Establishment of Remote Control High Temperature Mechanical Testing Facility in a Hot Cell at The University of New Mexico

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ABSTRACT:

The main objective of this project is to establish a high temperature mechanical testing capability within the hot cell of Nuclear Engineering (NE) Department at The University of New Mexico (UNM) that can be operated using the existing manipulators allowing remote operation for testing radioactive specimens that are >5mr/hr at 30 cm. Combined with the existing infrastructure, this capability will allow establishment of microstructure-mechanical property relations in structural materials for nuclear energy applications. The hot cell is already capable of handling radioactive specimens up to a total activity of 2.5 Ci (NRC BM233-108). With the addition of a tension test frame and a high temperature furnace that are specifically designed for radioactive specimens and remote handling with the manipulators, the lab will

1- enable research and development on structural materials for nuclear energy
2- educate and train next generation of nuclear scientists, engineers, and policy makers

The new capability will be an important enhancement to the existing teaching and research infrastructure at UNM. Although the proposed capabilities exist in national laboratories, they are rare and very limited in universities. Therefore, establishing such a laboratory will be a unique set up in a university environment in southwest and not only help attract high quality students but also significantly improve the capability to perform research on radioactive materials for nuclear energy. As a result, the proposed facility supports DOE NE's primary mission in advancing nuclear power capable of meeting the nation's energy needs.

In addition to significantly enhancing the R&D on nuclear materials, the proposed facility will also create unique education and training opportunities for the students in southwest. The facility will be utilized in the laboratory sections of both graduate and undergraduate level nuclear and other materials science and engineering courses. In addition to UNM, New Mexico Tech, and Navajo Tech, national laboratories will also have access to the equipment. Therefore, the proposed facility will enable the education and training of nuclear scientists, engineers, and policy-makers, in both graduate and undergraduate studies.