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General Comment

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Nuclear license renewal comments by WLT

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UNITED STATES OF AMERICA
BEFORE THE NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF:)	
)	Docket ID NRC-2015-0251
STANDARD REVIEW PLAN FOR)	
REVIEW OF SUBSEQUENT LICENSE)	Report NUREG-2191, V. 2
RENEWAL APPLICATIONS FOR)	
NUCLEAR POWER PLANTS)	COMMENTS OF WALLACE TAYLOR

The following comments are submitted by Wallace L. Taylor on the Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants. I live within 10 miles of the Duane Arnold Energy Center, which is located near Palo. Iowa. I am concerned that subsequent relicensing of this plant will pose a danger to me and to others living near the plant. This danger arises from the safety aspect of the plant itself and also the likelihood that the radioactive spent fuel will be stored at the plant site indefinitely. In addition, reliance on nuclear power unjustifiably delays the beneficial transition to clean and renewable energy sources.

At issue here is a plan to issue subsequent license renewals that would allow nuclear reactors that were designed for 40 years of operation to operate for a total of 80 years. This certainly would be pushing the envelope in terms of safety. Extended operation would also produce more radioactive spent fuel for which there is no solution regarding its disposal.

Regulatory Background on License Renewals

When the United States began licensing nuclear reactors in the late 1960's and early 1970's, the reactors were designed to operate for 40 years. The NRC, in a fact sheet published by the agency, admits that "because of this selected time period, some systems, structures, and components may have been engineered on the basis of an expected 40-year service life." So the reactors were not designed for any license renewal, let alone a subsequent license renewal.

An investigation by the Associated Press reported as follows:

When commercial nuclear power was getting its start in the 1960s and 1970s, industry and regulators stated unequivocally that reactors were designed only to operate for 40 years. Now they tell another story - insisting that the units were built with no inherent life span, and can run for up to a century.

By rewriting history, plant owners are making it easier to extend the lives of dozens of reactors in a relicensing process that resembles nothing more than an elaborate rubber stamp.

[T]he relicensing process often lacks fully independent safety reviews. Records show that paperwork of the U.S. Nuclear Regulatory Commission sometimes matches word-for-word the language used in a plant operator's application.

Also, the relicensing process relies heavily on such paperwork, with very little onsite inspection and verification.

And under relicensing rules, tighter standards are not required to compensate for decades of wear and tear.

The record also shows that a design limitation on operating life was an accepted truism.

In 1982, D. Clark Gibbs, chairman of the licensing and safety committee of an early industry group, wrote to the NRC that "most nuclear power plants, including those operating, under construction or planned for the future, are designed for a duty cycle which corresponds to a 40-year life."

And three years later, when Illinois Power Co. sought a license for its Clinton station, utility official D.W. Wilson told the NRC on behalf of his company's nuclear licensing department that "all safety margins were established with the understanding of the limitations that are imposed by a 40-year design life.

License renewals are authorized by 10 C.F.R. Part 54. And 10 C.F.R. § 54.31(d) states that a renewed license may be subsequently renewed "in accordance with all applicable requirements." No basis is given on which a subsequent renewal can justifiably be issued. This is especially

troubling in light of the fact that the reactors have been designed to operate for only 40 years.

In a January 31, 2014, memo to the Commission (SECY-14-0016), NRC staff recommended to the Commission that a rulemaking process be initiated to update the regulatory framework regarding subsequent license renewals. The staff memo noted that the current rule allows a previously renewed license to be subsequently renewed with no additional requirements imposed and no limit to the number of times a license can be subsequently renewed.

The NRC staff's recommendation for updating the subsequent relicensing rule included the following:

- Adding the requirements in 10 C.F.R. § 50.61a regarding fracture toughness requirements for protection against pressurized thermal shock events;
- Clarifying the additional record keeping requirements that would apply to newly identified systems, structures, and components posing a safety risk;
- Requiring a licensee to implement aging-management activities before the expiration of its current license;
- Identifying any equipment required by the licensee to comply with the strategies adopted in response to the Fukushima Dai-ichi incident;
- More explicitly requiring the maintenance of the effectiveness of aging-management activities; and
- Defining the timing of subsequent license renewal applications.

In response to the staff memo, the Commission summarily rejected the staff's recommendations and refused to adopt them. Although I believe that there should be no reactor license renewals, especially subsequent license renewals, the Commission should at least adopt the recommendations of its own staff. This seems obvious in response to proposals to extend operating licenses 40 years beyond the designed life of the reactors.

Safety Issues Related to Subsequent License Renewal

Because the fleet of nuclear reactors was designed to operate for only 40 years there are obviously safety issues with extending the operating life for double that time period. Systems, structures and components wear out. For many of these failures there is no adequate repair or replacement. Because of that, the NRC and the nuclear industry have devised an alternative strategy, as explained in the Associated Press investigation referred to above:

Federal regulators have been working closely with the nuclear power industry to keep the nation's aging reactors operating within safety standards by repeatedly weakening those standards, or simply failing to enforce them.

Time after time, officials at the U.S. Nuclear Regulatory Commission have decided that original regulations were too strict, arguing that safety margins could be eased without peril, according to records and interviews.

Examples abound. When valves leaked, more leakage was allowed - up to 20 times the original limit. When rampant cracking caused radioactive leaks from steam generator tubing, an easier test of the tubes was devised, so plants could meet standards.

Records show a recurring pattern: Reactor parts or systems fall out of compliance with the rules. Studies are conducted by the industry and government, and all agree that existing standards are "unreasonably conservative."

Regulations are loosened, and the reactors are back in compliance.

That is the context in which the Commission is now determining the standards for subsequent license renewals. It does not appear from a review of the Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants that there are any additional requirements than what already exist for initial license renewals. Given the history of initial license renewals, that is a troubling issue. Some examples will illustrate the problem.

The North Anna and Brunswick reactors were relicensed in 2003 and 2006, respectively. By 2009 it was discovered that at both reactor sites, steel containment liners had corroded and rusted through, exposing the public to radiation releases from the reactors.

Likewise, in 2009, a one-third-inch hole was discovered in a liner at the Beaver Valley reactor. Nonetheless, its license was renewed in November of that year.

In the summer of 2001, the NRC was confronted with the problem of corrosive chemicals cracking nozzles on reactors. But the NRC let operators delay inspections to coincide with scheduled outages. Inspection finally took place in February of 2002 at the Davis-Besse reactor. They discovered extensive cracking and a place where acidic boron had spurted from the reactor and eaten a gouge as big as a football. When the problem was found, just a fraction of an inch of inner lining remained. An NRC analysis determined that the vessel head could have burst within two months, a near rupture that could have released large amounts of radiation into the environment. Then, in 2010, Davis-Besse workers again found dried boron on the nozzles of a replacement vessel head, indicating more leaks. Even so, unsurprisingly, the Davis-Besse license was renewed in December of 2015.

The Fort Calhoun reactor in Nebraska obtained a renewed license in 2003. After the plant was flooded by water from the Missouri River and the plant was inspected after the flood waters receded, numerous structural and operational deficiencies were found. These deficiencies dated back to the 1990's. But they were obviously overlooked at the time of relicensing. The problems with the plant were so bad that Fort Calhoun was under 0350 oversight for over 3 years.

The fact that none of these scenarios resulted in an actual safety breach does not mean that the NRC procedures are adequate to protect the public. It means that we are lucky there has been regulation by guardian angel.

In general, the current inability to inspect and adequately maintain critical aging structures and components means any current aging management plan is inadequate. Until those issues are resolved it is premature to consider subsequent relicensing any nuclear reactors.

Based on this sorry history of relicensing in spite of known or discoverable safety risks at reactors whose licenses have already been renewed, I have no confidence that the NRC's proposal to issue subsequent license renewals will adequately protect the public.

Another problem with relicensing procedures is the distinct effort by the NRC to limit public involvement in the process. Intervention in the relicensing process must be requested within 60 days of the application being filed; there are very strict requirements on the contentions that may be filed, and they are interpreted by the Commission in such a way to make it extremely difficult for members of the public with few resources to participate; and as noted in the Associated Press investigation discussed above, the relicensing procedure is basically a rubber stamp. The Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants does nothing to address that situation.

The NRC's proposal for subsequent renewal of licenses must be rejected.

The Issue of Radioactive Spent Fuel

Aside from the safety issues, subsequent license renewal also poses a danger regarding the disposal of radioactive spent fuel. If licenses are renewed for an additional 20 years that means 20 more years of spent fuel for which there is no adequate disposal.

The NRC has issued what it calls its Continued Storage Spent Fuel Rule. The essence of this rule is that spent fuel can be stored at the reactor sites indefinitely, even if no permanent repository is ever found. This rule was promulgated in response to the court's decision in New York v. NRC, 681 F.3d 471 (D.C. Cir. 2012). The court in that case described the situation as follows:

After four to six years of use in a reactor, nuclear fuel rods can no longer efficiently produce energy and are considered "spent nuclear fuel" ("SNF"). Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy 10-11 (2012). Fuel rods are thermally hot when removed from reactors and emit great amounts of radiation - enough to be fatal in minutes to someone in the immediate vicinity. Id. Therefore, the rods are transferred to racks within

deep, water-filled pools for cooling and to protect workers from radiation. After the fuel has cooled, it may be transferred to dry storage, which consists of large concrete and steel "casks." Most SNF, however, will remain in spent-fuel pools until a permanent disposal solution is available. Id. at 11.

Even though it is no longer useful for nuclear power, SNF poses a dangerous, long-term health and environmental risk. It will remain dangerous "for time spans seemingly beyond human comprehension." Nuclear Energy Inst., Inc. v. EPA, 373 F.3d 1251, 1258 (D.C. Cir. 2004) (per curiam). Determining how to dispose of the growing volume of SNF, which may reach 150,000 metric tons by the year 2050, is a serious problem. See, Blue Ribbon Commission, *supra*, at 14.

The delay [in finding a permanent repository] has required plants to expand storage pools and to pack SNF more densely within them. The lack of progress on a permanent repository has caused considerable uncertainty regarding the environmental effects of temporary SNF storage and the reasonableness of continuing to license and relicense nuclear reactors. (emphasis added).

The Continued Storage Rule essentially ignores the danger of spent fuel and in the promulgation of the rule the NRC made no attempt to examine the alternative of discontinuing the licensing and relicensing of nuclear reactors. The Rule is currently being challenged in the United States Court of Appeals for the District of Columbia Circuit.

The ultimate conclusion is that it makes absolutely no sense to relicense nuclear reactors and produce more radioactive waste when there is no possibility of finding a permanent repository in sight.

Renewable Energy and Energy Efficiency Preclude the Alleged Need for Subsequent Relicensing of Nuclear Reactors

The NRC must balance the risks of subsequent relicensing with the question of whether subsequent relicensing is actually needed. The currently renewed licenses will not expire until at least 2029. So the subsequently renewed licenses would not begin until that time and would extend

to 2049 and beyond. By that time, renewable energy and energy efficiency will have overtaken fossil fuels and nuclear power. The risks are not worth the NRC's attempt to give extended life to a dying industry.

Numerous studies have shown that we can generate all the energy we need from renewable sources with a comprehensive transmission and distribution grid if we will adopt policies supporting that vision. See, e.g., Archer and Jacobson, Supplying Baseload Power and Reducing Transmission Requirements by Interconnecting Wind Farms, *Journal of Applied Meteorology and Climatology* (v. 46, Nov. 2007); Jacobson and Delucchi, Providing All Global Energy with Wind, Water, and Solar Power, Part I: Technologies, Energy Resources, Quantities and Areas of Infrastructure, and Materials, *Energy Policy* (v. 39, p. 1154-1169); Jacobson and Delucchi, Providing All Global Energy with Wind, Water, and Solar Power, Part II: Reliability, System and Transmission Costs, and Policies, *Energy Policy* (v. 39, p. 1170-1190; Jacobson and Archer, Saturation Wind Power Potential and Its Implications for Wind Energy, found at www.pnas.org/cgi/doi/10.1073/pnas.1208993109. See also, The Energy Report: 100% Renewable Energy by 2050, prepared for the World Wildlife Fund by Ecofys and found at www.worldwildlife.org/climate/energy-report.html; Big Risks, Better Alternatives, prepared for Union of Concerned Scientists by Synapse Energy Economics, Inc. and found at www.ucsusa.org/assets/documents/nuclear_power/Big-Risks-Better-Alternatives.pdf. Another important source is Arjun Makhijani, Carbon-Free and Nuclear-Free: A Roadmap For U.S. Energy Policy (2007), available for download at www.ieer/carbon-free/.

The electric utilities and energy companies assert that in order to provide baseload power they have to use coal, natural gas or nuclear energy. But baseload as viewed by the utilities and power companies is an outdated concept. They are stuck with the narrow view of electric power coming from power plants. But rather than referring to the term baseload we are really talking about energy and capacity. Energy is the total amount of electricity that is being supplied to consumers. Capacity is the highest level of electricity that can be supplied at any one time to meet peak demand.

Renewable energy can meet the energy and capacity demands of the country, combined with a program of energy

efficiency and conservation and expansion of the transmission grid. Most states have energy efficiency programs subject to public utility regulation. Likewise, many states have renewable electricity standards requiring that a certain amount of the energy consumed in the state be from renewable sources. There are other policies, including feed-in tariffs, tax credits, loan programs, etc., that should be adopted to encourage the expansion of renewable energy. These efforts would lead us to a renewable energy future and away from the production of more radioactive nuclear waste.

The other important policy needed to support renewable energy is expansion of the transmission grid. We have heard the comment that since adequate transmission is not available right now we need to continue to expand the use of nuclear energy. That comment is incorrect for two reasons. First, expanded transmission is occurring right now. The Federal Energy Regulatory Commission (FERC) has over the past few years adopted policies to promote expansion of transmission lines. The most recent FERC action is Order 1000 adopted on July 21, 2011. And every area of the country has a regional transmission organization (RTO) that promotes and coordinates expanded transmission in each respective region. In the Midwest, for example, the Midwest RTO (MISO) has approved a number of transmission expansion projects designed to accommodate increased renewable energy production and they are ready for regulatory approval, and some are already being built. New transmission could begin to be constructed within a year or two, long before we would gain any alleged benefit from subsequent relicensing of nuclear reactors. We would be stuck with many more years of radioactive waste that could be avoided with the right policies supporting renewable energy.

Conclusion

The NRC has a duty to protect the public and the environment. For all of the reasons stated above, the proposal for subsequent relicensing of nuclear reactors violates that duty. Therefore, the NRC should abandon this proposal.

/s/ *Wallace L. Taylor*

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