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Developing the Technical Basis for Long Term Storage and Subsequent Transportation of Used Nuclear Fuel

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ABSTRACT: The United States Department of Energy (DOE), Office of Nuclear Energy (NE) is engaged in a program to develop the technical bases for extending dry storage and subsequent transportation of used nuclear fuel. With the cancellation of the Yucca Mountain repository project, the DOE/NE is currently evaluating alternative fuel cycles, including alternative concepts to dispose of wastes produced by candidate fuel cycles. Since this evaluation is planned to take decades, the need to store these fuels past their regulatory certification periods has become clear. And, since development of the technical basis to extend certification storage periods will take multiple years, the time to start addressing the technical needs is now.

The NE program addressing this issue is divided into four main topical areas; R&D Opportunities, Security, Transportation, and Concept Evaluations. R&D Opportunities is focused on conducting a data gap analysis that will identify the technical issues that need to be addressed in order to demonstrate fuel integrity in a storage environment over long periods of time. Security will identify and address security issues that arise as a consequence of long term storage that may not be apparent over a much shorter period of time. Transportation is focused on technical issues associated with transport of fuel after extended storage, as well as transport of high burnup fuel in the near term. Concept Evaluations will roll up these three efforts and develop a process for evaluation of candidate alternatives that will be considered for gathering the needed data.

As part of the NE program, close collaboration with industry and international organizations is essential. This collaboration includes participation on the Electric Power Research Institute (EPRI) Extended Storage Collaboration Program (ESCP) Committee. This committee is charted to identify technical gaps and associated means to gather the necessary data. In addition, ESCP has a subcommittee that is focused on international participation in order to get the broadest input from across the world on issues concerning long term storage and transportation of used fuel. It is expected that significant leverage can be attained by combining efforts on similar issues from organization across the world.

This paper will provide an overview of the NE program, a status of the work performed to date, and a vision of future work

KEYWORDS: *Used fuel, long term storage, transportation, security, Department of Energy*

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