REQUEST FOR ADDITIONAL INFORMATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SPINLINE 3 DIGITAL SAFETY INSTRUMENTATION AND CONTROL PLATFORM

ROLLS-ROYCE

PROJECT NO. 773

The following request for additional information (RAI) questions address regulatory evaluation criteria for the Rolls-Royce SPINLINE 3 Platform Licensing Topical Report (LTR). The topics covered in this set of RAI questions include: follow-up items requesting clarification of earlier RAI responses, Rolls-Royce's configuration management program, and Rolls-Royce's independent verification and validation (V&V) program.

Items for Additional Clarification

By letter dated November 7, 2011, the U.S. Nuclear Regulatory Commission (NRC) staff transmitted a set of RAI questions to Rolls-Royce (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112900190). Rolls-Royce provided responses to these questions in a letter dated December 21, 2011 (ADAMS Accession No. ML12010A066). Based on the information provided, the NRC staff has the following follow-up questions.

RAI-31

Follow-up question for RAI-1 and RAI-3 -- RAI-1 and RAI-3 requested information about data communication from the input/output (I/O) boards to the UC25 N+ central processing unit (CPU) board and back.

The responses provided for these 2 RAI questions illustrate how the data is transferred through the backplane bus (BAP). Also, from the information provided, the NRC staff understands that the BAP is a Master/Slave parallel bus, controlled by the UC25 N+ CPU board, to address the I/O boards. This response states that the BAP uses a "Rolls-Royce proprietary secure protocol."

Further, the response to RAI-3 states: "The address of a given board, in a given position in the rack, is set during the design phase by a hardwired connection of specific pins on the backplane panel. This address is associated to the location of the board in the rack in its position. To read or write information to or from a given board, the operating system software (OSS) sets the relevant bits of the address bus. A board is then addressed when the bits on the address bus are equivalent to the address wired on the backplane panel."

Based on this information, the NRC staff reviewed additional documents submitted by Rolls-Royce, and found the following:

- Document No. 6 648 805 D describes the parallel bus interface and 68150 as follows: "When the microprocessor wants to access a board, it transmits the address of this board via the address bus and waits for an identifier to be returned. This identifier is part of the address corresponding to the position of the board in the addressable space. The TA signal (authorization to access the data bus) is then positioned by the peripheral component allowing the microprocessor to read the values transmitted by the addressed board on the data bus."

- Document No. 1 207 108 J explains that data acquired by the OSS is 'packed' or 'unpacked', so it can be used by the peripheral and/or application software.

Follow-up question**:** To support the NRC staff review, please provide the following;

a) A detailed description of data transmission through the BAP, including functions performed by the bus (describe how data is routed through the XF2 connector),

b) A description of how the communication between the CPU and I/O boards is performed through the XF1 connector,

c) A description and development of the proprietary secure protocol used in the BAP, and

d) A description of the 68150 component in the UC25 N+ CPU board.

RAI-32

Follow-up question for RAI-2 -- RAI-2 asked Rolls-Royce to identify SPINLINE 3 restrictions on hardware and physical architecture.

The RAI response provided does not clearly identify system restrictions or limitations. From the information provided, the NRC staff understood the following:

- The maximum number of transmitting stations in the NERVIA network is 20.
- A NERVIA+ daughter board can support one to three communication stations per unit.
- Only one UC25 N+ board can be installed in a backplane.
- One UC25 N+ CPU board is used per unit.
- One NERVIA+ daughter board can be mounted on the UC25 N+ CPU board to provide communication stations for the unit.

Based on this information, the NRC staff reviewed additional documents submitted by Rolls-Royce, and found the following:

- Document No. 1 207 108 J, Section 7.2, describes the maximum number of boards that can be run by the OSS.

As part of defining the scope of the LTR safety evaluation, the NRC staff needs to ensure that the limitations of the SPINLINE 3 Platform are well understood and stated to both avoid artificially constraining applications that may be submitted and minimizing the potential for applications to be submitted that significantly exceed staff's generic understanding of how SPINLINE 3 may be configured.

Follow-up question: To support the NRC staff review, please confirm if our understanding of the system constraint is correct. Then, describe in detail the hardware constraints of the SPINLINE 3 Platform (including number of communication stations and transceivers that the NERVIA+ daughter can support), and how this information relates to the information provided in Document No. 1 207 108 J, Section 7.2.

RAI-33

Follow-up question for RAI-5 -- Section 4.3 of the LTR states that the following components include electronic subcomponents, such as field programmable gate arrays (FPGAs), to process data. RAI-5 asked Rolls-Royce to provide detailed information on how these components were configured, how they operate, and how they will be dedicated for use in an Appendix B program.

The RAI response identifies descriptions provided in the LTR for FPGA and complex programmable logic device (CPLD) based components. Further, this response identifies development documents, as well as configuration management procedures used for the design and testing of these modules. The information provided in this response only referenced the procedure's names, so the NRC staff cannot evaluate how these procedures were established and used. Further, the NRC staff cannot evaluate the design and test program followed for these modules, and thus their robustness to be used in safety application.

Follow-up question: To support the NRC staff review, provide a detailed description on the design, testing, configuration management, communication with the BAP, operation, and dedication of these modules.

RAI-34

Follow-up question for RAI-5 -- Please describe the process Rolls-Royce follows to perform modifications of modules containing electronic subcomponents (e.g., FPGAs, CPLDs), that have been previously commercial grade dedicated.

RAI-35

Follow-up question for RAI-6 -- RAI-6 asked Rolls-Royce to describe the hardware development process followed for the SPINLINE 3 Platform. The response provided identified Procedure Nos. 8 303 314 L, "Project Execution Definition," and 8 303 334 F, "Project Development Process (System Design)," as the documents defining the design process used for SPINLINE 3. Copies of these procedures were provided in the attachments.

Follow-up question: After reviewing these procedures, the NRC staff has the following questions:

a) Section 4 of Procedure No. 8 303 314 identifies that for design engineering, Rolls-Royce would use the system design described in Procedure No. 8 303 334. However, it is not clear how these two procedures work together, since Procedure No. 8 303 334 describes the design process from the specification requirements until system acceptance by the client, which seems to overlap with the process described in Procedure No. 8 303 314. Please clarify how these documents are used and how they are cross referenced during the hardware development process.

b) Procedure No. 8 303 334 does not clarify what the design process would be used for existing modules that need to be updated or modified.

c) The response provided in the RAI states that "additional design process associated with firmware development is described in the response to RAI-5." As mentioned above, Rolls-Royce is asked to submit additional information for the NRC staff to evaluate the design process followed.

d) The response provided in the RAI identified that Procedure No. 8 307 032, "Principle for Control of Design (Safety System)," was submitted with the RAI response. However, this procedure was not included in the attachments of this RAI response. Please provide Procedure No. 8 307 032.

RAI-36

Follow-up question for RAI-7 -- LTR Section 4.3.4.4 states the accuracy and the response time of the ICTO board can be adjusted according to the needs. RAI-7 asked Rolls-Royce to explain how these can be adjusted and how these will be evaluated and decided for a plant-specific application.

The NRC staff reviewed the response provided for this answer, in particular the description provided in the third paragraph on how these parameters are defined and adjusted. Further, the NRC staff reviewed Document No. 1 479 513 C to understand how the ICTO board works. This document states: "The ICTO board and the associated I.ICTO interface board comprise two separate identical channels, each forming the interface between the acquisition system and the processing unit. Each channel has two operating modes which are handled automatically by the hardware."

Follow-up question: To support the NRC staff review, respond to the following requests.

a) Please describe in detail how the ICTO parameters are configured in the software embedded in the ICTO microcontroller.

b) Please explain, when the ICTO board is in operation, how these parameters are transferred from the ICTO channels to the acquisition system and the processing unit. This description should include how the data is exchanged through the 16 kB shared memory of the BAP.

RAI-37

Follow-up question for RAI-8 -- RAI-8 requested information about the Local Display Unit (LDU) and the Operator Panel. Specifically, the NRC staff is requesting clarification about units that can interface with the system. Section 4 of the LTR identifies the following units as those that can interface with the system:

- LDU
- Operator Panel
- Automated Testing Unit (ATU)
- Monitoring and Maintenance Unit (MMU)

Follow-up question: To support the NRC staff review, please respond to the following requests.

a) Please identify the interface unit that Rolls-Royce is asking the NRC to review and approve.

b) Please identify for each interface unit whether it is safety (1E) or non-safety related (non-1E).

c) The description provided about communication between UC25 N+ and LDU states this is an asynchronous link, only used during maintenance. Please provide additional information about this communication and how it meets the requirements of Interim Staff Guidance 4. Specifically the protocol used to communicate parameters changed to the SPINLINE 3 Operating System.

d) In the RAI response, Rolls-Royce explained that when the LDU is not connected, the interface function is idle. What measures does Rolls-Royce impose to restrict access to the front panel RJ45 connector when the LDU is not connected?

e) Regarding the Operator Panel, in the RAI response it seems that the information can be related to the information provided for the ATU in LTR Section 4.6.9 or to the MMU in LTR Section 4.6.10. Please clarify if the Operator Panel is the ATU and/or the MMU. If not, please clarify the description provided in the RAI and to what interface it belongs.

f) Please provide a clear description of the ATU and MMU. In particular, describe how the SPINLINE 3 platform communicates with these interfaces. Also, clarify if either interface will be qualified during the qualification of the SPINLINE 3 platform.

RAI-38

Follow-up question for RAI-14 -- RAI-14 asked Rolls-Royce to define the cycle time for the test specimen application program to be run in the Qualification Test Specimen.

The response provided information about the cycle time and CPU load for the Qualification test Specimen. Based on the information, the NRC staff reviewed information provided in the LTR, as well as other documents submitted to the NRC. Of particular interest is the information provided about the OSS in the LTR. In particular, LTR Section 4.4.3.1 explained that the OSS and the application software are the executable code in the system. Further, this code is executed sequentially, periodically and deterministically. The NRC staff understands that the cycle time for the SPINLINE 3 Platform would depend on the application for a plant-specific project.

Follow-up question: To support the NRC staff review, respond to the following requests.

a) Describe the relationship between CPU speed and code execution.

b) Since the OSS does not change for a plant-specific project, the OSS will have support for I/O modules not installed in the system. Please explain how these functions will affect the speed of the CPU and code execution to guarantee full use of the CPU.

c) LTR Sections 4.4.3.2 and 4.4.3.5.3 state that the cycle time management maintains the fixed cycle time, which is checked at each cycle. Document No. 1 207 110 J, "Interface Specifications," Section 3.2.1, describes the variables that the OSS uses to set the cycle time. However this document does not describe how this is done, only where this information is stored for the cycle time management. Then Section 3.4 of Document No. 1 207 110 J lists a variable to indicate if the cycle time is monitored or regulated. How is the pre-defined cycle time specified, monitored, and regulated?

d) Does the number of procedures and/or functions used by the application software change the size of the OSS code?

RAI-39

Follow-up question for RAI-28 -- RAI-28 requested clarification on how valid/invalid data will be treated and recorded by the data acquisition system (DAS) during environmental qualification testing.

The response provided in this question identified these possible treatments on data transferred in the NERVIA network:

- Nominal treatment
- Not nominal conditions and expected behaviors

According to the information provided in this response, during each cycle TSAP1 uses a signed 32 bit counter to transfer data to TSAP2 and DAS. A 32 signed bit counter is also used when data is being sent to TSAP1. Also, when data is exchanged from TSAP1 and TSAP2, a global validity indicator is used to indicate if the data is valid or not. Then the response explains how data is treated during not nominal conditions and expected behaviors. This section does not explain when such treatment is used or even what triggers such treatment. Further this section uses terms (e.g., TSAP1 counter) that are not clearly related to the previous validity management scheme. Because of the unclear information provided, the NRC staff reviewed additional documents to understand how data will be treated and transferred on the NERVIA networks.

LTR Section 4.5.2 indicates that invalid or corrupt data are processed by receiving stations until a valid message is received. LTR Section 4.5.4.2 states that erroneous data is flagged as invalid and handled in accordance with the engineering fault management, which is built into the application software. Then Section 4.5.5.2 states that if there is an error the data is invalidated by the receiving unit OSS, and the application software processes the data as invalid.

LTR Section 4.5.6 states: "The refreshment indicator is incremented by the emitting Unit each time it transmits the CB [consistency block]. The receiving Unit checks that the refreshment indicator has been updated. This ensures that the information available in the CB has been refreshed by the emitting unit since its last processing by the receiving unit."

Document No. 1 207 108 J, "OSS Software Requirement Specification," Section 4.2, describes the 'validite_associe' flag used to identify valid/invalid data transferred on the NERVIA network. So when data is invalid, this flag is set to invalid. Then LTR Section 5.8.48 states that a validity indicator needs to be associated with each CB.

Thus it is not clear if the referenced documents are referring to the same validity management scheme described in your response, or whether the terms used are related.

Follow up question: To support the NRC staff review, respond to the following requests.

a) Explain what "not nominal conditions and expected behaviors" are and when and how they occur.

b) Provide detailed explanation on how data will be treated and transferred on the NERVIA network, using the terminology provided in the LTR and other Rolls-Royce documents, and cross reference with the treatments described in the RAI response, since a clear connection could not be made. For example, it is not clear if the global indicator described in the RAI response is the same validity indicator described in Document No. 1 207 108 J (i.e., 'validite_associe' flag).

c) Describe the variables associated with data transmission and validity that are described in the LTR and Document No. 1 207 108 J.

RAIs regarding Rolls-Royce SPINLINE 3 Configuration Management

The following questions relate to the Rolls-Royce Software Configuration Management Plan (SCMP).

RAI-40

SCMP Section 2.7.1, "Archival of the environment managed by the configuration management tool," reads: "An archive baseline contains every version of every managed element regardless of its state. The archival method is described in [Train_CMtool]. The archive baseline is archived according to the rules set out in [Rules_IT]."

a) Please explain what it's meant by the term "state". Also, clarify if this term is related to whether an element has been "checked out" or "checked in."

b) Please state if you have submitted documents [Train_CMtool] and [Rules_IT] for NRC staff review. If you have submitted them, please provide the date of the letter.

RAI-41

SCMP Section 2.5, "The various levels of checks," reads: "All the intermediate states of items are managed in configuration, whatever their life cycle."

This sentence is unclear and does not describe the checks performed at different levels. Please provide a better description of what is meant by this statement.

RAI-42

The terms "classified software," "safety classified software," "standard software," and "not classified" are used in Sections 2.6.2 and 2.4 of the SCMP. Please explain what is meant by these terms.

RAI-43

SCMP Section 2.8, “Change Management,” reads: “Change management is carried out in accordance with the standard procedures outside of the CM [configuration management] tool and is not affected by the implementation of the CM tool. Only traceability elements are added to the CM tool so as to ensure links with these standard procedures.”

Please explain what these “standard procedures” are and what document contains them. If the document that contains these standard procedures has been submitted for staff review, please provide the date of the letter.

The following questions relate to the Rolls-Royce CM tool.

RAI-44

Please state if the CM tool is running on one computer, or on a server. If the CM tool is running on a server, please explain what the process is for using the tool from multiple computers simultaneously.

RAI-45

Please give details regarding what the operating system is for the computer(s) that runs the CM tool (e.g., Windows, Linux, UNIX).

RAI-46

Please explain if the Work Area used to modify items is located on a local or shared drive.

RAI-47

Please state if the computer(s) that runs the CM tool is/are connected to the internet. If they are not intended to be connected to the internet, please explain what measures are taken to prevent a connection, if any.

RAI-48

Please explain who has authorization to access the CM tool and how the CM tool is protected from unauthorized access.

RAI-49

Please explain how the change control process prevents unauthorized changes to the software.

RAI-50

Please explain if streams or projects are used when managing files with the CM tool. Please explain if there is a Rolls-Royce document that provides instructions as to what method to use to manage files.

RAI-51

Please explain if files developed and controlled with the CM tool can be modified in parallel (i.e., two or more people can check the same file out and work on it separately). If so, please explain what controls the CM tool uses to manage the file check in process.

RAI-52

Please explain how the 'Request' feature of the CM tool is used to authorize and control changes.

RAI-53

Please explain what type of 'Client' is used to run the CM tool (i.e., Desktop, Web, Windows Explorer Integration, or Command Line).

The following questions relate to the Rolls-Royce CM Process [SI_Conf_Mngt].

RAI-54

The CM Process [SI_Conf_Mngt] lists GEVOL and ORIENT as system change and non-conformity management tools used throughout the company, whereas Dimensions CM is the change management tool specific for the software group.

a) Please state if there is a situation or event in the software development and/or CM processes that requires the use of GEVOL or ORIENT. Please explain if in such an event, the same change is also tracked independently with the Dimensions CM tool.

b) Please explain if and how the GEVOL and ORIENT tools interact or exchange information with the Dimensions CM tool.

c) Please state if the Dimensions CM tool shares the same work area as GEVOL and ORIENT.

d) Please state if any of the files controlled by the Dimensions CM tool is also controlled by GEVOL or ORIENT.

RAI-55

The CM Process [SI_Conf_Mngt], Section 7.3.1, "Record", reads: "Records are recorded in: … in Dimensions CM in accordance with the procedure indicated in [SI_GD_NC]."

Please explain if [SI_GD_NC] has been submitted for NRC staff review. If it has been submitted for NRC staff review, please provide the date of the letter.

RAI-56

Please explain how the List of Tools and Libraries used for Software Development and List of Software Documents are used with the CM tool for tracking purposes (i.e., are these lists accessed/edited from the CM tool?).

RAI-57

Please provide a description of your corrective action program and how it is applied in the CM and software development processes.

RAI-58

Please explain if any documents controlled in CM are maintained in hard copy. If so, please explain how access to these documents is controlled and how is the change management process applied to them.

RAIs regarding Rolls-Royce SPINLINE 3 Independent Verification and Validation

Section 3.3.12 of the Rolls-Royce SPINLINE 3 Platform LTR does not make an explicit commitment to comply with Regulatory Guide (RG) 1.168 or Institute of Electrical and Electronic Engineers (IEEE) Standard (Std.) 1012-1998 for future development or enhancements to the SPINLINE 3 Platform. As an alternate approach, Rolls-Royce states that the SPINLINE 3 V&V process was established in accordance with International Electrotechnical Commission 880-1986. In order for the NRC staff to establish that Rolls-Royce's approach provides for V&V equivalent to NRC regulatory positions and endorsed standards, the following additional information is requested.

RAI-59

RG 1.168, Section C.1, states "Software used in nuclear power plant safety systems should be assigned integrity level 4 or equivalent, as demonstrated by a mapping between the applicant or licensee approach and integrity level 4 as defined in IEEE Std. 1012-1998." The NRC staff does note that Rolls-Royce's V&V approach is described throughout a number of documents, rather than a single document. The LTR provides a mapping between the provisions in Section 7 of IEEE Std. 1012-1998 and Rolls-Royce documentation. However, the mapping does not go to the level of detail of identifying how Rolls-Royce activities map to the software integrity level 4 activities identified in the IEEE Standard. In order to facilitate the NRC staff making a finding of equivalency between Rolls-Royce's existing procedures for future work on the SPINLINE 3 Platform and NRC endorsed methods for V&V of safety related software systems, additional information is requested.

Per the RG quotation above, please provide a mapping of the specific Rolls-Royce V&V activities that Rolls-Royce considers being the equivalent of the software integrity level 4 tasks identified in IEEE Std. 1012-1998. Please use the information provided in Tables 1 through 3 of the IEEE Std. for this mapping. In particular, Table 2 of IEEE Std. 1012-1998 identifies tasks appropriate for integrity level 4 systems. Table 1 of IEEE Std. 1012-1998 provides an elaboration of those tasks along with inputs and outputs to each task. In addition, Section C.7 of RG 1.168 states that Table 3 of IEEE Std. 1012-1998 contains additional tasks appropriate for software integrity level 4 systems.

Should there be tasks or activities in IEEE Std. 1012-1998 or RG 1.168 for which there is no equivalent Rolls-Royce activity, please provide Rolls-Royce rationale for not having provisions to perform those tasks for future development on the Rolls-Royce SPINLINE 3 Platform.

In order to reach a conclusion regarding appropriate independence of V&V activities (RG 1.168, Section C.3), the NRC staff requests that Rolls-Royce provide the following supplemental information regarding Procedure No. 8 303 350 L, "Quality Procedure – Control of Software Design (safety systems).

RAI-60

In Section 3.2 of Procedure No. 8 303 350 L, a special staffing case is noted for V&V staffing for Class B or C2 software.

a) Please define Class B and Class C2 software.

b) If Class B and C2 software would be used for safety class systems in U.S. plants:

- Please explain why a staffing exception is taken for these "safety class" software developments.

- Please explain why it is acceptable for members of the development team, who still report to the software project manager, to perform V&V and still maintain independence to perform their V&V role.

RAI-61

In Section 6.2.1 of Procedure No. 8 303 350 L, the typical project organization chart depicts the Software V&V Manager reporting to the Project Manager (PM) who is in charge of both hardware and software. Per Section 6.2.2, the PM has responsibilities related to cost and schedule for the overall project.

Please clarify how Rolls-Royce's internal processes and procedures provide the appropriate authority and organizational freedom to perform the V&V activities, when combined with the organizational structure presented in Section 6.2.1, to be consistent with accepted NRC staff regulatory positions and standards on independence of V&V.

RAI-62

Section 6.2.11 of Procedure No. 8 303 350 L states that in the event of disagreement between the development team and the V&V team, the Software Group Manager's decision shall be binding. The section also notes that a mediation process is available via the Software Quality Assurance Manager, with potential escalation of issues to the Engineering Department Manager and the Quality & Infrastructure Department Manager.

Please clarify the organizational relationship between the Software Group Manager, Software Quality Assurance Manager, Engineering Department Manager, and the Quality & Infrastructure Department Manager. Specifically, please explain how they sit in the overall organizational chart.

Additional questions related to Rolls-Royce V&V.

RAI-63

RG 1.168, Section C.6, discusses the use of tools. [In addition, IEEE Std. 7-4.3.2 – 2003, Section 5.3.2, which is endorsed by RG 1.152, Revision 3, also discusses the use of tools.] The NRC staff did note the Rolls-Royce discussion of the tools used to support the Rolls-Royce V&V processes in the docketed materials. For example:

- Document No. 1 208 686 B references use of VERIF_COMP
- Document No. 1 207 107 D references use of VERIF_COMP_UNIX

Please clarify how the tools referenced above are used to support V&V activities. [Specifically, the NRC staff is looking to ensure that the tools are not used in lieu of personnel to confirm system characteristics and performance.]

RAI-64

RG 1.168, Section C.3, quotes the following from Title 10 of the *Code of Federal Regulations* Part 50, Appendix B: "the program must provide for indoctrination and training of personnel performing activities affecting quality as necessary to ensure that suitable proficiency is achieved and maintained." The NRC staff noted descriptions of the organization(s) involved in docketed Rolls-Royce materials; however, the NRC staff did not identify any specific descriptions regarding how V&V personnel were selected and/or trained.

Please provide information to demonstrate that V&V personnel are sufficiently proficient in software engineering.

RAI-65

Document No. 1 208 686 B, "Software Modification Quality Plan," Section 8.2.5, describes the 'software integration tests' for software modification. Document No. 8 303 350 L, "Project Execution Process: Software," Section 8.5, which also describes integration, notes that the tests performed are not recorded. Please clarify how the V&V organization and/or Rolls-Royce V&V processes are used during integration testing and how test documentation is recorded and maintained.

RAI-66

Document No. 8 303 350 L, "Project Execution Process: Software," Section 8.4, notes that 'manual coding' is verified and subject to unit tests by the V&V team. Please explain how automatic code generation is treated under the Rolls-Royce V&V processes. [Section 4.4.4.1 of the LTR addresses the use of CLARISSE in automatic code generation.]

RAI-67

Follow-up question for RAI-11(b) -- In the Rolls-Royce response to RAI-11(b) regarding commercial grade dedication, the statement is made: "Rolls-Royce concluded that the SPINLINE 3 software and firmware development processes (including the original validation testing) were of acceptable [sic] based on the rigor of the development processes, quality of the

development documentation, and the validity of the results obtained. The software validation tests were accepted by Method 2 and are described in LTR Sections 6.2 and 6.3."

As was noted at the start of the V&V section of questions (i.e., RAI-59 – RAI-67), the NRC staff understands that SPINLINE 3 was not developed under a program specifically tailored to IEEE Std. 1012. However, in order to substantiate that the software V&V processes were of sufficient rigor for purposes of commercial grade dedication – when taken in context with other activities performed and credited under Method 1 and Method 4 per Electric Power Research Institute 106439 – please provide a mapping of the original V&V activities (associated with the "original validation testing" noted above) to the software integrity level 4 tasks identified in IEEE Std. 1012-1998. [Note: this request is similar to RAI-59, but is focused on the original V&V processes used in SPINLINE 3 development, rather than the current processes that would be used for future platform development.]