CERTIFIED RELIABILITY ENGINEER (CRE)
BODY OF KNOWLEDGE MAP 2018

The Certified Reliability Engineer (CRE) Body of Knowledge (BOK) has been updated to ensure that the most current state of reliability practice is being tested in the examination. If you would like more information on how a BOK is updated, see a description of the process on http://asq.org/cert/faq/create-body-of-knowledge.

Part of the updating process is to conduct a job analysis survey to determine whether the topics in the 2009 BOK are still relevant to the job role of reliability engineers and to identify any new topics that have emerged since that BOK was developed. The results of the CRE job analysis survey showed that nearly all of the topics that were in the 2009 BOK are still relevant to the job roles of reliability engineers. Eight (8) new topics were added to the 2018 BOK, as indicated in Table 1.

The 2018 Certified Reliability Engineer Body of Knowledge (CRE BOK) will be introduced at the January 1, 2018 administration. Both BOKs will be available online until March 1, 2018, at which time the 2009 BOK will be removed.

General comments about ASQ Body of Knowledge updates

When the Body of Knowledge (BOK) is updated for an ASQ exam, the majority of the material covered in the BOK remains the same. There are very few programs that change significantly over a 5-7 year period. One of the points that we make to all of the exam development committees is that ASQ Certification Exams need to reflect "the state of practice" not "the state of the art" – this helps to keep the programs grounded in what people currently do, rather than being driven by the latest hot-topic improvement idea or trend. Typically, the biggest change in any updated BOK is in how the content is organized. When a new BOK is announced and posted on the ASQ website, we also include a "BOK Map" that highlights the changes between the two Bodies of Knowledge: old and new. The BOK map also clearly identifies any new content that has been added to the exam, as well as any content that has been removed from the exam.

With regard to exam preparation materials, you should be able to use any of the reference books that are currently listed on the bibliography for the exam program. These are the source materials that the exam development committees use to write questions and verify answers.

Specific comments about the 2018 CRE Body of Knowledge updates

The 2018 CRE BOK has been organized in a way that brings together some topics that had previously been presented throughout the BOK document, including topics related to risk (now all in the major area II. Risk Management) and data management (now all in the topic area III.B. Data Management) and the sequence of the topics is intended to align with the overall lifecycle process, with the first major area focusing on those fundamentals a reliability engineer needs to perform well in the role.

While there are eight new topics added to the 2018 CRE BOK, two of these topics appeared in the 2009 BOK as part of the subtext. This means the topic had been included alongside another topic in the prior BOK and now plays a slightly stronger role in a reliability engineer's work today. These topics include root cause analysis and risk mitigation plans.

Two other new topics are a refinement and clarification of topics that had appeared in the 2009 BOK, including the economics of product maintainability and availability and risk management techniques.

In addition to the new topics, there were 13 increases as well as 13 decreases to the level of cognition associated with particular topics.

Table 1 starting on Page 3 presents the 2018 CRE BOK and maps the topics to the 2009 BOK and includes details of the **new** topics added to the 2018 BOK.

Of the sixteen topics that were removed from the BOK, and are no longer included in the 2018 BOK, there are five topics that had parts of its concept incorporated into others areas of the 2018 BOK in a more meaningful way. These include warranty management, customer needs assessment, non-parametric statistical methods, parts obsolescence management, and data management.

Table 2 starting on Page 11 presents the 2009 CRE BOK and maps the topics to the 2018 BOK and includes details of topics removed from the BOK.

Table 1. 2018 CRE BOK mapped to the 2009 CRE BOK

2009 BOK Code	2018 BOK Details	New Elements in 2018 BOK
	I. Reliability Fundamentals [25 test questions]	
	A. Leadership Foundations	
I.A.1	**1. Benefits of reliability engineering** Describe the value that reliability has on achieving company goals and objectives, and how reliability engineering techniques and methods improve programs, processes, products, systems, and services. (Understand)	
I.A.2	**2. Interrelationship of safety, quality, and reliability** Describe the relationship of and distinguish between reliability and quality, and describe the importance of safety in reliability engineering and how reliability impacts safety. (Understand)	
	3. Reliability engineer leadership responsibilities Describe how to be a reliability champion by influencing program decisions and facilitating cross functional communication. (Understand)	New topic for the BOK
I.C.2	**4. Reliability engineer role and responsibilities in the product lifecycle** Describe how the reliability engineer influences the product lifecycle, and describe a reliability engineer's role in the design review process in order to anticipate how reliability can impact risk and costs, and ensure performance over time. (Understand)	
I.A.3	**5. Function of reliability in engineering** Describe how reliability techniques can be used to apply best practices in engineering (e.g., measuring reliability early), how industry standards can impact reliability, and how reliability can inform the decision analysis process. (Analyze)	Increase in level of cognition.
I.C.1	**6. Ethics in reliability engineering** Identify appropriate ethical behaviors for a reliability engineer in various situations. (Evaluate)	
I.A.8	**7. Supplier reliability assessments** Explain how supplier reliability impacts the overall reliability program and describe key reliability concepts that should be included in supplier reliability assessments. (Analyze)	Increase in level of cognition.
	8. Performance monitoring Describe the importance of performance monitoring to ensure that product reliability or safety requirements continue to be met, and identify lifecycle points in which process and product reliability data are collected and evaluated. (Understand)	New to the BOK

2009 BOK Code	2018 BOK Details	New Elements in 2018 BOK
	B. Reliability Foundations	
I.B.1 II.A.3 (bathtub curve only) III.B.4	**1. Basic reliability terminology** Explain basic terms related to reliability and the associated metrics (e.g., MTTF, MTBF, MTTR, service interval, maintainability, availability, failure rate, reliability, and bathtub curve.). (Apply)	Decrease in level of cognition.
I.A.5 (liability only) I.B.2	**2. Drivers of reliability requirements and targets** Describe how customer expectations and industry standards, safety, liability, and regulatory concerns drive reliability requirements. (Understand)	
VII.B.2 VII.B.3	**3. Corrective and preventive action (CAPA)** Identify corrective and preventive actions to take in specific situations and evaluate their measures of effectiveness. (Evaluate)	
	4. Root cause analysis Describe root cause analysis, and use a root cause and failure analysis tool to determine the causes of degradation or failure. (Evaluate)	New to the BOK
I.B.4	**5. Product lifecycle engineering stages** Describe the impact various lifecycle stages (concept/design, development/test, introduction, growth, maturity, decline) have on reliability, and the cost issues (product maintenance, life expectation, software defect phase containment, etc.) associated with those stages. (Understand)	
VI.A.3	**6. Economics of product maintainability and availability** Describe the cost tradeoffs associated with product maintainability strategies and availability. (Understand)	Decrease in level of cognition.
I.B.4	**7. Cost of poor reliability** Describe how poor reliability affects costs over the lifecycle. (Understand)	
	8. Quality triangle Describe the relationship among cost, time and quality with respect to reliability. (Understand)	New topic to the BOK
I.A.4	**9. Six sigma methodologies** Describe how six sigma principles support reliability engineering. (Understand)	Decrease in level of cognition.

2009 BOK Code	2018 BOK Details	New Elements in 2018 BOK
I.B.6	**10. Systems engineering and integration** Describe the role of reliability engineering within systems engineering, including the integration of components and their interfaces/interactions within the system. (Understand)	
	II. Risk Management [25 test questions]	
	A. Identification	
I.C.3	**1. Risk management techniques** Use risk management tools and processes to identify, document and track concerns. Identify and prioritize safety, economic, performance, and customer satisfaction concerns utilizing an appropriate risk management framework. (Analyze)	While risk management tools were in the 2009 BOK, the 2018 BOK now requires Reliability Engineers to use these tools in a within a risk management framework.
I.B.3	**2. Types of risk** Identify the various types of risks, including technical, scheduling, safety, and financial, and describe their relationship to reliability. (Analyze)	Increase in level of cognition.
	B. Analysis	
I.C.3 (FTA only) **III.A.5 (FTA only)**	**1. Fault tree analysis (FTA)** Use fault tree analysis (FTA) techniques to evaluate product or process failure. (Analyze)	
I.C.3 (FMEA only) **III.A.3**	**2. Failure mode and effects analysis (FMEA)** Define and distinguish between failure mode and effects analysis (FMEA) and failure mode, effects, and criticality analysis (FMECA) and apply these techniques to systems, products, processes, and designs. (Evaluate)	Increase in level of cognition.
III.A.4	**3. Common mode failure analysis** Describe common mode failure (also known as common cause failure) and how it affects risk. (Understand)	
I.C.3 (hazard analysis only)	**4. Hazard analysis** Describe how hazard analysis informs the development process, and how information obtained as a result of the hazard analysis is used by the reliability engineer. (Understand)	Decrease in level of cognition.
I.C.3 (risk matrix only)	**5. Risk matrix** Describe how risk matrices are used in the assessment of risk in regard to likelihood and severity. (Understand)	Decrease in level of cognition.

2009 BOK Code	2018 BOK Details	New Elements in 2018 BOK
I.C.3	**6. System safety** Identify safety-related issues by analyzing customer feedback, design data, field data, and other information. Prioritize safety concerns, and identify steps that will minimize the improper use of equipment, products or processes. (Evaluate)	Increase in level of cognition.
I.A.5 (liability only) III.B.3 (risk mitigation plans only)	**C. Mitigation** Identify appropriate risk mitigation (treatment) plans to include controls that will minimize risk and subsequent impact in terms of safety, liability, and regulatory compliance. (Evaluate)	Increase in level of cognition.
	III. Probability and Statistics for Reliability [35 test questions]	
	A. Basic Concepts	
II.A.1 II.A.5 (terms of parametric and non-parametric only) II.B.3	**1. Basic statistics** Define various basic statistical terms (e.g., population, parameter, statistic, sample, the central limit theorem, parametric and non-parametric), and compute and interpret their values. (Analyze)	Decrease in level of cognition.
II.A.2	**2. Basic probability concepts** Use basic probability concepts (e.g., independence, mutually exclusive, conditional probability), and compute and interpret the expected values. (Analyze)	Increase in level of cognition.
II.A.3	**3. Probability distributions** Compare and contrast various distributions (e.g., binomial, Poisson, exponential, Weibull, normal, and log-normal), and recognize their associated probability plots. (Analyze)	
II.A.3	**4. Probability functions** Compare and contrast various probability functions (e.g., cumulative distribution functions (CDFs), probability density functions (PDFs), and hazard functions), and recognize their application in various situations. (Apply)	Decrease in level of cognition.
II.A.6	**5. Sampling plans for statistics and reliability testing** Use various theories, tables, and formulas to determine appropriate sample sizes or testing time for statistical and reliability testing. (Apply)	
II.A.7	**6. Statistical process control (SPC) and process capability studies (C_p, C_{pk})** Define and describe SPC and process capability studies (C_p, C_{pk}, etc.), control charts, and how each is related to reliability. (Understand)	

2009 BOK Code	2018 BOK Details	New Elements in 2018 BOK
II.B.1 **II.B.2**	**7. Confidence and tolerance intervals** Compute confidence intervals and tolerance intervals, draw conclusions from the results, and describe how point estimates are used to determine the interval. (Evaluate)	
	B. Data Management	
I.A.6 **(warranty data only)** **I.A.7** **(prototyping data only)** **IV.A.1**	**1. Sources and uses of reliability data** Describe sources of reliability data (prototype, development, test, field, warranty, published, etc.), their advantages and limitations, and how the data can be used to measure and enhance product reliability. (Analyze)	Increase in level of cognition.
VII.A.1	**2. Types of data** Identify and distinguish between various types of data (e.g., attributes vs. variable, discrete vs. continuous, censored vs. complete, and univariate vs. multivariate). Select appropriate analysis tools based on the data type. (Evaluate)	
VII.A.2	**3. Data collection methods** Identify and select appropriate data collection methods (e.g., surveys, automated tests, automated monitoring and reporting tools) in order to meet various data analysis objectives and data quality needs. (Evaluate)	
VII.B.1	**4. Data summary and reporting** Examine collected data for accuracy and usefulness. Analyze, interpret, and summarize data for presentation using various techniques, based on data types, sources, and required output. (Create)	
VII.C.1	**5. Failure analysis methods** Describe failure analysis tools and methods (e.g., mechanical, materials, physical analysis, and scanning electron microscopy (SEM)) that are used to identify failure mechanisms. (Understand)	
VII.C.2	**6. Failure reporting, analysis, and corrective action system (FRACAS)** Identify elements necessary for FRACAS, and demonstrate the importance of a closed-loop process. (Evaluate)	Increase in level of cognition.

2009 BOK Code	2018 BOK Details	New Elements in 2018 BOK
	IV. Reliability Planning, Testing, and Modeling [35 test questions]	
	A. Planning	
V.A.1 **V.B.3**	**1. Reliability test strategies** Develop and apply the appropriate test strategies (e.g., truncation, test-to-failure, degradation, growth plan, and test, analyze and fix (TAAF)) for various product development phases. (Evaluate)	Decrease in level of cognition.
I.A.6 (conditions of use only) **III.A.1**	**2. Environmental and conditions of use factors** Identify environmental and use factors (e.g., temperature, humidity, and vibration) and stresses (e.g., severity of service, electrostatic discharge (ESD), throughput, and duty cycle) to which a product may be subjected. (Analyze)	Increase in level of cognition.
I.A.5	**3. Failure consequence** Describe the importance of identifying the consequences of failure modes when establishing reliability acceptance criteria. (Understand)	
I.A.6 (failure criteria only)	**4. Failure criteria** Define and describe failure criteria based on system requirements and warranty terms and conditions. (Understand)	
V.A.2	**5. Test environment** Appraise the environment in terms of system location and operational conditions, and designate the environment in the test plan to ensure an appropriate test strategy is implemented. (Evaluate)	
	B. Testing Describe the purpose, advantages, and limitations of each of the following types of tests, and use common models to develop test plans, evaluate risks, and interpret test results. (Evaluate)	
V.B.1 **V.B.2**	**1. Accelerated life tests (single-stress, multiple-stress, sequential stress, step-stress, HALT, margin tests)**	
V.C.4	**2. Stress screening (ESS, HASS, burn-in tests)**	
V.C.1	**3. Qualification/demonstration testing (sequential tests, fixed-length tests)**	
V.C.6	**4. Degradation (wear-to-failure) testing**	
V.B.4	**5. Software Testing (white-box, black-box, operational profile, and fault-injection)**	

2009 BOK Code	2018 BOK Details	New Elements in 2018 BOK
	C. Modeling	
IV.A.2	**1. Reliability block diagrams and models** Generate and analyze various types of block diagrams and models, including series, parallel, partial redundancy, and time-dependent. (Evaluate)	Decrease in level of cognition.
IV.A.3	**2. Physics of failure and failure mechanisms** Identify various potential failure mechanisms (e.g., fracture, corrosion, memory corruption) and describe the physical process of these failures. (Apply)	
IV.A.3	**3. Failure models** Select appropriate theoretical models (e.g., Arrhenius, S-N curve) to assess or predict failure rates. (Analyze)	Increase in level of cognition.
IV.A.4 **IV.B.1** **IV.B.2**	**4. Reliability prediction methods** Use various reliability prediction methods (e.g., Monte Carlo Simulation, part stress analysis, and parts count prediction) for both repairable and non-repairable components and systems, and describe the inputs into the model. (Apply)	
I.A.7 **(design prototyping only)**	**5. Design prototyping** Describe the advantages and limitations of prototyping to enhance product reliability. (Understand)	Decrease in level of cognition.
	V. Lifecycle Reliability [30 test questions]	
	A. Reliability Design Techniques	
I.B.5	**1. Design evaluation techniques (validation and verification)** Explain how validation, verification, and other review techniques are used to assess the reliability of a product's design at various lifecycle stages. (Apply)	Increase in level of cognition.
III.A.2	**2. Stress-strength analysis** Apply the stress-strength analysis method of calculating probability of failure, and interpret the results. (Analyze)	Decrease in level of cognition.
III.A.7	**3. Design of experiments (DOE)** Develop and interpret the results of a standard design of experiments (DOE) (e.g., full-factorial and fractional factorial). (Analyze)	

2009 BOK Code	2018 BOK Details	New Elements in 2018 BOK
III.A.9	**4. Reliability optimization** Use various approaches to optimize reliability within the constraints of cost, schedule, weight, and other design requirements. (Apply)	
I.C.3 (steps to minimize misuse only) III.A.10	**5. Human factors** Describe the relationship between human factors and reliability engineering, including user safety, user and usage profiles, failure modes and mechanisms. (Understand)	Decrease in level of cognition.
III.A.11 VI.B.4	**6. Design for X (DFX)** Apply DFX techniques such as design for manufacturability, testability, and maintainability. (Apply)	
III.A.8	**7. Design for Reliability** Apply DfR in order to meet reliability requirements throughout the product or system lifecycle. Understand how built-in reliability and fault tolerance/avoidance are key goals for design for reliability. (Evaluate)	Increase in level of cognition.
	B. Parts and Systems Development	
III.B.2	**1. Materials and components selection techniques** Apply techniques (e.g., derating and Commercial off-the-shelf (COTS)) for selecting materials and components to meet reliability goals and requirements. (Analyze)	
III.B.1	**2. Parts standardization and system simplification** Describe the importance of standardization, simplification, and parts re-use to meet reliability goals and requirements. (Apply)	
	C. Maintainability	
VI.A.2 VI.B.5 VI.A.1	**1. Maintenance strategies** Develop a maintenance plan incorporating various strategies (e.g., predictive maintenance, repair or replace decision making, spare parts analysis/forecasting, and equipment warranties). (Apply)	Decrease in level of cognition.
VI.B.1	**2. Preventive maintenance (PM) analysis** Define and use PM tasks, optimum PM intervals, and other elements of this analysis. Identify situations when PM is not effective. (Apply)	
VI.B.2	**3. Corrective maintenance analysis** Describe and apply the elements of corrective maintenance analysis (e.g., fault-isolation time, repair/replace time, skill level, and crew hours). (Apply)	

Table 2. 2009 CRE BOK mapped to the 2018 CRE BOK

2009 BOK		2018 BOK		Notes
Number	**Label**	**Number**	**Label**	
I.A.1	Benefits of reliability engineering	**I.A.1**	Benefits of reliability engineering	
I.A.2	Interrelationship of safety, quality, and reliability	**I.A.2**	Interrelationship of safety, quality, and reliability	
I.A.3	Role of the reliability function in the organization	**I.A.5**	Function of reliability in engineering	
I.A.4	Reliability in product and process development	**I.B.9**	Six sigma methodologies	The concepts of concurrent engineering, corporate improvement and lean were removed from the BOK; specific emerging technologies were included in the 2016 job analysis survey, none of which passed the final criteria to be included in the final BOK.
I.A.5	Failure consequence and liability management	**IV.A.3**	Failure consequence	Liability management is removed but the concept of liability is now incorporated within the 2018 area I.B.2 (Drivers of reliability requirements and targets) and II.C (Mitigation).
I.A.6	Warranty management	**Removed from BOK**		While the general topic of warranty management has been removed from the BOK, uses of warranty data is in 2018 area III.B.1 (Sources and uses of reliability data); failure criteria and warranty terms and conditions is in 2018 area IV.A.4 (Failure criteria); and conditions of use is now in 2018 area IV.A.2 (Environmental and conditions of use factors).
I.A.7	Customer needs assessment	**Removed from BOK**		While the general topic of customer needs assessment has been removed, design prototyping is in 2018 area IV.C.5 and data from prototyping is in 2018 area III.B.1 (Sources and uses of reliability data).
I.A.8	Supplier reliability	**I.A.7**	Supplier reliability assessments	
I.B.1	Terminology	**I.B.1**	Basic reliability terminology	
I.B.2	Elements of a reliability program	**I.B.2**	Drivers of reliability requirements and targets	
I.B.3	Types of risk	**II.A.2**	Types of risk	

2009 BOK		2018 BOK		Notes
Number	**Label**	**Number**	**Label**	
I.B.4	Product lifecycle engineering	**I.B.5**	Product lifecycle engineering stages	
I.B.5	Design evaluation	**V.A.1**	Design evaluation techniques (validation and verification)	
I.B.6	Systems engineering and integration	**I.B.10**	Systems engineering and integration	
I.C.1	Ethical issues	**I.A.6**	Ethics in reliability engineering	
I.C.2	Roles and responsibilities	**I.A.4**	Reliability engineer role and responsibilities in the product lifecycle	
I.C.3	System safety	**II.B.6**	System safety	Note that the topics of hazard analysis, FMEA, FTA, and risk matrix were moved to the 2018 BOK area of II.B. The steps to minimize misuse of products and processes is considered part of the 2018 area V.A.5 (Human factors).
II.A.1	Statistical terms	**III.A.1**	Basic statistics	
II.A.2	Basic probability concepts	**III.A.2**	Basic probability concepts	
II.A.3	Discrete and continuous probability distributions	**III.A.3** **III.A.4**	Probability distributions Probability functions	Bathtub curve was moved to 2018 area I.B.1 as a terminology topic only.
II.A.4	Poisson process models	**Removed from BOK**		
II.A.5	Non-parametric statistical methods	**Removed from BOK**		The terminology of parametric and non-parametric remains in the 2018 area III.A.1 (Basic statistics).
II.A.6	Sample size determination	**III.A.5**	Sampling plans for statistics and reliability testing	
II.A.7	Statistical process control (SPC) and process capability	**III.A.6**	Statistical process control (SPC) and process capability studies (C_p, C_{pk})	
II.B.1	Point estimates of parameters	**III.A.7**	Confidence and tolerance intervals	
II.B.2	Statistical interval estimates	**III.A.7**	Confidence and tolerance intervals	
II.B.3	Hypothesis testing (parametric and non-parametric)	**III.A.1**	Basic statistics	The 2018 BOK includes this topic in area III.A.1 by stating “and compute and interpret their values”.

2009 BOK		2018 BOK		Notes
Number	**Label**	**Number**	**Label**	
III.A.1	Environmental and use factors	**IV.A.2**	Environmental and conditions of use factors	
III.A.2	Stress-strength analysis	**V.A.2**	Stress-strength analysis	
III.A.3	FMEA and FMECA	**II.B.2**	Failure mode and effects analysis (FMEA)	
III.A.4	Common mode failure analysis	**II.B.3**	Common mode failure analysis	
III.A.5	Fault tree analysis (FTA) and success tree analysis (STA)	**II.B.1**	Fault tree analysis (FTA)	Success tree analysis (STA) was removed from the 2018 BOK.
III.A.6	Tolerance and worst-case analyses	**Removed from BOK**		
III.A.7	Design of experiments	**V.A.3**	Design of experiments (DOE)	
III.A.8	Fault tolerance	**V.A.7**	Design for reliability (DfR)	
III.A.9	Reliability optimization	**V.A.4**	Reliability optimization	
III.A.10	Human factors	**V.A.5**	Human factors	
III.A.11	Design for X (DFX)	**V.A.6**	Design for X (DFX)	
III.A.12	Reliability apportionment (allocation) techniques	**Removed from BOK**		
III.B.1	Selection, standardization, and reuse	**V.B.2**	Parts standardization and system simplification	
III.B.2	Derating methods and principles	**V.B.1**	Materials and components selection techniques	Derating only in relation to selecting materials and components
III.B.3	Parts obsolescence management	**Removed from BOK**		The specific topic of parts obsolescence management is removed, but the topic of risk mitigation plans (which was part of this sub-text in 2009) is in 2018 area II.C (Mitigation). Note that the concept of parts development is in 2018 area V.B. (Parts and systems development).

2009 BOK		2018 BOK		Notes
Number	**Label**	**Number**	**Label**	
III.B.4	Establishing specifications	**I.B.1**	Basic reliability terminology	
IV.A.1	Sources and uses of reliability data	**III.B.1**	Sources and uses of reliability data	
IV.A.2	Reliability block diagrams and models	**IV.C.1**	Reliability block diagrams and models	
IV.A.3	Physics of failure models	**IV.C.2** **IV.C.3**	Physics of failure and failure mechanisms Failure models	
IV.A.4	Simulation techniques	**IV.C.4**	Reliability prediction methods	Monte Carlo is included as a prediction method; Markov models have been removed from BOK
IV.A.5	Dynamic reliability	**Removed from BOK**		
IV.B.1	Part count predictions and part stress analysis	**IV.C.4**	Reliability prediction methods	
IV.B.2	Reliability prediction methods	**IV.C.4**	Reliability prediction methods	
V.A.1	Reliability test strategies	**IV.A.1**	Reliability test strategies	
V.A.2	Test environment	**IV.A.5**	Test environment	
V.B.1	Accelerated life tests	**IV.B.1**	Accelerated life tests	
V.B.2	Discovery testing	**Removed from BOK**		
V.B.3	Reliability growth testing	**IV.A.1**	Reliability test strategies	
V.B.4	Software testing	**IV.B.5**	Software Testing	
V.C.1	Qualification/demonstration testing	**IV.B.3**	Qualification/demonstration testing	
V.C.2	Product reliability acceptance testing	**Removed from BOK**		

2009 BOK		2018 BOK		Notes
Number	**Label**	**Number**	**Label**	
V.C.3	Ongoing reliability testing	**Removed from BOK**		
V.C.4	Stress screening	**IV.B.2**	Stress screening	
V.C.5	Attribute testing	**Removed from BOK**		
V.C.6	Degradation	**IV.B.4**	Degradation (wear-to-failure) testing	
VI.A.1	Planning	**Removed from BOK**		
VI.A.2	Maintenance strategies	**V.C.1**	Maintenance strategies	
VI.A.3	Availability tradeoffs	**I.B.6**	Economics of product maintainability and availability	
VI.B.1	Preventive maintenance (PM) analysis	**V.C.2**	Preventive maintenance (PM) analysis	
VI.B.2	Corrective maintenance analysis	**V.C.3**	Corrective maintenance analysis	
VI.B.3	Non-destructive evaluation	**Removed from BOK**		
VI.B.4	Testability	**V.A.6**	Design for X (DFX)	
VI.B.5	Spare parts analysis	**V.C.1**	Maintenance strategies	
VII.A.1	Types of data	**III.B.2**	Types of data	
VII.A.2	Collection methods	**III.B.3**	Data collection methods	
VII.A.3	Data management	**Removed from BOK**		Concepts for data management are included in the major BOK area III.B.
VII.B.1	Data summary and reporting	**III.B.4**	Data summary and reporting	

2009 BOK		2018 BOK		Notes
Number	**Label**	**Number**	**Label**	
VII.B.2	Preventive and corrective action	**I.B.3**	Corrective and preventive action (CAPA)	
VII.B.3	Measures of effectiveness	**I.B.3**	Corrective and preventive action (CAPA)	
VII.C.1	Failure analysis methods	**III.B.5**	Failure analysis methods	
VII.C.2	Failure reporting, analysis, and corrective action system (FRACAS)	**III.B.6**	Failure reporting, analysis, and corrective action system (FRACAS)	