

REPORT: OVER THREE DOZEN U.S. NUCLEAR REACTORS AT RISK OF EARLY RETIREMENT, 12 FACE GREATEST SHUTDOWN PRESSURE

In Wake of San Onofre, Crystal River & Keweenaw Shutdowns, Cooper Outlines Next Nuclear Reactors Under the Greatest Pressure to Close Down; Reactors in AL CA, CT, FL, IL, IA, KS, MD, MA, MI, MN, MO, NE, NH, NJ, NY, OH, PA, SC, TN, TX, VT, and WI on "At Risk" List.

WASHINGTON, D.C.//NEWS ADVISORY//The tough times the U.S. nuclear power industry faces today are only going to get worse. In the wake of nine major nuclear reactor closures or uprate cancellations in recent months, a review of the remaining U.S. fleet reveals that 38 reactors in 23 states are at risk of early retirement, with 12 facing the greatest risk of being shutdown, according to a major new analysis by Mark Cooper, senior fellow for economic analysis, Institute for Energy and the Environment, Vermont Law School.

Cooper is the author of several reports on nuclear power, including "*Policy Challenges of Nuclear Reactor Construction, Cost Escalation and Crowding Out Alternatives*" (2009).

Available online at <http://216.30.191.148/atriskreactors.html> and titled, "*Renaissance in Reverse: Competition Pushes Aging U.S. Nuclear Reactors to the Brink of Economic Abandonment*," the new Cooper report looks beyond the recent shutdown of four reactors – San Onofre (2 reactors) in California, Keweenaw in Wisconsin, and Crystal River in Florida – and the death of five large planned “uprate” expansion projects – Prairie Island in Minnesota, LaSalle (2 reactors) in Illinois, and Limerick (2 reactors) in Pennsylvania.

Using 11 risk factors -- including competition from lower-cost energy sources, falling demand, safety retrofit expenses, costly repairs, and rising operating costs – identified in three different Wall Street analysis reports from Moody's, UBS, and Credit Suisse, the Cooper report finds:

- 38 reactors in 23 states exhibited four or more of the 11 risk factors. The 23 states with at-risk nuclear reactors are: Alabama (Browns Ferry); California (Diablo Canyon); Connecticut (Millstone); Florida (Turkey Point); Illinois (Clinton, Dresden, LaSalle, and Quad Cities); Iowa (Duane Arnold); Kansas (Wolf Creek); Maryland (Calvert Cliff); Massachusetts (Pilgrim); Michigan (Cook, Fermi, and Palisades); Minnesota (Monticello and Prairie Island); Missouri (Callaway); Nebraska (Cooper and Ft. Calhoun); New Hampshire (Seabrook); New Jersey (Hope Creek and Oyster Creek); New York (Fitzpatrick, Ginna, Indian Point, and Nine Mile Point); Ohio (Davis-Besse and Perry); Pennsylvania (Limerick, Susquehanna, and Three Mile Island); South Carolina (Robinson); Tennessee (Sequoyah); Texas (Comanche Peak and South Texas); Vermont (Vt. Yankee); and Wisconsin (Point Beach).
- Of the overall at-risk group, 12 reactors (in alphabetical order) were found to be at greatest risk of early retirement: Clinton (selling into a tough market); Davis-Besse (large number of risk factors); Fitzpatrick (high cost but offset by high market clearing price); Ft. Calhoun (outage, poor performance); Ginna (single unit with negative margin, existing contract); Indian Point (license extension, state opposition); Millstone (tax issues); Nine Mile Point (site size saves it, existing contract); Oyster Creek (already set to retire early); Palisades (repair impending, local opposition) Pilgrim (large number of risk factors, local opposition); and Vt. Yankee (tax issue and state opposition).

Commenting on the report, Mark Cooper said: “Recent developments have sent what are truly shock waves through the industry and Wall Street. The spate of early retirements and decisions to forego uprates magnify the importance of the fact that the ‘nuclear renaissance’ has failed to produce a new fleet of reactors in the U.S. With little chance that the cost of new reactors will become competitive with low carbon alternatives in the time frame relevant for old reactor retirement decisions, we need to start preparing now for more early retirements or the threats of

such retirements. By explaining the underlying economic causes of the growing wave of early retirements, the policymakers will be better equipped to make economically rational responses.”

Peter A. Bradford, adjunct professor at the Vermont Law School, a former member of the U.S. Nuclear Regulatory Commission (NRC), and a former utility commission chair in New York and Maine, said: “**No U.S. nuclear plant has ever closed because it reached the end of its licensed life. Instead, cost challenges to their continued profitability has usually been the cause of shutdowns. Dr. Cooper's new work shows this to be a widespread and an enduring problem, one that further undermines nuclear power's claim to being a promising bulwark in a serious climate policy.”**

With a large number of reactors poised on the razor's edge of economic abandonment, the chances are high that any one of a number of the key factors – significant repair costs, retrofits to improve safety, stiff competition from lower-cost energy alternatives, rising costs of operation – will push the owners to retire the reactors early for economic reasons. As Cooper points out, the same factors call into question the economic efficacy of license extensions and reactor uprates.

The Cooper paper also shows:

- The economic situation for nuclear has always been bad and is unlikely to change. The poor performance of nuclear reactors that is resulting in early retirements today has existed throughout the history of the commercial nuclear sector in the U.S. The problems are endemic to the technology and the sector. The that the key underlying economic factors -- rising costs of an aging fleet and the availability of lower cost alternatives -- are likely to persist over the next couple of decades, which is the relevant time frame for making decisions about the fate of aging reactors.
- It is not only old, broken reactors that are at risk of retirement. As old reactors become more expensive to operate, they may become uneconomic to keep online in the current market conditions. Indeed, the first reactor retired in 2013 (Keweenaw) was online and had just had its license extended for 20 years, but its owners concluded it could not compete and would yield losses in the electricity market of the next two decades, so they chose to decommission it.
- The industry continues to have great difficulty executing major capital improvements and repairs. Crystal River and San Onofre were abandoned after repairs went very badly. The experience with major uprates since 2009 exhibits exactly the same problems that have plagued nuclear construction projects throughout the history of the commercial sector -- abandonments, cancellation and large cost overruns.
- Things have gotten so bad in the aging nuclear fleet in the U.S. that Wall Street analysts are now issuing reports with titles such as the following: “*Nuclear... the Middle Age Dilemma? Facing Declining Performance, Higher Costs and Inevitable Mortality,*” (Credit Suisse); “*Some Merchant Nuclear Reactors Could Face Early Retirement: UBS*”; and “*Low Gas Prices and Weak Demand are Masking US Nuclear Plant Reliability Issues*” (Moody's).

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EDITOR'S NOTE: A streaming audio replay of a related news event will be available as of 6 p.m. EDT on July 17, 2013 at <http://216.30.191.148/atriskreactors.html>.