_SUD]	8 002 800 C		CLARISSE SSDE user guide	Referenced in SCMP §4.1 & 6.
Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P		Rolls-Royce Civil Nuclear SAS Quality Manual	
[DSS_PEV]	8 303 197 K		RRCN Definition of the Change Management Process	Referenced in SCMP §3.3 & 5.3
[PRO_Concept_Log_C]	8 303 350 K		Safety Software Design Process	
[SQAP]	8 307 208 B		SPINLINE 3 Software Quality Assurance Plan - SQAP	
[SCMP]	8 307 209 B		SPINLINE 3 Software Configuration Management Plan - SCMP	
[SVVP]	8 307 210 B		SPINLINE 3 Software Verification and Validation Plan - SVVP	
[SDP]	8 307 211 B		SPINLINE 3 Software Development Plan - SDP	
[PRO_Concept_log_NC]	8 307 214 B		Non Safety Software Design Process	
[Help_DIMENSIONS]	CD-DIMDOC- 012		ChangeMan DIMENSIONS user guide	Referenced in SCMP §3.3, 4.1, 5 & 6.

Table 5a. Mapping <i>SPINLINE 3</i> SQP MC3 and Other Content to IEEE 1012-1998 SVVP Content Guidance							
IEEE 1012-1998 Guidance			Where found in <i>SPINLINE 3</i> generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
7.1	1	Purpose: The SVVP shall describe the purpose, goals, and scope of the software V&V effort, including waivers from this standard. The software project for which the Plan is being written and the specific software processes and products covered by the software V&V effort shall be identified.	SQP MC3	8 303 429 E	1	Purpose, scope and responsibilities	There is no separate SVVP. The SQP MC3 and the SVTP and subordinate guidance documents identified in this table perform the function of the SVVP.
			SDP MC3	1 207 102 A	1	Project Overview	
					2	Description of the Project	
			SVTP	1 207 146 G	1.1	Purpose	
7.2	2	Referenced documents: The SVVP shall identify the compliance documents, documents referenced by the SVVP, and any supporting documents supplementing or implementing the SVVP.	SQP MC3	8 303 429 E	2	Reference documents and applicable documents	SVTP is referenced in SQP MC3 §5.3, 6.2, 9.1 & 10.2.2.4
			SVTP	1 207 146 G	1.2	Reference documents and bibliography	
7.3	3	Definitions: The SVVP shall define or reference all terms used in the SVVP, including the criteria for classifying an anomaly as a critical anomaly. All abbreviations and notations used in the SVVP shall be described.	SQP MC3	8 303 429 E	3	Terminology, abbreviations and acronyms	SVTP is referenced in SQP MC3 §5.3, 6.2, 9.1 & 10.2.2.4
			SVTP	1 207 146 G	1.3	Reference documents and bibliography	
7.4	4	V&V overview: The SVVP shall describe the organization, schedule, software integrity level scheme, resources, responsibilities, tools, techniques, and methods necessary to perform the software V&V.	SQP MC3	8 303 429 E	5.1	Procedure used for software development	
7.4.1	4.1	Organization: The SVVP shall describe the organization of the V&V effort, including the degree of independence required (See Annex C of this standard). The SVVP shall describe the relationship of the V&V processes to other processes such as development, project management, quality assurance, and configuration management. The SVVP shall describe the lines of communication within the V&V effort, the authority for resolving issues raised by V&V tasks, and the authority for approving V&V products. Annex F provides an example organizational relationship chart.	SQP MC3	8 303 429 E	4	Specific organizational structure associated with the software project (project to create <i>SPINLINE 3</i>)	
			SDP MC3	1 207 102 A	5	Organization	

Table 5a. Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 1012-1998 SVVP Content Guidance							
IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
7.4.2	4.2	Master Schedule: The SVVP shall describe the project life cycle and milestones. It shall summarize the schedule of V&V tasks and task results as feedback to the development, organizational, and supporting processes (e.g., quality assurance and configuration management). V&V tasks shall be scheduled to be re-performed according to the task iteration policy. If the life cycle used in the SVVP differs from the life cycle model in this standard, this section shall describe how all requirements of the standard are satisfied (e.g., by cross-referencing to this standard).	SDP MC3	1 207 102 A	3.4	Cost and schedule management	
					6	Planning	
7.4.3	4.3	Software integrity level scheme: The SVVP shall describe the agreed upon software integrity level scheme established for the system and the mapping of the selected scheme to the model used in this standard. The SVVP shall document the assignment of software integrity levels to individual components (e.g., requirements, detailed functions, software modules, subsystems, or other software partitions), where there are differing software integrity levels assigned within the program. For each SVVP update, the assignment of software integrity levels shall be reassessed to reflect changes that may occur in the integrity levels as a result of architecture selection, detailed design choices, code construction usage, or other development activities.	SQP MC3	8 303 429 E	5.1	Procedures used for software development	The software to be produced belongs to one of three categories: - "standard" software - "safety class" software - HMI software
7.4.4	4.4	Resources summary: The SVVP shall summarize the V&V resources, including staffing, facilities, tools, finances, and special procedural requirements (e.g., security, access rights, and documentation control)	SDP MC3	1 207 102 A	4	Resources to be deployed	
			SVTP	1 207 146 G	3	Test resources	SVTP is referenced in SQP MC3 §5.3, 6.2, 9.1 & 10.2.2.4
7.4.5	4.5	Responsibilities: The SVVP shall identify an overview of the organizational element(s) and responsibilities for V&V tasks.	SQP MC3	8 303 429 E	4	Specific Organizational Structure Associated With Software Project	
			SDP MC3	1 207 102 A	5	Organization	

Table 5a. Mapping <i>SPINLINE</i> 3 SQP MC3 and Other Content to IEEE 1012-1998 SVVP Content Guidance							
IEEE 1012-1998 Guidance			Where found in <i>SPINLINE</i> 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
7.4.6	4.6	Tools, techniques, and methods: The SVVP shall describe documents, hardware and software V&V tools, techniques, methods, and operating and test environment to be used in the V&V process. Acquisition, training, support, and qualification information for each tool, technology, and method shall be included. Tools that insert code into the software shall be verified and validated to the same rigor as the highest software integrity level of the software. Tools that do not insert code shall be verified and validated to assure that they meet their operational requirements. If partitioning of tool functions can be demonstrated, only those functions that are used in the V&V processes shall be verified to demonstrate that they perform correctly for their intended use. The SVVP shall document the metrics to be used by V&V, and shall describe how these metrics support the V&V objectives.	SQP MC3	8 303 429 E	9	Methods, Tools and Rules	
			Rules for Verification/Validation of Software Components	1 207 107			Referenced in SQP MC3 §9.3
			SVTP	1 207 146 G	3	Rules, Methods, Tools	Refers to SQP MC3
					6	Regression tests	
7.5	5	V&V processes: The SVVP shall identify V&V activities and tasks to be performed for each of the V&V processes described in Clause 5 of this standard, and shall document those V&V activities and tasks. The SVVP shall contain an overview of the V&V activities and tasks for all software life cycle processes.	SQP MC3	8 303 429 E	5.1	Procedure used for software development	
					5.2	Development process for software incorporating HMLs	
					5.3	Description of phases	Identifies V&V tasks integrated into each phase
			Rules for Verification/Validation of Software Components	1 207 107			Referenced in SQP MC3 §9.3
			SVTP	1 207 146 G	2	Analysis of functions	SVTP is referenced in SQP MC3 §5.3, 6.2, 9.1 & 10.2.2.4
					4	Analysis of tests	
					5	Coverage of tests	
					7 to 10	Analysis of Tests on Upgrade	

Table 5a. Mapping <i>SPINLINE</i> 3 SQP MC3 and Other Content to IEEE 1012-1998 SVVP Content Guidance							
IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
7.5.1	5.1 - 5.6	Software life cycle: The SVVP shall include sections 5.1 through 5.6 for V&V activities and tasks in each life cycle phase	SQP MC3	8 303 429 E	5.3	Description of phases 1) Specification phase 2) Preliminary Design Phase 3) Detailed design phase 4) Production phase (coding and unit tests) 5) Integration phase 6) Validation phase 7) System tests	
		1) V&V Tasks	SVTP	1 207 146 G	2.4	Verification / validation sub-project	SVTP is referenced in SQP MC3 §5.3, 6.2, 9.1 & 10.2.2.4
		2) Methods and Procedures	SQP MC3	8 303 429 E	9	Methods, tools and rules	
			SVTP	1 207 146 G	3	Rules, Methods, Tools	Refers to SQP MC3
					6	Regression tests	
		3) Inputs	SQP MC3	8 303 429 E	5.3.1.1; 5.3.2.1; 5.3.3.1; 5.3.4.1; 5.3.5.1; 5.3.6.1	Phase inputs	
		4) Outputs	SQP MC3	8 303 429 E	5.3.1.2; 5.3.2.2; 5.3.3.2; 5.3.4.2; 5.3.5.2; 5.3.6.2	Phase outputs	
					5.3.1.3; 5.3.2.3; 5.3.3.3; 5.3.4.3; 5.3.5.3; 5.3.6.3	Conditions for completing phase	
					5) Schedule	SDP MC3	1 207 102 A
		6	Planning				
		6) Resources	SDP MC3	1 207 102 A	4	Resources to be deployed	It is Rolls-Royce practice to put resource details in the SDP for each project.
			SVTP	1 207 146 G	3	Test resources	SVTP is referenced in SQP MC3 §5.3, 6.2, 9.1 & 10.2.2.4
		7) Risks and Assumptions	SDP MC3	1 207 102 A	8	Risk assessment	
		8) Roles and Responsibilities	SQP MC3	8 303 429 E	4.3	Duties of members of the software team	
			SDP MC3	1 207 102 A	5	Organization	

Table 5a. Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 1012-1998 SVVP Content Guidance							
IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
7.6	6	V&V reporting requirements: V&V reporting shall consist of Task Reports, V&V Activity Summary Reports, Anomaly Reports, and the V&V Final Report.	SQP MC3	8 303 429 E	6.2	Documents specific to each software item embedded on a unit	Required V&V reports are (1) Software Validation Test Analysis (SVTP) and (2) Software Validation Test Reports (SVTR). See below for anomaly resolution and reporting.
					9.1.6	Software validation	
			SVTP	1 207 146 G			
			SVTR	1 207 232 F		Software Validation Test Report (SVTR) - Operational System Software for Safety Class Units. This constitutes the V&V Final Report	SVTR is referenced in SQP §8.2.6. SVTR may be updated in connection with the software modification.
			Rules for Verification/Validation of Software Components	1 207 107	No	Referenced in SQP MC3 §9.3	
7.7	7	V&V administrative requirements: Administrative V&V requirements shall describe anomaly resolution and reporting, task iteration policy, deviation policy, control procedures, and standards, practices, and conventions	See 7.1 - 7.5 below				
7.7.1	7.1	Anomaly resolution and reporting: The SVVP shall describe the method of reporting and resolving anomalies, including the criteria for reporting an anomaly, the anomaly report distribution list, and the authority and time lines for resolving anomalies. The section shall define the anomaly criticality levels. Classification for software anomalies may be found in IEEE Std 1044-1993.	SES Department Quality Assurance Manual	8 303 186	8.3	Control of nonconforming product	Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]
			SQP MC3	8 303 429 E	1.2.5	Procedure in the event of failure to apply the SQP	
			Rules for Verification/Validation of Software Components	1 207 107	No		Referenced in SQP MC3 §9.3
			Software Design Control	8 303 350			Referenced in SQP MC3 §9.3
			Development of Safety Class Software	1 206 076			Referenced in SQP MC3 §9.3
7.7.2	7.2	Task iteration policy: The SVVP shall describe the criteria used to determine the extent to which a V&V task shall be repeated when its input is changed or task procedure is changed. These criteria may include assessments of change, software integrity level, and effects on budget, schedule, and quality	SVTP	1 207 146 G	6	Regression tests	

Table 5a. Mapping <i>SPINLINE</i> 3 SQP MC3 and Other Content to IEEE 1012-1998 SVVP Content Guidance							
IEEE 1012-1998 Guidance			Where found in <i>SPINLINE</i> 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
7.7.3	7.3	Deviation policy: The SVVP shall describe the procedures and criteria used to deviate from the Plan. The information required for deviations shall include task identification, rationale, and effect on software quality. The SVVP shall identify the authorities responsible for approving deviations	SQP MC3	8 303 429 E	1.2.5	Procedure in the event of failure to apply the SQP	
7.7.4	7.4	Control procedures: The SVVP shall identify control procedures applied to the V&V effort. These procedures shall describe how software products and V&V results shall be configured, protected, and stored. These procedures may describe quality assurance, configuration management, data management, or other activities if they are not addressed by other efforts. The SVVP shall describe how the V&V effort shall comply with existing security provisions and how the validity of V&V results shall be protected from unauthorized alterations.	SES Department Quality Assurance Manual	8 303 186	4.2	QMS Documents	Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]
			SQP MC3	8 303 429 E	7	Configuration Management	
					8	Management of Changes to Software and Associated Documentation	
					10.3	Quality Monitoring Documentation	
					11	Reproduction, Protection, Delivery	
7.7.5	7.5	Standards, practices, and conventions: The SVVP shall identify the standards, practices, and conventions that govern the performance of V&V tasks including internal organizational standards, practices, and policies.	SQP MC3	8 303 429 E	5.1	Procedure used for software development	
					9	Methods, tools and rules	

Table 5a. Mapping SPINLINE 3 SQP MC3 and Other Content to IEEE 1012-1998 SVVP Content Guidance							
IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Document or Section Title	Notes
7.8	8	V&V documentation requirements: The SVVP shall define the purpose, format, and content of the test documents. A description of the format for these test documents may be found in IEEE Std 829-1983]. If the V&V effort uses test documentation or test types (e.g., component, integration, system, acceptance) different from those in this standard, the software V&V effort shall show a mapping of the proposed test documentation and execution to the test items defined in this standard. Test planning tasks defined in Table 1 shall be implemented in the test plan, test design(s), test case(s), and test procedure(s) documentation. The SVVP shall describe the purpose, format, and content for the V&V test documents: All V&V results and findings shall be documented in the V&V Final Report	SQP MC3	8 303 429 E	6.2	Documents specific to each software item embedded on a unit. Required V&V reports are (1) Software Validation Test Analysis (SVTP) and (2) Software Validation Test Reports (SVTR)	
					9.1.6	Software validation	
			SVTP	1 207 146 G			SVTP is referenced in SQP MC3 §5.3 6.2, 9.1 & 10.2.2.4 .
			SVTR	1 207 232 F			SVTR is referenced in SQP MC3 §5.3 6.2, 9.1 & 10.2.2.4
			V&V forms for the software components in configuration management.				These are V&V records produced in accordance with the Plans and instructions listed in this table.
No counterpart in IEEE 828			None				

Index of SPINLINE 3 Life Cycle Documents Listed in Table 5a				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
Development of Safety Class Software	1 206 076			Referenced in SQP MC3 §9.3
SDP MC3	1 207 102 A		Software Development Plan	
Rules for Verification/Validation of Software Components	1 207 107			Referenced in SQP MC3 §9.3
SVTP	1 207 146 G		Software Validation Test Plan (SVTP) - Operational System Software for Safety Class Units	
SVTR	1 207 232 F		Software Validation Test Report (SVTR) - Operational System Software for Safety Class Units	
SES Department Quality Assurance Manual	8 303 186			Referenced in SQP MC3 §2.1 & 6.3. Now known as Rolls-Royce Civil Nuclear SAS Quality Manual [PQM], document 8 303 186 P
Software Design Control	8 303 350			Referenced in SQP MC3 §9.3
SQP MC3	8 303 429 E		Software Quality Plan (SQP) - MC3	
V&V forms for the software components in configuration management.				These are V&V records produced in accordance with the Plans and instructions listed in this table.

Table 5b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Section Title or Reference Location	Notes
7.1	1	Purpose: The SVVP shall describe the purpose, goals, and scope of the software V&V effort, including waivers from this standard. The software project for which the Plan is being written and the specific software processes and products covered by the software V&V effort shall be identified.	SMQP	1 208 686 B	1.1 & 1.2	Purpose of Document; Scope of Application	There is no separate SVVP. The SMQP, SVTP and subordinate V&V guidance documents perform the function of the SVVP.
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	1.1	Origin and objectives of the project	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
					1.2	Contract Clauses	
			SVTP	1 207 146 G	1.1	Purpose	SVTP is referenced in SMQP §8.2.6. SVTP may be updated in connection with the software modification.
7.2	2	Referenced documents: The SVVP shall identify the compliance documents, documents referenced by the SVVP, and any supporting documents supplementing or implementing the SVVP.	SMQP	1 208 686 B	2	Applicable Documents and Reference Documents	
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	1.3	Technical reference documents	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
			SVTP	1 207 146 G	1.2	Reference documents and bibliography	SVTP is referenced in SMQP §8.2.6. SVTP may be updated in connection with the software modification.
7.3	3	Definitions: The SVVP shall define or reference all terms used in the SVVP, including the criteria for classifying an anomaly as a critical anomaly. All abbreviations and notations used in the SVVP shall be described.	SMQP	1 208 686 B	3	Terminology and Abbreviations	
			SVTP	1 207 146 G	1.3	Reference documents and bibliography	SVTP is referenced in SMQP §8.2.6. SVTP may be updated in connection with the software modification.

Table 5b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Section Title or Reference Location	Notes
7.4	4	V&V overview: The SVVP shall describe the organization, schedule, software integrity level scheme, resources, responsibilities, tools, techniques, and methods necessary to perform the software V&V.	SMQP	1 208 686 B	8.2.4	Unit tests of software components (includes Static Code Analysis & Functional Validation)	
					8.2.6	Software Validation	
					11.1.1	Phase reviews	
			Rules for Verification & Validation of software components	1 207 107			Referenced in SMQP §8.2 & 8.4
7.4.1	4.1	Organization: The SVVP shall describe the organization of the V&V effort, including the degree of independence required (See Annex C of this standard). The SVVP shall describe the relationship of the V&V processes to other processes such as development, project management, quality assurance, and configuration management. The SVVP shall describe the lines of communication within the V&V effort, the authority for resolving issues raised by V&V tasks, and the authority for approving V&V products. Annex F provides an example organizational relationship chart.	SMQP	1 208 686 B	4	Organization	
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	5	Organization	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
7.4.2	4.2	Master Schedule: The SVVP shall describe the project life cycle and milestones. It shall summarize the schedule of V&V tasks and task results as feedback to the development, organizational, and supporting processes (e.g., quality assurance and configuration management). V&V tasks shall be scheduled to be re-performed according to the task iteration policy. If the life cycle used in the SVVP differs from the life cycle model in this standard, this section shall describe how all requirements of the standard are satisfied (e.g., by cross-referencing to this standard).	Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	6	Schedule	It is Rolls-Royce practice to put schedule details in the SDP for each project. Use of a separate SDP for each modification project is explained in SQMP §1.2.1
					9.1	Planning	

Table 5b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Section Title or Reference Location	Notes
7.4.3	4.3	Software integrity level scheme: The SVVP shall describe the agreed upon software integrity level scheme established for the system and the mapping of the selected scheme to the model used in this standard. The SVVP shall document the assignment of software integrity levels to individual components (e.g., requirements, detailed functions, software modules, subsystems, or other software partitions), where there are differing software integrity levels assigned within the program. For each SVVP update, the assignment of software integrity levels shall be reassessed to reflect changes that may occur in the integrity levels as a result of architecture selection, detailed design choices, code construction usage, or other development activities.	SMQP	1 208 686 B	1.2.2	Software covered by the plan	
7.4.4	4.4	Resources summary: The SVVP shall summarize the V&V resources, including staffing, facilities, tools, finances, and special procedural requirements (e.g., security, access rights, and documentation control)	Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	4	Means	It is Rolls-Royce practice to put resource details in the SDP for each project. Use of a separate SDP for each modification project is explained in SQMP §1.2.1
			SVTP	1 207 146 G	3	Test resources	SVTP is referenced in SMQP §8.2.6. SVTP may be updated in connection with the software modification.
7.4.5	4.5	Responsibilities: The SVVP shall identify an overview of the organizational element(s) and responsibilities for V&V tasks.	SMQP	8 303 429 E	4	Organization	
			Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	5	Organization	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
			SVTP	1 207 146 G	2.4	Verification / validation sub-project	SVTP is referenced in SMQP §8.2.6. SVTP may be updated in connection with the software modification.

Table 5b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Section Title or Reference Location	Notes
7.4.6	4.6	Tools, techniques, and methods: The SVVP shall describe documents, hardware and software V&V tools, techniques, methods, and operating and test environment to be used in the V&V process. Acquisition, training, support, and qualification information for each tool, technology, and method shall be included. Tools that insert code into the software shall be verified and validated to the same rigor as the highest software integrity level of the software. Tools that do not insert code shall be verified and validated to assure that they meet their operational requirements. If partitioning of tool functions can be demonstrated, only those functions that are used in the V&V processes shall be verified to demonstrate that they perform correctly for their intended use. The SVVP shall document the metrics to be used by V&V, and shall describe how these metrics support the V&V objectives.	SMQP	1 208 686 B	8	Methods, Tools and Rules	
					8.2	Methods applied	
					8.3	Tools	
					8.4	Rules	
			[PRO_Concept_log_C]	8 303 350 K		Safety software design process	Referenced in SMQP §5.2 & 8.1
			[PRO_Concept_log_NC]	8 307 214 B		Non safety software design process	Referenced in SMQP §5.2 & 8.1
7.5	5	V&V processes: The SVVP shall identify V&V activities and tasks to be performed for each of the V&V processes described in Clause 5 of this standard, and shall document those V&V activities and tasks. The SVVP shall contain an overview of the V&V activities and tasks for all software life cycle processes.	SVTP	1 207 146 G	3	Rules, Methods, Tools (refers to SQP MC3)	SVTP is referenced in SMQP §8.2.6. SVTP may be updated in connection with the software modification.
					6	Regression tests	
			SMQP	1 208 686 B	5.2	SPINLINE 3 Software Modification Process	
					8.2.4	Unit tests of software components (includes Static Code Analysis & Functional Validation)	
					8.2.6	Software Validation	
					11.1.1	Phase reviews	
			Rules for Verification & Validation of software components	1 207 107			Referenced in SMQP §8.2 & 8.4
			SVTP	1 207 146 G	2	Analysis of functions	SVTP is referenced in SMQP §8.2.6. SVTP may be updated in connection with the software modification.
					4	Analysis of tests	
					5	Coverage of tests	
					7 to 10	Analysis of Tests on Upgrade	

Table 5b. Mapping *SPINLINE 3* SMQP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation						
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Section Title or Reference Location	Notes		
7.5.1	5.1 - 5.6	Software life cycle: The SVVP shall include sections 5.1 through 5.6 for V&V activities and tasks in each life cycle phase	SMQP	1 208 686 B	5.2	SPINLINE 3 Software Modification Process			
		1) V&V Tasks	Note: The focus of this Table is on the <u>maintenance phase</u> of the SPINLINE 3 software life cycle, which is addressed in §5.6 of IEEE 1012. Topics 1, 2, 3, 4 & 8 are already addressed elsewhere in this table. Refer to the SDP for Topics 5, 6 & 7.						
		2) Methods and Procedures							
		3) Inputs							
		4) Outputs							
		5) Schedule					It is Rolls-Royce practice to put schedule, resource, and risk details in the SDP for each project.		
		6) Resources							
		7) Risks and Assumptions							
8) Roles and Responsibilities									
7.6	6	V&V reporting requirements: V&V reporting shall consist of Task Reports, V&V Activity Summary Reports, Anomaly Reports, and the V&V Final Report.	SMQP	1 208 686 B	8.2.4	Unit tests of software components (includes Static Code Analysis & Functional Validation)			
					8.2.6	Software Validation			
					11.1.1	Phase reviews			
			SVTP	1 207 146 G		Software Validation Test Plan (SVTP) - Operational System Software for Safety Class Units	SVTP is referenced in SMQP §8.2.6. SVTP may be updated in connection with the software modification.		
					SVTR	1 207 232 F		Software Validation Test Report (SVTR) - Operational System Software for Safety Class Units. This constitutes the V&V Final Report	SVTR is referenced in SMQP §8.2.6. SVTR may be updated in connection with the software modification.
7.7	7	V&V administrative requirements: Administrative V&V requirements shall describe anomaly resolution and reporting, task iteration policy, deviation policy, control procedures, and standards, practices, and conventions	See below						

Table 5b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 1012-1998 SVVP Content Guidance							
IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Section Title or Reference Location	Notes
7.7.1	7.1	Anomaly resolution and reporting: The SVVP shall describe the method of reporting and resolving anomalies, including the criteria for reporting an anomaly, the anomaly report distribution list, and the authority and time lines for resolving anomalies. The section shall define the anomaly criticality levels. Classification for software anomalies may be found in IEEE Std 1044-1993.	Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P	8.3	Control of nonconforming product	Not referenced in SMQP, but applicable.
			[PRO_Concept_log_C]	8 303 350 K		Safety software design process	Referenced in SMQP §5.2 & 8.1
			[IL_Gest_Conf].	1 207 875 F		Software Configuration Management Process	Referenced in SMQP §7
7.7.2	7.2	Task iteration policy: The SVVP shall describe the criteria used to determine the extent to which a V&V task shall be repeated when its input is changed or task procedure is changed. These criteria may include assessments of change, software integrity level, and effects on budget, schedule, and quality	SVTP	1 207 146 G	6	Regression tests	SVTP is referenced in SMQP §8.2.6. SVTP may be updated in connection with the software modification.
7.7.3	7.3	Deviation policy: The SVVP shall describe the procedures and criteria used to deviate from the Plan. The information required for deviations shall include task identification, rationale, and effect on software quality. The SVVP shall identify the authorities responsible for approving deviations	[IL_Gest_Conf].	1 207 875 B		Software Configuration Management Process	Referenced in SMQP §7

Table 5b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Section Title or Reference Location	Notes
7.7.4	7.4	Control procedures: The SVVP shall identify control procedures applied to the V&V effort. These procedures shall describe how software products and V&V results shall be configured, protected, and stored. These procedures may describe quality assurance, configuration management, data management, or other activities if they are not addressed by other efforts. The SVVP shall describe how the V&V effort shall comply with existing security provisions and how the validity of V&V results shall be protected from unauthorized alterations.	Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P	4.2	QMS Documents	Not referenced in SMQP, but applicable.
			SMQP	1 208 686 B	7	Configuration Management	
					10	Reproduction, Protection, Delivery	
					11.3	Quality-related records	
			[IL_Ctrl_log_Ext]	8 303 671 B	No	Software Instruction: External software reception control	Referenced in SMQP §9.2
			[PGCL_SPINLINE 3]	1 208 878 D		SPINLINE 3 Software Configuration Management Plan	Referenced in SMQP §7. This SCMP may be updated in connection with the software modification. See SMQP §5.2.
			[IL_Gest_Conf].	1 207 875 F		Software Configuration Management Process	Referenced in SMQP §7
7.7.5	7.5	Standards, practices, and conventions: The SVVP shall identify the standards, practices, and conventions that govern the performance of V&V tasks including internal organizational standards, practices, and policies.	Modification-specific SDPs for 2000 & 2001 modification projects	1 208 645 A and 1 208 908 A	3.5	Configuration management activities and changes	Use of a separate SDP for each modification project is explained in SQMP §1.2.1
			Rules for Verification/Validation of Software Components	1 207 107			Referenced in SMQP §8.2 & 8.4

Table 5b. Mapping SPINLINE 3 SMQP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document (Shading means doc submitted to NRC)	Doc #	Section #	Section Title or Reference Location	Notes
7.8	8	V&V documentation requirements: The SVVP shall define the purpose, format, and content of the test documents. A description of the format for these test documents may be found in IEEE Std 829-1983]. If the V&V effort uses test documentation or test types (e.g., component, integration, system, acceptance) different from those in this standard, the software V&V effort shall show a mapping of the proposed test documentation and execution to the test items defined in this standard. Test planning tasks defined in Table 1 shall be implemented in the test plan, test design(s), test case(s), and test procedure(s) documentation. The SVVP shall describe the purpose, format, and content for the V&V test documents: All V&V results and findings shall be documented in the V&V Final Report	SMQP	1 208 686 B	8.2.4	Unit tests of software components (includes Static Code Analysis & Functional Validation)	
					8.2.6	Software Validation	
					11.1.1	Phase reviews	
			SVTP	1 207 146 G		Software Validation Test Plan (SVTP) - Operational System Software for Safety Class Units	SVTP is referenced in SMQP §8.2.6. SVTP may be updated in connection with the software modification.
			SVTR	1 207 232 F		Software Validation Test Report (SVTR) - Operational System Software for Safety Class Units. This constitutes the V&V Final Report	SVTR is referenced in SMQP §8.2.6. SVTR may be updated in connection with the software modification.
			SCMP [PGCL_SPINLINE 3]	1 208 878 D		SPINLINE 3 Software Configuration Management Plan	Referenced in SMQP §7. This SCMP may be updated in connection with the software modification. See SMQP §5.2.
No counterpart in IEEE 1012			None				

Index of SPINLINE 3 Life Cycle Documents Listed in Table 5b				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
Rules for Verification/Validation of Software Components	1 207 107			Referenced in SMQP §8.2 & 8.4
SVTP	1 207 146 G		Software Validation Test Plan (SVTP) - Operational System Software for Safety Class Units	
SVTR	1 207 232 F		Software Validation Test Report (SVTR) - Operational System Software for Safety Class Units	
[IL_Gest_Conf].	1 207 875 F		Software Configuration Management Process	Referenced in SMQP §7
SDP 2000 Changes	1 208 645 A			Software Development Plan. Per SQMP §1.2.1, a specific Software Development Plan is created for each upgrade campaign
SMQP	1 208 686 B		Software Modification Quality Plan	
SCMP [PGCL_SPINLINE 3]	1 208 878 D		SPINLINE 3 Software Configuration Management Plan	Referenced in SMQP §7. This SCMP may be updated in connection with the software modification. See SMQP §5.2.
SDP 2001 Changes	1 208 908 A			Per SQMP §1.2.1, a specific Software Development Plan is created for each upgrade campaign
Rolls-Royce Civil Nuclear SAS Quality Manual [PQM]	8 303 186 P			
[PRO_Concept_log_C]	8 303 350 K		Safety software design process	Referenced in SMQP §5.2 & 8.1
[IL_Ctrl_log_Ext]	8 303 671 B		Software Instruction: External software reception control	Referenced in SMQP §9.2
[PRO_Concept_log_NC]	8 307 214 B		Non safety software design process	Referenced in SMQP §5.2 & 8.1

Table 5c. Mapping SPINLINE 3 Application SVVP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
7.1	1	Purpose: The SVVP shall describe the purpose, goals, and scope of the software V&V effort, including waivers from this standard. The software project for which the Plan is being written and the specific software processes and products covered by the software V&V effort shall be identified.	SVVP	8 307 210 B	1.1	Purpose	Note that SVVP, document 8 307 210 B, is a generic template that establishes the framework for completing the SVVP for plant-specific application software that will interface with the SPINLINE 3 generic platform software.
7.2	2	Referenced documents: The SVVP shall identify the compliance documents, documents referenced by the SVVP, and any supporting documents supplementing or implementing the SVVP.	SVVP	8 307 210 B	2	Reference Documents	
7.3	3	Definitions: The SVVP shall define or reference all terms used in the SVVP, including the criteria for classifying an anomaly as a critical anomaly. All abbreviations and notations used in the SVVP shall be described.	SVVP	8 307 210 B	1.3	Definitions and Abbreviations	
7.4	4	V&V overview: The SVVP shall describe the organization, schedule, software integrity level scheme, resources, responsibilities, tools, techniques, and methods necessary to perform the software V&V.	SVVP	8 307 210 B	3	V&V Overview	
					Figures 3.2-1 & 3.2-1	V&V Activities in the Software Life Cycle for Safety Software; Software Life Cycle Process for Nonsafety Software	
7.4.1	4.1	Organization: The SVVP shall describe the organization of the V&V effort, including the degree of independence required (See Annex C of this standard). The SVVP shall describe the relationship of the V&V processes to other processes such as development, project management, quality assurance, and configuration management. The SVVP shall describe the lines of communication within the V&V effort, the authority for resolving issues raised by V&V tasks, and the authority for approving V&V products. Annex F provides an example organizational relationship chart.	SVVP	8 307 210 B	3.1	Organization	

Table 5c. Mapping *SPINLINE 3* Application SVVP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
7.4.2	4.2	Master Schedule: The SVVP shall describe the project life cycle and milestones. It shall summarize the schedule of V&V tasks and task results as feedback to the development, organizational, and supporting processes (e.g., quality assurance and configuration management). V&V tasks shall be scheduled to be re-performed according to the task iteration policy. If the life cycle used in the SVVP differs from the life cycle model in this standard, this section shall describe how all requirements of the standard are satisfied (e.g., by cross-referencing to this standard).	SVVP	8 307 210 B	3.2	Master Schedule	
			SDP	8 307 211 B	6	Schedule	It is Rolls-Royce practice to put schedule details in the SDP for each project. SDP is referenced in §2 of the SVVP.
7.4.3	4.3	Software integrity level scheme: The SVVP shall describe the agreed upon software integrity level scheme established for the system and the mapping of the selected scheme to the model used in this standard. The SVVP shall document the assignment of software integrity levels to individual components (e.g., requirements, detailed functions, software modules, subsystems, or other software partitions), where there are differing software integrity levels assigned within the program. For each SVVP update, the assignment of software integrity levels shall be reassessed to reflect changes that may occur in the integrity levels as a result of architecture selection, detailed design choices, code construction usage, or other development activities.	SVVP	8 307 210 B	3.3	Software Integrity Level Scheme	
7.4.4	4.4	Resources summary: The SVVP shall summarize the V&V resources, including staffing, facilities, tools, finances, and special procedural requirements (e.g., security, access rights, and documentation control)	SVVP	8 307 210 B	3.4	Resources Summary	
			SDP	8 307 211 B	9	Resource requirements	It is Rolls-Royce practice to put resource details in the SDP for each project. SDP is referenced in §2 of the SVVP.
			[IL_Plan_Form_VV]	1 208 210 C		Software Guideline: Software V&V Team Training Plan	Referenced in SVVP §3.4 & 4.2.2
7.4.5	4.5	Responsibilities: The SVVP shall identify an overview of the organizational element(s) and responsibilities for V&V tasks.	SVVP	8 307 210 B	1.4	Creation and Update of the SVVP	
					3.5	Responsibilities	

Table 5c. Mapping SPINLINE 3 Application SVVP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
7.4.6	4.6	Tools, techniques, and methods: The SVVP shall describe documents, hardware and software V&V tools, techniques, methods, and operating and test environment to be used in the V&V process. Acquisition, training, support, and qualification information for each tool, technology, and method shall be included. Tools that insert code into the software shall be verified and validated to the same rigor as the highest software integrity level of the software. Tools that do not insert code shall be verified and validated to assure that they meet their operational requirements. If partitioning of tool functions can be demonstrated, only those functions that are used in the V&V processes shall be verified to demonstrate that they perform correctly for their intended use. The SVVP shall document the metrics to be used by V&V, and shall describe how these metrics support the V&V objectives.	SVVP	8 307 210 B	3.6	Tools, techniques, and methods	
			[IL_Vérif_Doc]	1 207 947 D		Software Guideline: Software Document Evaluation Process	Referenced in SVVP §3.6, 4.3, 4.4 & 4.7
			[IL_Plan_Test]	1 208 304 A		Software Guideline: Software Test Plan	Referenced in SVVP §3.6, 4.3, 4.4, 4.5, 4.6 & 4.7
			[IL_GD_ATVL]	1 207 858 G		Software Guideline : Guide for writing a SVTP	Referenced in SVVP §3.6 & 4.3
			[IL_SCADE]	1 208 250 C		Software Guideline: SCADE Design Rules	Referenced in SVVP §3.6 & 4.4
			[VERIF_CMU]	3 002 593 A		User Manual for VERIF_CMU tool	Referenced in SVVP §3.6 & 4.4
			[VERIF_ASA]	3 002 594 A		User Manual for VERIF_ASA tool	Referenced in SVVP §3.6 & 4.4
			[VERIF_COMP]	3 003 769 A		User Manual for VERIF_COMP tool	Referenced in SVVP §3.6 & 4.4
			SCADE design evaluation checklists	8 307 250 B		Checklist for scade verification activities	Referenced in SVVP §3.6 & 4.4
			[IL_Prog_C]	1 208 954 C		Software Guideline: C programming rules: synthesis	Referenced in SVVP §3.6 & 4.5
			[IL_QAC]	8 307 104 A		Guideline : Source code static analysis process using QA-C	Referenced in SVVP §3.6.
			[IL_GD_RTVL]	1 207 859 A		Software Guideline : Guide for writing a SVTR	Referenced in SVVP §3.6 & 4.7
			[SP3_TST_BENCH]	3 002 494 C		User Manual for SPINLINE 3 Test bench tool	Referenced in SVVP §3.6.
			[IL_GD_TVL]	1 208 535 A		Software Guideline : Guide for writing a SVTPR	Referenced in SVVP §3.6 & 4.3

Table 5c. Mapping *SPINLINE 3* Application SVVP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
7.5	5	V&V processes: The SVVP shall identify V&V activities and tasks to be performed for each of the V&V processes described in Clause 5 of this standard, and shall document those V&V activities and tasks. The SVVP shall contain an overview of the V&V activities and tasks for all software life cycle processes.	SVVP	8 307 210 B	3.1.1	V&V Tasks According to Equipment Technology	
					3.1.2	V&V Tasks According to Software Category	
					Figures 3.2-1 & 3.2-1	V&V Activities in the Software Life Cycle for Safety Software; Software Life Cycle Process for Nonsafety Software	
					4	Life Cycle Verification and Validation Activity	
					4.1	Management of V&V Activity	
			[Pro_Concept_Log_NC]	8 307 214 B		Non Safety Software Design Process	Referenced in SVVP §4.1.4.
			[Pro_Concept_Log_C]	8 303 350 K		Safety Software Design Process	Referenced in SVVP §4.1.4.

Table 5c. Mapping SPINLINE 3 Application SVVP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
7.5.1	5.1 - 5.6	Software life cycle: The SVVP shall include sections 5.1 through 5.6 for V&V activities and tasks in each life cycle phase: 1) V&V Tasks 2) Methods and Procedures 3) Inputs 4) Outputs 5) Schedule 6) Resources 7) Risks and Assumptions 8) Roles and Responsibilities	SVVP	8 307 210 B	Figures 3.2-1 & 3.2-1	V&V Activities in the Software Life Cycle for Safety Software; Software Life Cycle Process for Nonsafety Software	
					4.2 to 4.11	• "Start of Software Project" Phase • Requirements Phase • Design Phase • Coding Phase • Test and Integration Phase • Validation Phase • "End of Software Project" Phase • Installation Phase • Operation Phase • Maintenance Phase	It is Rolls-Royce practice to put schedule, resource and risk analysis details in the SDP for each project.
			[IL_Plan_Form_VV]	1 208 210 C		Software Guideline: Software V&V Team Training Plan	Referenced in SVVP §3.4 & 4.2
			[IL_Vérif_Doc]	1 207 947 D		Software Guideline: Software Document Evaluation Process	Referenced in SVVP §3.6, 4.3, 4.4 & 4.7
			[IL_Plan_Test]	1 208 304 A		Software Guideline: Software Test Plan	Referenced in SVVP §3.6, 4.3, 4.4, 4.5, 4.6 & 4.7
			[IL_GD_TVL]	1 208 535 A		Software Guideline : Guide for writing a SVTPR	Referenced in SVVP §3.6 & 4.3
			[IL_GD_ATVL]	1 207 858 G		Software Guideline : Guide for writing a SVTP	Referenced in SVVP §3.6 & 4.3
			[IL_SCADE]	1 208 250 C		Software Guideline: SCADE Design Rules	Referenced in SVVP §3.6 & 4.4
			SCADE design evaluation checklists	8 307 250 B		Checklist for scade verification activities	Referenced in SVVP §3.6 & 4.4
			[VERIF_CMU]	3 002 593 A		User Manual for VERIF_CMU tool	Referenced in SVVP §3.6 & 4.4

Table 5c. Mapping SPINLINE 3 Application SVVP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
			[VERIF_ASA]	3 002 594 A		User Manual for VERIF_ASA tool	Referenced in SVVP §3.6 & 4.4
			[VERIF_COMP]	3 003 769 A		User Manual for VERIF_COMP tool	Referenced in SVVP §3.6 & 4.4
			[IL_Prog_C]	1 208 954 C		Software Guideline: C programming rules: synthesis	Referenced in SVVP §3.6 & 4.5
			[IL_GD_RTVL]	1 207 859 A		Software Guideline : Guide for writing a SVTR	Referenced in SVVP §3.6 & 4.7
			[PRO_Concept_log_NC]	8 307 214 B		Non Safety Software Design Process	Referenced in SVVP §4.1 & 4.8
			[PRO_Concept_log_C]	8 303 350 K		Safety Software Design Process	Referenced in SVVP §4.1 & 4.8
			Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P		Rolls-Royce Civil Nuclear SAS Quality Manual	Referenced in SVVP §2 & 4.9
			SCMP	8 307 209 B		Software Verification and Validation Plan	Referenced in SVVP §4.11
7.6	6	V&V reporting requirements: V&V reporting shall consist of Task Reports, V&V Activity Summary Reports, Anomaly Reports, and the V&V Final Report.	SVVP	8 307 210 B	5	V&V Reporting	
					5.1	Anomaly Reports	
					5.2	V&V Tasks Reports	
					5.3	V&V Phase Summary Reports	
					5.4	V&V Final Report	
7.7	7	V&V administrative requirements: Administrative V&V requirements shall describe anomaly resolution and reporting, task iteration policy, deviation policy, control procedures, and standards, practices, and conventions	SVVP	8 307 210 B	6	V&V Administrative Procedures	
7.7.1	7.1	Anomaly resolution and reporting: The SVVP shall describe the method of reporting and resolving anomalies, including the criteria for reporting an anomaly, the anomaly report distribution list, and the authority and time lines for resolving anomalies. The section shall define the anomaly criticality levels. Classification for software anomalies may be found in IEEE Std 1044-1993.	Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P	8.3	Control of nonconforming product	Referenced in SVVP §2 & 4.9
			SVVP	8 307 210 B	5.1	Anomaly Reports	
					6.1	Anomaly Reporting and Resolution	

Table 5c. Mapping SPINLINE 3 Application SVVP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
7.7.2	7.2	Task iteration policy: The SVVP shall describe the criteria used to determine the extent to which a V&V task shall be repeated when its input is changed or task procedure is changed. These criteria may include assessments of change, software integrity level, and effects on budget, schedule, and quality	SVVP	8 307 210 B	6.2	Task Iteration Policy	
7.7.3	7.3	Deviation policy: The SVVP shall describe the procedures and criteria used to deviate from the Plan. The information required for deviations shall include task identification, rationale, and effect on software quality. The SVVP shall identify the authorities responsible for approving deviations	SVVP	8 307 210 B	6.3	Deviation Policy	
7.7.4	7.4	Control procedures: The SVVP shall identify control procedures applied to the V&V effort. These procedures shall describe how software products and V&V results shall be configured, protected, and stored. These procedures may describe quality assurance, configuration management, data management, or other activities if they are not addressed by other efforts. The SVVP shall describe how the V&V effort shall comply with existing security provisions and how the validity of V&V results shall be protected from unauthorized alterations.	Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P	4.2	QMS Documents	Referenced in SVVP §2 & 4.9
			SVVP	8 307 210 B	6.4	Configuration Control Procedures	
			SCMP	8 307 209 B		SPINLINE 3 Software Configuration Management Plan - SCMP	Referenced in SVVP §6.4
7.7.5	7.5	Standards, practices, and conventions: The SVVP shall identify the standards, practices, and conventions that govern the performance of V&V tasks including internal organizational standards, practices, and policies.	SVVP	8 307 210 B	6.5	Standards, Practices, and Conventions	See SVVP §2

Table 5c. Mapping SPINLINE 3 Application SVVP and Other Content to IEEE 1012-1998 SVVP Content Guidance

IEEE 1012-1998 Guidance			Where found in SPINLINE 3 generic platform software life cycle documentation				
IEEE 1012 Section	SVVP Section #	Content Guidance	Document	Doc #	Section #	Document or Section Title	Notes
7.8	8	V&V documentation requirements: The SVVP shall define the purpose, format, and content of the test documents. A description of the format for these test documents may be found in IEEE Std 829-1983]. If the V&V effort uses test documentation or test types (e.g., component, integration, system, acceptance) different from those in this standard, the software V&V effort shall show a mapping of the proposed test documentation and execution to the test items defined in this standard. Test planning tasks defined in Table 1 shall be implemented in the test plan, test design(s), test case(s), and test procedure(s) documentation. The SVVP shall describe the purpose, format, and content for the V&V test documents: All V&V results and findings shall be documented in the V&V Final Report	SVVP	8 307 210 B	7	Documentation	
					7.1	Transverse V&V Documents	<ul style="list-style-type: none">• Software V&V Plan (SVVP)• Network Detailed Design (NDD) V&V report• V&V Final Report (VVFR)
					7.2	Software Product V&V Documents for Safety Software	<ul style="list-style-type: none">• Software Validation Test Plan (SVTP)• Software Validation Test Report (SVTR)• Verification reports• Anomaly reports
					7.3	Software Product V&V Documents for Nonsafety Software	<ul style="list-style-type: none">• Software Integration Test Plan and Report (SITPR)• Software Validation Test Plan and Report (SVTPR)• Verification reports• Anomaly reports
					No counterpart in IEEE 1012		
			3.7	Risk Management			

Index of SPINLINE 3 Life Cycle Documents Listed in Table 5c				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
[IL_GD_ATVL]	1 207 858 G		Software Guideline : Guide for writing a SVTP	Referenced in SVVP §3.6 & 4.3
[IL_GD_RTVL]	1 207 859 A		Software Guideline : Guide for writing a SVTR	Referenced in SVVP §3.6 & 4.7
[IL_Verif_Doc]	1 207 947 D		Software Guideline: Software Document Evaluation Process	Referenced in SVVP §3.6, 4.3, 4.4 & 4.7
[IL_Plan_Form_VV]	1 208 210 C		Software Guideline: Software V&V Team Training Plan	Referenced in SVVP §3.4 & 4.2
[IL_SCADE]	1 208 250 C		Software Guideline: SCADE Design Rules	Referenced in SVVP §3.6 & 4.4
[IL_Plan_Test]	1 208 304 A		Software Guideline: Software Test Plan	Referenced in SVVP §3.6 & 4.3
[IL_GD_TVL]	1 208 535 A		Software Guideline : Guide for writing a SVTPR	Referenced in SVVP §3.6 & 4.3
[SMQP]	1 208 686 B		Software Modification Quality Plan	Referenced in SVVP §4.11
[IL_Prog_C]	1 208 954 C		Software Guideline: C programming rules: synthesis	Referenced in SVVP §3.6 & 4.5
[SP3_TST_BENCH]	3 002 494 C		User Manual for SPINLINE 3 Test bench tool	Referenced in SVVP §3.6.
[VERIF_CMU]	3 002 593 A		User Manual for VERIF_CMU tool	Referenced in SVVP §3.6 & 4.4
[VERIF_ASA]	3 002 594 A		User Manual for VERIF_ASA tool	Referenced in SVVP §3.6 & 4.4
[VERIF_COMP]	3 003 769 A		User Manual for VERIF_COMP tool	Referenced in SVVP §3.6 & 4.4
Rolls-Royce Civil Nuclear SAS Quality Manual [PMQ]	8 303 186 P		Rolls-Royce Civil Nuclear SAS Quality Manual	Referenced in SVVP §2 & 4.9
[PRO_Concept_log_C]	8 303 350 K		Software Design Process	Referenced in SVVP §4.1 & 4.8
[IL_QAC]	8 307 104 A		Guideline : Source code static analysis process using QA-C	Referenced in SVVP §3.6.
[SQAP]	8 307 208 B		SPINLINE 3 Software Quality Assurance Plan - SQAP	

Index of SPINLINE 3 Life Cycle Documents Listed in Table 5c				
Document (Shading means doc submitted to NRC)	Doc #		Document or Section Title	Notes
[SCMP]	8 307 209 B		SPINLINE 3 Software Configuration Management Plan - SCMP	Referenced in SVVP §6.4
[SVVP]	8 307 210 B		SPINLINE 3 Software Verification and Validation Plan - SVVP	
[SDP]	8 307 211 B		SPINLINE 3 Software Development Plan - SDP	
[PRO_Concept_log_NC]	8 307 214 B		Non Safety Software Design Process	
SCADE design evaluation checklists	8 307 250 B		Checklist for scade verification activities	Referenced in SVVP §3.6 & 4.4