

**Attachment B**  
**Safety Software Quality Assurance FAQs Competencies Satisfied by the**  
**American Society for Quality (ASQ) Software Quality Engineer Course**

<b>Safety Software Quality Assurance FAQs DOE-STD-1172-2003 Competency Requirement</b>	<b>Met</b>	<b>Partially Met</b>	<b>Not Met</b>	<b>American Society for Quality (ASQ) Software Quality Engineering Course</b>
<b>Competency 1.</b> Shall demonstrate a working level knowledge of the types of safety system software and safety design and analysis software, including custom software and commercial off-the-shelf software (COTS). This includes instrumentation and control software and firmware (e.g., human-machine interface software, and programmable logic controller software), and computer calculation and database program software used in the design and accident analysis of nuclear facilities.			<b>v</b>	This competency is not met. The risk management portion of the course covers some of the general concepts and characteristics of safety software however there is no DOE nuclear facility specific safety related information. Most DOE safety software quality assurance personnel are familiar with types of safety software and safety design and analysis software.
<b>Competency 2.</b> Shall demonstrate a working level knowledge of the functional interfaces between safety system software components and the system-level design.	<b>v</b>			This competency is met by the ASQ Software Quality Engineering Course
<b>Competency 3.</b> Shall demonstrate a working level knowledge of the relationships between the problems being addressed by safety analysis and design codes, the design requirements for the codes, and the components of the codes.		<b>v</b>		This competency is partially met. The course identifies how features are translated to software functional requirements. How those functional requirements are solicited, defined, documented, controlled and traced through the software life cycle. It does not specifically address safety software applications. Course attendee interaction should supplement the course material.
<b>Competency 4.</b> Shall demonstrate a working level knowledge of the safety software life cycle processes described in IEEE 1074, <i>IEEE Standard for Developing Software Life Cycle Processes</i> .	<b>v</b>			This competency is met by the ASQ Software Quality Engineering Course
<b>Competency 5.</b> Shall demonstrate a working level knowledge of the safety software requirements specification concepts such as those	<b>v</b>			This competency is met by the ASQ Software Quality Engineering Course

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described in ANSI/IEEE 830, <i>IEEE Guide to Software Requirements Specifications</i> and Section 3 of NUREG/CR-6263, <i>High Integrity Software for Nuclear Power Plants</i> .				
<b>Competency 6.</b> Shall demonstrate a familiarity level knowledge of the safety software design concepts as described in ANSI/IEEE 1016, <i>IEEE Recommended Practice for Software Design Descriptions</i> and Section 4 of NUREG/CR-6263, <i>High Integrity Software for Nuclear Power Plants</i> .	<b>v</b>			This competency is met by the ASQ Software Quality Engineering Course
<b>Competency 7.</b> Shall demonstrate a familiarity level knowledge of the safety software coding practices that ensure that software requirements specifications and design requirements are reflected in the source code.	<b>v</b>			This competency is met by the ASQ Software Engineering Course. The course does not contain detail information down to the coding (implementation) level. However it does provide information at the familiarity level.
<b>Competency 8.</b> Shall demonstrate a working level knowledge of the software verification and validation processes that ensure that the requirements specification, design, and coding of software adequately fulfill all intended safety functions. These processes are described in standards such as ANSI/IEEE 829, <i>IEEE Standard for Software Test Documentation</i> , ANSI/IEEE 1008, <i>IEEE Standard for Software Testing</i> , ANSI/IEEE 1012, <i>IEEE Standard for Software Verification and Validation Plans</i> , and Sections 6 – 8 of NUREG/CR-6263, <i>High Integrity Software for Nuclear Power Plants</i> .	<b>v</b>			This competency is met by the ASQ Software Quality Engineering Course
<b>Competency 9.</b> Shall demonstrate a working level knowledge of software safety analysis as described in documents such as IEEE 1228, <i>IEEE Standard for Software Safety Plans</i> and Section 9			<b>v</b>	This competency is not met. The risk management portion of the course covers some of the general concepts but there is little specific safety related information. Most DOE safety software quality assurance personnel are familiar with

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of NUREG/CR-6263, <i>High Integrity Software for Nuclear Power Plants</i> .				system safety concepts that can be applied to software.
<b>Competency 10.</b> Shall demonstrate a working level knowledge of activities that ensure that safety software is properly maintained and continues to operate as intended as described in such documents as IEEE 1219, <i>IEEE Standard for Software Maintenance</i> and Section 10 of NUREG/CR-6263, <i>High Integrity Software for Nuclear Power Plants</i> .	<b>v</b>			This competency is met by the ASQ Software Quality Engineering Course
<b>Competency 11.</b> Shall demonstrate a working level knowledge of software configuration management processes that ensure the integrity of executable code during the entire life cycle of safety software as described in documents such as ANSI/IEEE 828, <i>Software Configuration Management Plans</i> , ANSI/IEEE 1042, <i>Guide to Software Configuration Management</i> , and Section 11 of NUREG/CR-6263, <i>High Integrity Software for Nuclear Power Plants</i> .	<b>v</b>			This competency is met by the ASQ Software Quality Engineering Course
<b>Competency 12.</b> Shall demonstrate a working level knowledge of the elements of a successful software quality assurance program.	<b>v</b>			This competency is met by the ASQ Software Quality Engineering Course