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Bob Hill
Department Manager - Nuclear Systems Analysis
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Subject: Completion of AFCI Level 4 Milestone (M4505051303), Work Package OR0915050513, Report describing quality assurance protocol, due 5/28/2009

Dear Sir;

The objective of this letter is to inform you of recent progress on the development of advanced structural materials in support of advanced fast reactors and AFCI. As you know, the alloy development effort has been initiated in recent months with the procurement of adequate quantities of the NF616 and HT-UPS alloys. As the test alloys become available in the coming days, mechanical testing, evaluation of optimizing treatments, and screening of environmental effects will be possible at a larger scale. It is therefore important to establish proper quality assurance protocols for this testing effort in a timely manner to ensure high technical quality throughout testing. A properly implemented quality assurance effort will also enable preliminary data taken in this effort to be qualified as NQA-1 during any subsequent licensing discussions for an advanced design or actual prototype. The objective of this report is to describe the quality assurance protocols that will be used for this effort.

An essential first step in evaluating quality protocols is assessing the end use of the data. Currently, the advanced structural materials effort is part of a long-range, basic research and development effort and not, as yet, involved in licensing discussions for a specific reactor design. After consultation with Mark Vance (an ORNL QA expert) and based on the recently-issued AFCI QA requirements, the application of NQA-1 quality requirements will follow the guidance provided in Part IV, Subpart 4.2 of the NQA-1 standard (Guidance on Graded Application of QA for Nuclear-Related Research and Development). This guidance mandates the application of sound scientific methodology and a robust peer review process in all phases, allowing for the data to be qualified for use even if the programmatic mission changes to include licensing discussions of a specific design or prototype. ORNL has previously implemented a QA program dedicated to GNEP activities and based on an appropriately graded application of NQA-1 requirements at the site. The current program is being revised to incorporate changes imposed through the recently revised AFCI Technical Integration Office QA requirements.

Testing conducted under the AFCI QA program for the advanced structural materials effort shall incorporate the following quality assurance expectations:

- personnel are adequately trained to perform assigned work.
- activities are controlled to ensure consistency of results.
- records necessary to substantiate how the work was performed are maintained (dedicated laboratory notebooks will be used)
- the pedigree and traceability of the various tested materials are maintained throughout the described processes using consistent sample numbering and adequate record keeping.
- equipment with the potential to affect the quality of the planned work is calibrated and maintained in accordance with applicable operating requirements.

In addition, all reporting or related dissemination by ORNL personnel of the results of the work described in this subcontract shall be conducted in accordance with the requirements described or referenced in the ORNL Standards Based Management System subject area entitled Scientific and Technical Information. Reporting or publications at other institutions will be conducted in accordance with the requirements of that institution.

Successful implementation of these protocols will provide a sound basis for future decisions and research. In addition, these steps will also help ensure that results can also be applied to licensing discussions at a future date.

If you have any comments or questions, please contact me. Thank you.

Sincerely,

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