

**NRC TRAVEL TRIP REPORT**  
**Nuclear Procurement Issues Committee (NUPIC) observation at**  
**Curtiss-Wright Electro-Mechanical Corporation**

**Traveler, Office, Division, Phone Number:** Stacy Smith, Team Leader, Electrical Vendor Branch (CEVB), Division of Construction Inspection & Operational Programs (DCIP), (301) 415-1340; Samantha Crane, Reactor Operations Engineer, Mechanical Vendor Branch (CMVB), DCIP, (301) 415-6380.

**Subject:** Nuclear Regulatory Commission (NRC) observation of a Nuclear Procurement Issues Committee (NUPIC) audit at Curtiss-Wright Electro-Mechanical Corporation (EMD).

**Dates of Travel and Organizations Visited:** June 10-15, 2012/Curtiss-Wright EMD, Cheswick, PA.

**Desired Outcome:** To verify, by direct observation, the effectiveness of the independent oversight activities performed by NUPIC to qualify vendors in accordance with the requirements of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities."

**Results Achieved:** The NRC inspection team verified that NUPIC effectively implemented their audit process. The NRC inspection team noted that, while this process is currently effective to ensure NUPIC checklist completion, a stronger focus on the implementation of Appendix B may improve NUPIC's ability to evaluate vendor performance.

**Summary of Trip:** Curtiss-Wright EMD is a division of Curtiss-Wright Flow Control and located at 1000 Wright Way, Cheswick, PA 15024. Curtiss-Wright EMD is an American Society of Mechanical Engineers (ASME) certificate holder with multiple scopes of authorization, which include N, NPT, and NS. Its scope of supply includes, but is not limited to, design and manufacturing of safety-related pumps, valves, motors, seals, control rod drive mechanisms (CRDM), and providing qualification and testing services, and commercial grade dedication.

The NUPIC audit team consisted of seven audit members and one technical specialist. The objective of the NUPIC audit was to use the NUPIC audit checklist to determine the acceptability and verify the effective implementation of Curtiss-Wright EMD's quality assurance (QA) program in accordance with the requirements 10 CFR Part 50 Appendix B, ASME NQA-1-2008, "Quality Assurance Requirements for Nuclear Facility Applications," and 10 CFR Part 21. For the audit observation, the two NRC inspectors each selected a sample of the audit checklist review areas for verification. The NRC inspectors observed NUPIC's review and evaluation processes for the implementation of Curtiss-Wright EMD's QA program for ensuring design requirements, including ASME requirements, and associated design specifications were adequately incorporated into the qualification, engineering, and dedication processes. The NUPIC audit and audit checklist also addressed software QA.

Curtiss-Wright EMD provided its QA manual and other implementing procedures to the NUPIC audit team. The audit team reviewed the implementation of the requirements of 10 CFR 50, Appendix B in the QA program and supporting implementing procedures, evaluated the documentation associated with the activities that had been performed, and discussed the activities with Curtiss-Wright EMD personnel. NUPIC and the NRC also observed ongoing work

and inspection activities, including receipt inspections, welding, and performance testing of reactor coolant pumps for the AP1000.

The NUPIC audit team conducted daily team meetings to discuss observations and findings. The NRC inspectors observed these meetings to verify that the NUPIC audit team was adequately addressing issues and effectively verifying the implementation of QA requirements

The areas reviewed during the audit include the following: contract review, design, commercial-grade dedication, software QA, procurement, fabrication/assembly activities, material control and handling, storage and shipping, special processes, tests, inspection and calibration, document control/adequacy, organization/program, nonconforming items, 10 CFR Part 21, internal audit, corrective action, training/certification, field services, and, records.

At the exit meeting, the audit team presented seven potential findings to Curtiss-Wright EMD's management. The first finding was in the area of commercial-grade dedication. The audit team identified that Curtiss-Wright EMD was not consistently identifying and documenting activities affecting quality in commercial-grade surveys and failed to adequately describe the process and requirements for the development of dedication plans. The second finding was in the area of software QA. The audit team identified that Curtiss-Wright EMD failed to identify acceptance criteria when performing verification and validation to dedicate software and appropriately capture or disposition software errors. The third finding was in the area of procurement. The audit team identified that Curtiss-Wright EMD was inappropriately imposing 10 CFR Part 21 in purchase orders to commercial suppliers. The fourth finding was in the area of special processes. The audit team identified that Curtiss-Wright EMD was not welding in accordance with quality procedures. The fifth finding was in the area of measuring and test equipment (M&TE). The audit team identified that Curtiss-Wright EMD failed to record traceability to application for use for M&TE utilized in commercial grade dedication and receipt inspections. The sixth finding was in the area of document control. The audit team identified that Curtiss-Wright EMD used several uncontrolled work instructions and obsolete procedures. The seventh finding was in the area of records. The audit team identified that Curtiss-Wright EMD did not have a documented procedure to control electronic quality records.

The NRC inspectors observed all of the NUPIC audit team members perform in part, or in whole, their portion of the audit. The NUPIC audit team adequately addressed the specific areas of the checklist on which the NRC inspectors focused their review. The NRC inspectors reviewed the training and qualifications of the NUPIC audit team members and found that they were fully trained and qualified to conduct the audit. However, the NRC inspectors observed that additional training may aid the auditor's ability to ask appropriate follow-up questions to verify adequate implementation of the QA program. Specifically, the inspector identified implementation issues that were not identified by the auditor and through discussions were determined to be beyond the auditor's area of expertise. The inspectors concluded that this was an example of NUPIC performing a programmatic review without adequately verifying implementation.

With the exception of the audit findings identified above, the NUPIC audit team determined that Curtiss-Wright EMD was effectively implementing its QA program for the program elements that were audited. The audit team concluded that the findings had no impact on product quality. The NRC concluded that the NUPIC checklist was effectively implemented by the audit team; however, the NRC inspectors noted that compliance with the NUPIC checklist resulted in an audit that focused on program/process instead of performance based samples of the areas

covered. The rigidity and volume of checklist areas that need to be assessed challenge the audit team's ability to adequately verify the implementation of Appendix B.

**Pending Actions/Planned Next Steps for NRC:** The NRC will review the finalized NUPIC report and, if needed, address any new information that was not addressed in the audit exit meeting on Friday, June 15, 2012.

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**Distribution**

J Luehman  
S Crane  
R McIntyre  
K Kavanagh  
E Roach

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<b>OFFICE</b>	NRO/DCIP/CEVB	NRO/DCIP/CMVB	NRO/DCIP/CEVB
<b>NAME</b>	SSmith	SCrane	RRasmussen
<b>DATE</b>	06/26/2012	06/26/2012	06/27/2012

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