



Technical Education Services Course Specification

Course Number: N3300

Course Title: CGM CR2 Computing Elements
Operation and Maintenance

Course Duration: 10 Days

Purpose:

The Cruiser Modernization (CGM) program and COTS-Refresh Phase 2 (CR2) have resulted in the development of a truly Open Architecture, Industry-standard, Commercial-off-the-Shelf version of the Aegis Combat system. Designed by Lockheed Martin, the CGM CR2 variant of Aegis combines Open Architecture hardware platforms with Concurrent Computer Corporation's RedHawk Operating System to provide the US Navy with an ultra-responsive, highly-reliable, easily maintainable Combat System.

Personnel who are responsible for the integration, testing and installation of the CGM CR2 variant require detailed knowledge of the Operation and Maintenance of the different hardware/software configurations used within the SPY, WCS/FCS, CND, ADS and ORTS computing elements of the Combat System. This includes the IBM BladeCenter, the Momentum VC-120 VME SBC, and the Germane Systems Network Attached Storage (NAS) server and DotHill SANnetII 200 disk array. It is the intention of this class to provide that level of knowledge to better prepare these personnel for their interface to this latest Aegis variant.

Intended Audience:

This course is intended for hardware engineers and technicians who are responsible for the integration, installation and corrective maintenance of the Aegis CGM CR2 Combat System processing elements. Due to the sensitive nature of the material presented during this class, only those personnel who are a verifiable part of the Aegis community will be accepted for enrollment.

Course Objectives:

Upon successful completion of this course students are able to:

- Provide a detailed overview of the configuration of the computer systems used in the SPY, WCS/FCS, CND, ADS and ORTS elements of the CGM CR2 variant of the Aegis Combat System, identifying the MCE cabinet in which each system is located, the node name assignments of each system, and the redundancy scheme implemented within each element.

- Perform Removal & Replacement procedures necessary to perform corrective maintenance on the following hardware platforms:
 1. IBM BladeCenter-T chassis, including the HS20-8843 Blade Servers, Cisco Intelligent Ethernet Switch Module and the BladeCenter Management Module.
 2. Momentum VC-120 SBC VME-based system components, including the SBC and NTDS VME modules.
 3. Germane Systems Network Attached Storage Server and DotHill SANnetII 200 Fibre-Channel Disk Array.
- Use both available Management Module interfaces to perform remote monitoring, control and configuration of the IBM BladeCenter components.
- Use the offline diagnostics available to verify correct functionality of the IBM HS20-8843 Blade Servers.
- Update all firmware components associated with the IBM BladeCenter, including the Management Module, BladeServer, Cisco Intelligent Ethernet Switch Module, and the Copper Pass-through Module.
- Use the Cisco Intelligent Ethernet Switch Module interfaces to perform remote monitoring and configuration of the switch module.
- Use the available Momentum VC-120 interfaces to perform configuration and testing of the Single Board Computer and associated components.
- Use the VMETRO VBT-325 VME Bus Analyzer to monitor VME Bus activity during the execution of the VME NTDS loopback test.
- Use the available interfaces to configure the Germane Systems Network Attached Storage server and DotHill SANnetII 200 Fibre-Channel Disk Array.

Prerequisites:

- LINUX System Capability - Students need to understand and be able to use basic LINUX system commands such as those taught in a LINUX introductory course.
- A working knowledge of the **vi** editor is assumed

Course Topic Outline:

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| <ul style="list-style-type: none"> I. CGM-CR2 Aegis Combat System Computing Assets Overview <ul style="list-style-type: none"> A. MCE Cabinet Descriptions & Configuration B. Computing Elements Overview C. Aegis LAN Interconnect System (ALIS) Configuration D. SPY Computing Elements Configuration. | (1 Day) |
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- E. WCS/FCS Computing Elements Configuration
- F. CND Computing Elements Configuration
- G. ADS Computing Elements Configuration
- H. ORTS Computing Elements Configuration
- I. Network Attached Storage Computing Elements Configuration
- II. BladeCenter System Operation & Maintenance (4 Days)
 - A. BladeCenter-T Chassis Functional Description
 - B. BladeCenter-T Chassis Power Distribution and Cooling
 - C. BladeCenter Management Module (MM) Functional Description
 - D. HS20-8843 BladeServer Functional Description
 - E. BladeCenter Copper Pass-through Module Functional Description
 - F. BladeCenter Cisco Intelligent Ethernet Switch Module (CIGESM) Functional Description
- III. Momentum VC-120 VME System Operation & Maintenance (2 Days)
 - A. VC-120 Functional Description
 - B. VMEBus Functional Description
 - C. VMETRO VBT-325 VME Bus Analyzer Operation
 - D. NTDS VME Module Functional Description
- IV. Network Attached Storage System Operation & Maintenance (3 Days)
 - A. Germane Systems Server Functional Description.
 - B. DotHill SANnetII 200 Fibre-Channel Disk Array Functional Description.
 - C. High-Availability Network File System Functional Overview.

Laboratory Exercises:

Students will practice Removal & Replacement procedures during the hands-on exercises to reinforce the information presented during lecture. Students will also use the available interfaces to perform configuration of all required components, including the BladeCenter Management Module, the Blade Server, the CIGESM module, the Momentum VC-120 Single Board Computer, the Network Attached Storage Server, and the Fibre-Channel Disk Array. When possible, the lab exercises are to be performed on an actual “shipset”. In cases where this is not possible, training systems will be provided to allow the performance of these exercises.