

NEF11-2011-020007

Abstract for an Invited Paper
for the NEF11 Meeting of
the American Physical Society

The Fundamentals and Status of Nuclear Power

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Nuclear power has enormous potential to provide clean, safe base-load electricity to the world's growing population. Harnessing this potential in an economic and responsible manner is not without challenges. Safety remains the principal tenet of our operating fleet, which currently provides ~20% of U.S. electricity generated. The performance of this fleet from economic and safety standpoints has improved dramatically over the past several decades. This nuclear generation also represents greater than 70% of the emission free electricity with hydroelectric power providing the majority of the remainder. There have been many lessons learned from the more than 50 years of experience with nuclear power and these have been factored into the new designs now being constructed worldwide. These new designs, which have enhanced safety compared to the operating fleet, have been simplified by employing passive safety systems and modular construction. There are applications for licenses of more than 20 new reactors under review by the U.S. Nuclear Regulatory Commission; the first of these licenses will be completed in early 2012, and the first new U.S. reactor will start operating in 2016. Yet there are still more improvements that can be made and these are being pursued to achieve an even greater deployment of nuclear power technology.