

MAR11-2010-001816

Abstract for an Invited Paper  
for the MAR11 Meeting of  
the American Physical Society

**Used Nuclear Fuel: From Liability to Benefit**

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Nuclear power has proven safe and reliable, with operating efficiencies in the U.S. exceeding 90%. It provides a carbon-free source of electricity (with about a 10% penalty arising from CO<sub>2</sub> released from construction and the fuel cycle). However, used fuel from nuclear reactors is highly toxic and presents a challenge for permanent disposal – both from technical and policy perspectives. The half-life of the “bad actors” is relatively short (of the order of decades) while the very long lived isotopes are relatively benign. At present, spent fuel is stored on-site in cooling ponds. Once the used fuel pools are full, the fuel is moved to dry cask storage on-site. Though the local storage is capable of handling used fuel safely and securely for many decades, the law requires DOE to assume responsibility for the used fuel and remove it from reactor sites. The nuclear industry pays a tithe to support sequestration of used fuel (but not research). However, there is currently no national policy in place to deal with the permanent disposal of nuclear fuel. This administration is opposed to underground storage at Yucca Mountain. There is no national policy for interim storage—removal of spent fuel from reactor sites and storage at a central location. And there is no national policy for liberating the energy contained in used fuel through recycling (separating out the fissionable components for subsequent use as nuclear fuel). A “Blue Ribbon Commission” has been formed to consider alternatives, but will not report until 2012. This paper will examine alternatives for used fuel disposition, their drawbacks (e.g. proliferation issues arising from recycling), and their benefits. For recycle options to emerge as a viable technology, research is required to develop cost effective methods for treating used nuclear fuel, with attention to policy as well as technical issues.