



Cooperative Engagement Capability (PMS-465) Verification, Validation, and Accreditation

OVERVIEW

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OUTLINE



- PURPOSE
- CEC ACCREDITATION PROCESS PLAN
- INITIAL CEP WASP ACCREDITATION
- E-2C OT-IIA2 ACCREDITATION SUPPORT
- HWIL SYSTEMS OT-IIA3 ACCREDITATION
- CEC USG-2 OPEVAL ACCREDITATION
- FUTURE ACCREDITATION SUPPORT
- SUMMARY



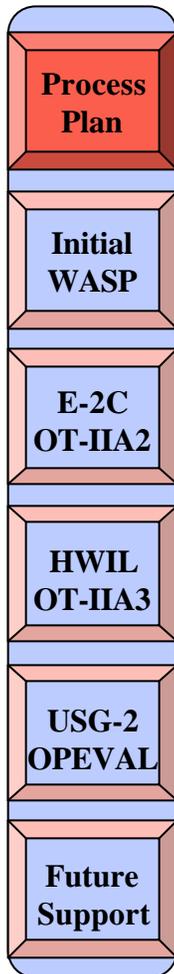
PURPOSE



- Provide overview of past, present, and future CEC VV&A activities
- Facilitate VV&A community discussion on issues addressed within the CEC VV&A activities



VV&A Process Plan



DRAFT

MODELING AND SIMULATION
ACCREDITATION PROCESS PLAN
FOR THE
COOPERATIVE ENGAGEMENT CAPABILITY
PROGRAM

14 June 2000

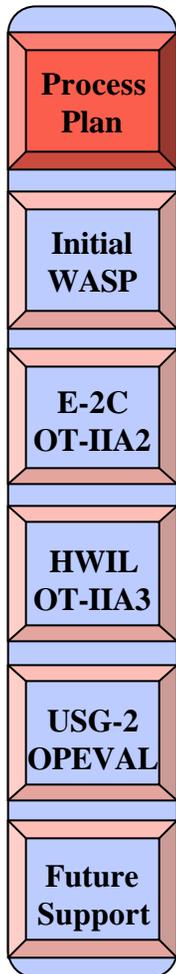
Prepared For
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- Provides description of CEC program
- Detailed description of the CEC VV&A process
- Provides two tailorings of the general process:
 - Hardware-In-the-Loop (HWIL) systems
 - Operational Test and Evaluation (OT&E)
- Provides sample document formats for all required VV&A documentation



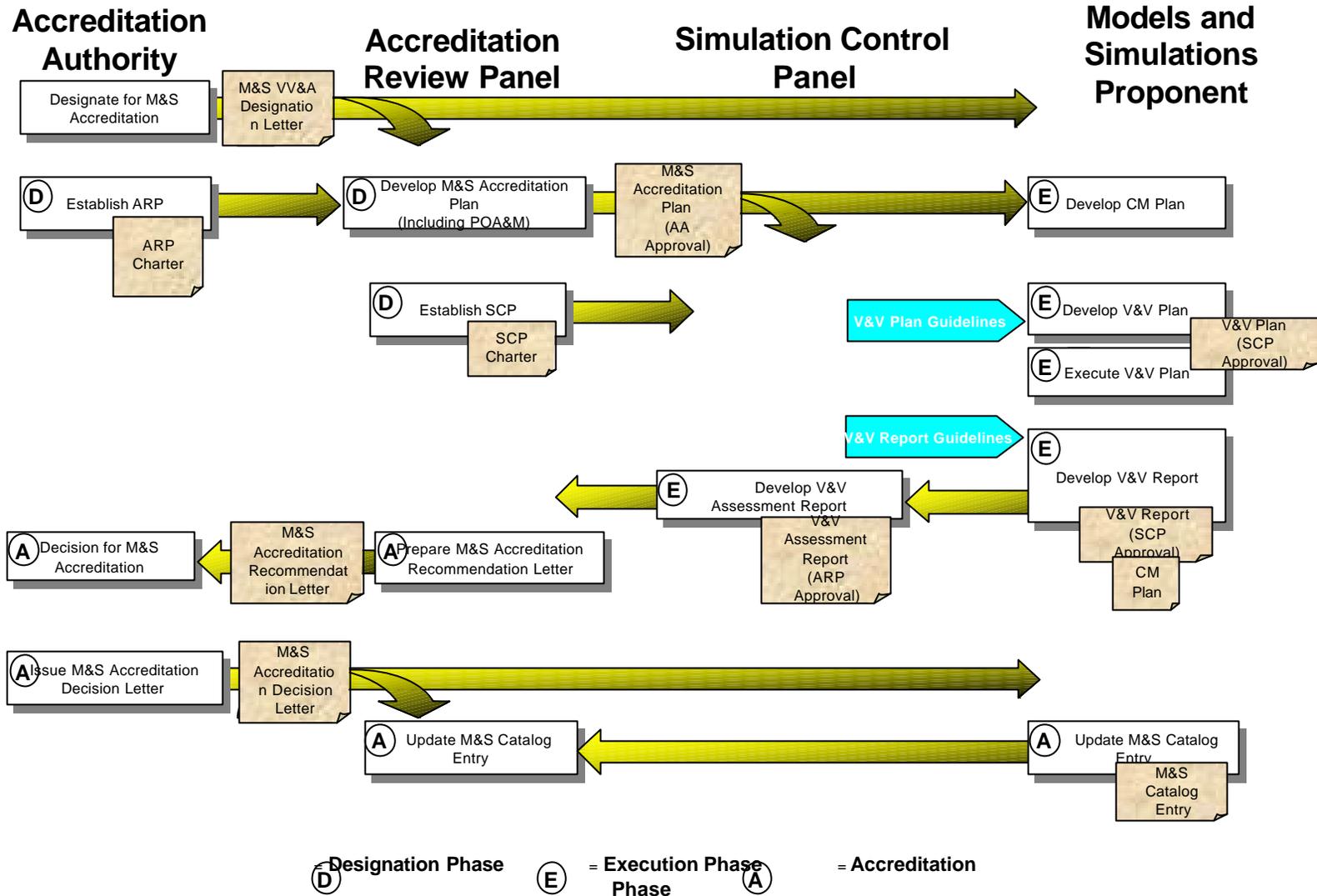
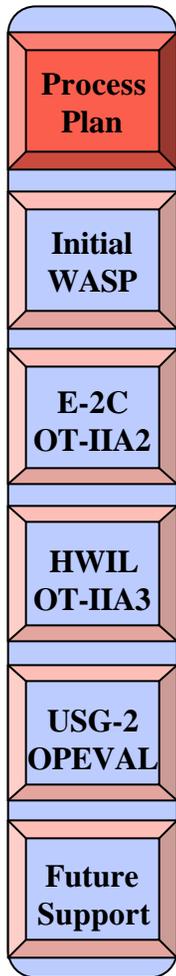
Process Description



- The CEC M&S VV&A process was derived from the DoD Recommended Practices Guide and other Navy M&S VV&A efforts, and satisfies the essence of the DoD, SECNAV, and PEO TSC VV&A instructions
- The process is characterized by:
 - Flexibility for various time and funding constraints
 - Rigorous requirements traceability
 - Intimate involvement by user and developer
- The process supports:
 - M&S for Engineering, Developmental Test, Operational Test, and Hardware-In-the-Loop (HWIL) Systems
 - Multi-Organization accreditation
 - Multiple PEO TSC program offices
- VV&A information captured on CEC M&S VV&A website

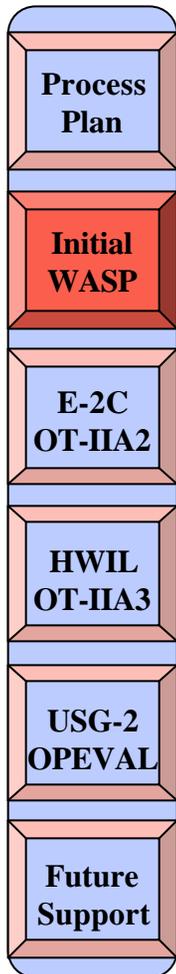


M&S VV&A Process Diagram





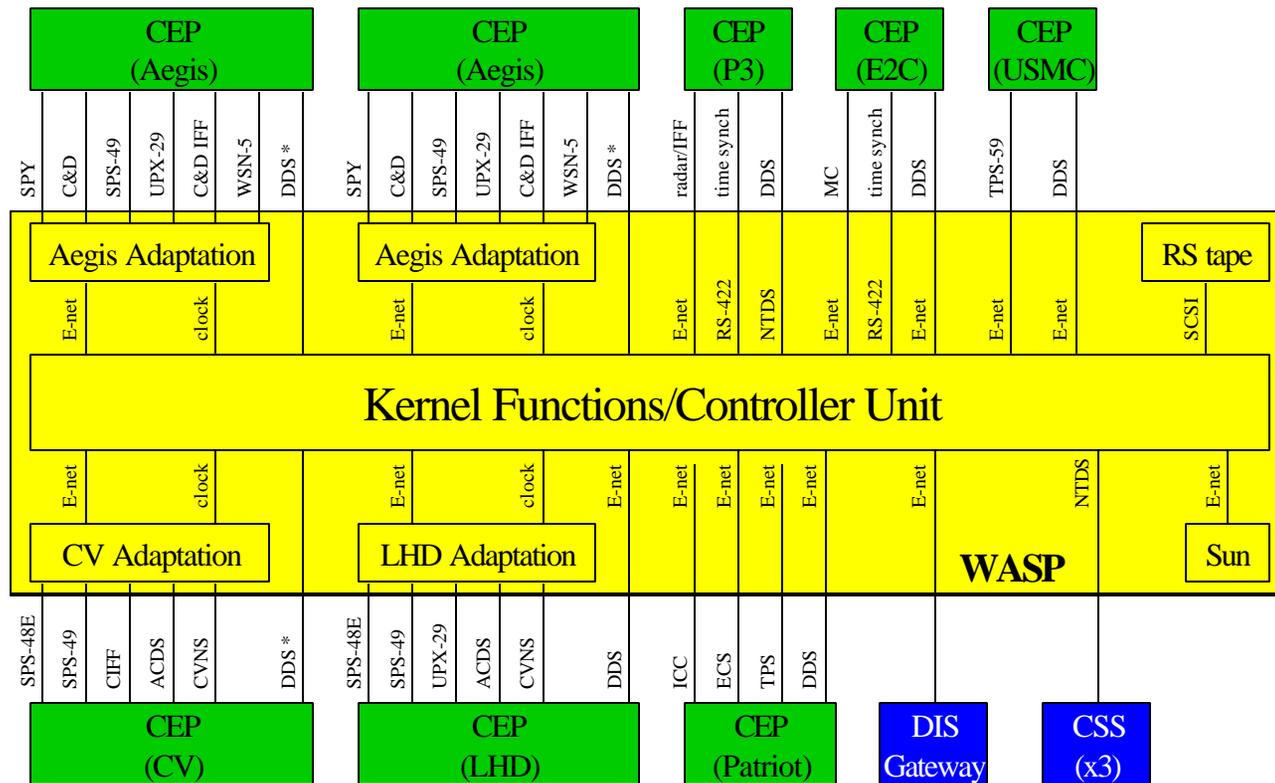
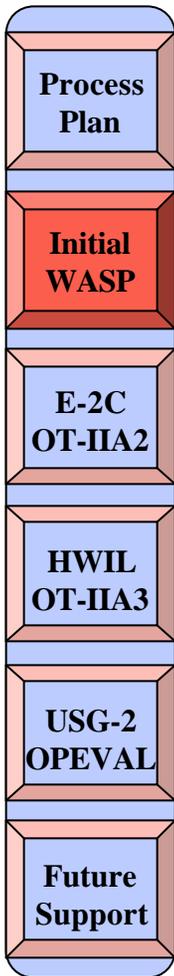
CEP WASP



- The CEP WASP is a real-time simulator designed and built at Johns Hopkins University Applied Physics Laboratory (JHU/APL).
- CEP WASP supports controlled and repeatable testing of the CEP by simulating the operational systems that interface with the CEP (i.e. DDS, sensor and combat systems) for up to 10 CEPs.
- The CEP WASP also allows playback of recorded live data
- 20+ units installed at 13 sites
- The CEP WASP is designed to run in either of two configurations, stand-alone or distributed.



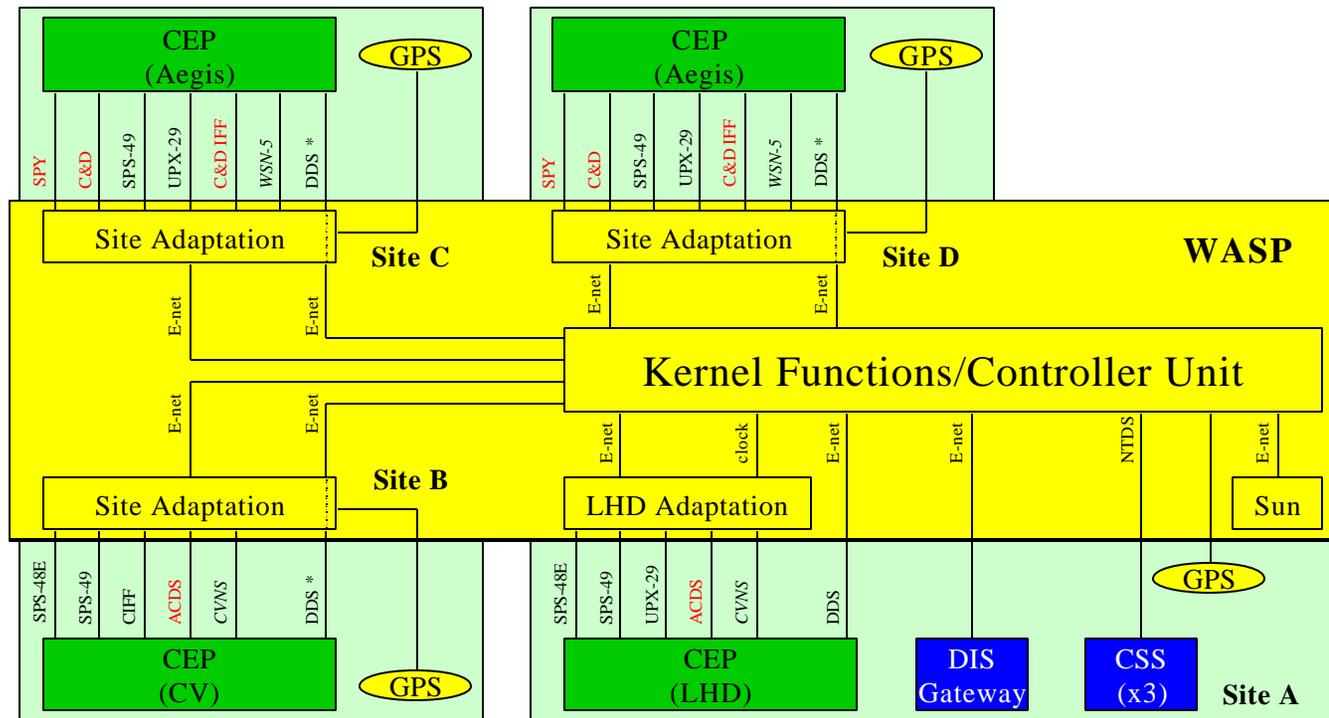
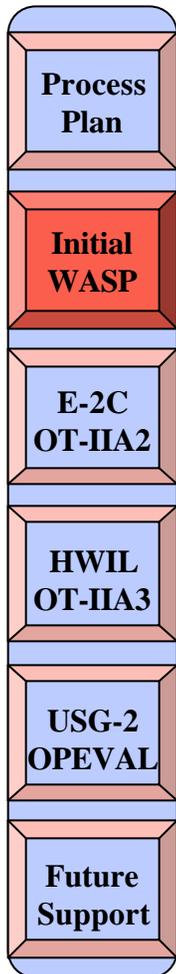
Single-Site Diagram



* USG-1 = NTDS, USG-2 = E-net



Distributed Diagram

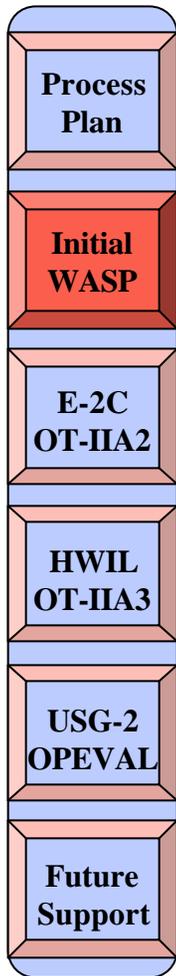


* USG-1 = NTDS, USG-2 = E-net

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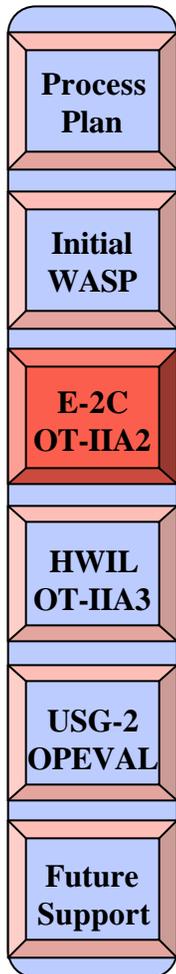
Initial Accreditation



- The Cooperative Engagement Processor Wrap-Around Simulation Program (CEP WASP) was the first VV&A process execution for the CEC program office
- Executed in 9 months
- Included 11 of 19 CEP WASP interfaces
- 18 limitations were identified, with several errors reported
- Over 660 pages created to support accreditation decision
- Accredited for 3 specific CEP intended uses:
 - CEP System Development at JHU/APL and Raytheon
 - Independent Verification and Validation (IV&V) testing
 - Developmental Test and Evaluation (DT&E) support
- Captured all VV&A data in a multi-volume documentation package



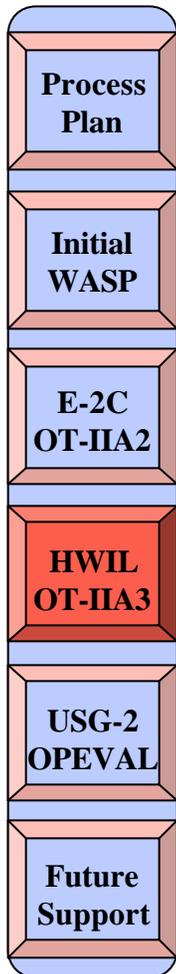
E-2C OT-IIA2 Accreditation



- Data results from completed Operational Assessment (OT-IIA2) would not be accepted by COMOPTEVFOR due to lack of HWIL accreditation for two facilities supporting the event
 - NAVSEA Dam Neck Multi-Function Land-Based Test Site
 - Surface Combat Systems Center Building AEGIS 6ph1R Lab
- VV&A team assisted MSPs with developing V&V data collection strategies to support accreditation
- Two V&V reports were provided to COMOPTEVFOR to support their accreditation
- COMOPTEVFOR accredited both HWIL systems on 8 February 2000



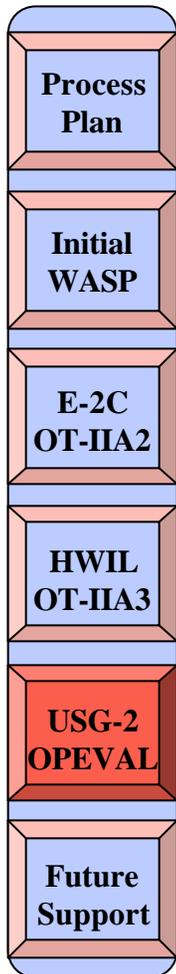
HWIL OT-IIA3 Accreditation



- CEC USG-2 Underway 10 / OT-IIA3 held 22-26 September 2000 in the VACAPES
- Accreditation only for OT-IIA3 Event
- PMS465/PEO ITF Accreditation received prior to accreditation package provided to COMOPTEVFOR
- HWIL Systems Accredited:
 - NAVSEA Dam Neck Multi-Function Land-Based Test Site
 - Surface Combat Systems Center V-10 ACS B/L 6phase1R
 - Eastville Tower (DDS relay tower)
 - NP-3C (DDS relay only plane)
 - NP-3D (CEC-equipped Hawkeye 2000 prototype)
- CEC/ITF Accreditation completed 90 days prior to event
- COMOPTEVFOR had follow-on questions requiring answers
- COMOPTEVFOR Accreditation completed week of event



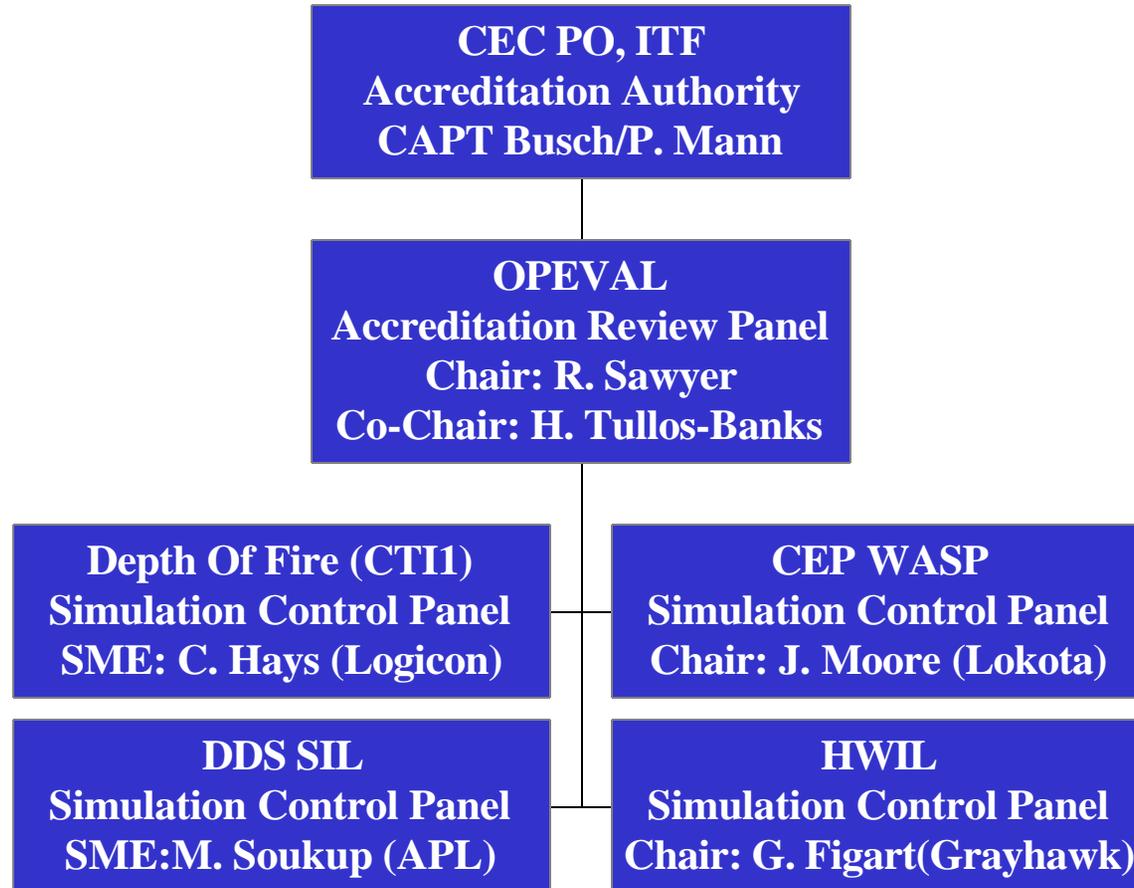
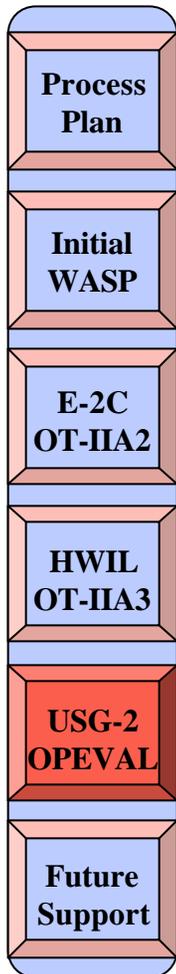
CEC USG-2 OPEVAL



- 6 accreditations required to support OPEVAL
 - HWIL Systems (2 LBTS, Tower, NP-3D plane)
 - CEP WASP re-accreditation with additional interfaces
 - DDS System Lab (Raytheon)
- 3 additional accreditations to support TECHEVAL
 - 2 AEGIS engineering simulations (FirmTrack, Workbench/EFCP)
 - 1 electromagnetic wave propagation model (TEMPER)
- Scheduled completion of all accreditation by 12/00
- Total of 38 VV&A documents to be generated over 11 months

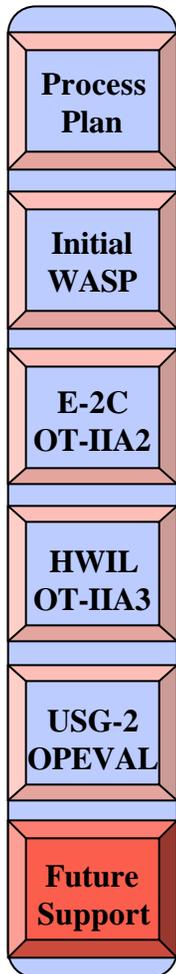


USG-2 OPEVAL Organization





Future Support Areas



- Continue to support CEC USG-2 OPEVAL into FY01
- Wrap-up USG-2 OPEVAL accreditation documentation
- Wrap-up USG-2 TECHEVAL accreditation documentation
- Begin VV&A planning for SSDS Mk 2 FOT&E support
- Begin VV&A planning for USG-2 FOT&E support
- Begin VV&A planning for USG-3 FOT&E support
- Continue to refine CEC VV&A process
- Support early involvement with CEC M&S developments



Summary



- CEC program office has established an effective M&S VV&A process
- Supports internal and external accreditations
- Focused on engineering M&S
- Provides tailorings for HWIL Systems and Operational Test
- Results of initial CEP WASP accreditation captured in VV&A document package and resides on CEC VV&A website



VV&A Process Sample Schedule



CEP WASP OVERALL VV&A SCHEDULE

