



# DEFENSE ACQUISITION UNIVERSITY

## LOG 103 Reliability, Availability, and Maintainability (RAM)

110614

*Course Learning/Performance Objectives followed by its enabling learning objectives on separate lines if specified.*

<b>1</b>	<p><b>Review the historical development of RAM legislature, policy and integration within DoD systems acquisition</b></p> <ul style="list-style-type: none"> <li>Identify significant events that transformed and improved reliability</li> <li>Identify documentation used to write current RAM policy</li> <li>Identify how RAM impacts sustainment and cost</li> <li>Identify how developmental test and evaluation aids RAM achievement</li> <li>Identify the means for achieving RAM within the systems engineering process</li> <li>Identify how RAM aids supportability and impacts logistics</li> <li>Recognize the purpose of operational test and evaluation</li> <li>Identify the difference between operational effectiveness and suitability</li> </ul>
<b>2</b>	<p><b>Recognize the impact of acquisition reform on Reliability, Availability, and Maintainability (RAM).</b></p> <ul style="list-style-type: none"> <li>Recall the scope and impact of the Perry Memorandum</li> <li>Indicate how the discontinuance of military standards and specifications impacted RAM</li> <li>Identify how the loss of workforce and skilled personnel impacted RAM</li> <li>Recognize how the use of commercial-off-the-shelf items impacted RAM.</li> <li>Indicate how poor RAM design and performance decreased effectiveness and suitability, as identified during OT&amp;E.</li> <li>Identify how RAM and supportability affect early systems engineering activities and sustainment planning</li> </ul>
<b>3</b>	<p><b>Recognize how the Availability Key Performance Parameter (KPP) and the Materiel Reliability and Ownership Cost Key System Attributes (KSA) strengthen Reliability, Availability, and Maintainability (RAM)</b></p> <ul style="list-style-type: none"> <li>Identify the origin of the Availability KPP, the Material Reliability KSA, and the Ownership Cost KSA</li> <li>Indicate the role of the Combat Developer in the refinement of the KPP/KSAs within the JCIDS process</li> <li>Recall how the DoD Reliability, Availability, Maintainability – Cost (RAM-C) Rationale Report Manual is used to calculate the availability KPP and its KSAs</li> <li>Recognize the use of enabling technologies in meeting availability KPP/KSA requirements.</li> </ul>
<b>4</b>	<p><b>Recognize the impact of recent legislation and DoD policy on RAM processes.</b></p> <ul style="list-style-type: none"> <li>Identify the impacts of defense policy on RAM, per the GAO report</li> <li>Identify the impact of the DOT&amp;E 2007 Report on RAM</li> <li>Identify the impact of the Defense Science Board Task Force on Developmental Test &amp; Evaluation on RAM</li> <li>Identify the impact of the Reliability Improvement working Group (RIWG) on RAM</li> <li>Indicate the impact of the 2008 AT&amp;L Memorandum on RAM</li> <li>Indicate the impact of DoDI 5000.02 on RAM</li> <li>Indicate the impact of the Weapons System Acquisition Reform Act of 2009 on RAM</li> <li>Indicate the impact of the Weapon System Acquisition Reform Product Support Assessment Report of November 2009 on RAM</li> <li>Recognize the changes to the Defense Acquisition Guidebook (DAG) as a result of legislation and acquisition policy changes.</li> <li>Recall how changes in the JCIDS process improved RAM requirements</li> <li>Identify how reliability growth programs have been implemented</li> <li>Recall how integrating Developmental Testing (DT) and Operational Testing (OT) strengthen RAM</li> </ul>
<b>5</b>	<p><b>Recognize the elements of a Performance-Based Life Cycle Product Support strategy and how RAM is a key element in achieving metric goals.</b></p> <ul style="list-style-type: none"> <li>Recall the definition of reliability.</li> <li>Recall the definition of logistics reliability parameters.</li> <li>Recall the definition of maintainability.</li> <li>Distinguish between Reliability and Maintainability.</li> <li>Recall the Definition of Availability.</li> <li>Identify the role of Supportability Analysis/Maintenance Planning in defining Ownership Costs.</li> <li>Identify the Reliability, Availability and Maintainability Trade Spaces.</li> <li>Recall why RAM is a key driver in the development of a Performance-Based Product Support Strategy.</li> </ul>



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	Recall why RAM is a key driver in demand forecasting, spares planning, provisioning, and supply support.
	Recall why RAM is a key driver of Total Ownership Cost.
	Recall why RAM is a key driver of Sustainment Maturity Levels.
<b>6</b>	<b>Recognize how RAM measures are developed and addressed to enhance combat capability.</b>
	Identify why it is important that DoD have highly Reliable, Available, Maintainable and Affordable systems
	Identify RAM user requirements
	Define how the Joint Capabilities Integration and Development System (JCIDS) Process is related to RAM
	List the measures of combat capability that are enhanced by RAM
<b>7</b>	<b>Recognize how contractual requirements are developed from operational requirements.</b>
	Describe the methods for converting operational RAM requirements into contractual RAM requirements.
	Describe the methods for assessing and ensuring the RAM of commercial and non-developmental items.
<b>8</b>	<b>Identify how the design interface process and its associated trade space considerations promote the concept of Designing for Reliability</b>
	Identify Design Interface Concepts
	Define the Reliability Availability and Maintainability Trade Space Considerations
	Identify the process for Designing for Reliability
	Identify how Reliability Modeling techniques improve RAM
	State the objectives of the Failure Modes Effects and Criticality Analysis process
	Identify the purpose of Reliability Centered Maintenance Analysis
	Identify Reliability Prediction methods and uses
	Identify Reliability Activities
	Identify the process for Designing for Maintainability
	Distinguish among MDT, M(bar), and MTTR
	Identify how System Maintainability depends on the Reliability and Maintainability of its Subsystems
	Identify the purpose of Condition Based Maintenance
	Define Prognostics and Health Management (PHM)
<b>9</b>	<b>Identify how Reliability Growth and Test &amp; Evaluation programs reduce risk</b>
	List the Reliability Growth Program requirements
	Describe the Duane Model for Planning and Tracking Reliability Growth
	Identify how the DT&E Test-Analyze-Fix process contributes to reliability growth
	Identify decision risks in Reliability Qualification Testing (RQT)
	Identify how Statistical Test Plans are used in Reliability Qualification Testing (RQT)
	Recognize the importance of a contractual definition of failure
	Identify Government and Industry Best Practices In Test and Evaluation
<b>10</b>	<b>Recognize the impacts of manufacturing process anomalies on system RAM performance parameters</b>
	Recognize how stated RAM requirements drive the level of quality in the manufacturing processes
	Identify the impact of latent defects on performance and logistics
	Identify how field data is analyzed to determine the root causes of defects
	Show how to identify latent defect issues from field failure data
	Identify the techniques used to eliminate latent manufacturing process defects