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Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses

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Standard Format and Content for Applications To Renew Nuclear Power Plant Operating Licenses

Document: NRC-2019-0181-DRAFT-0001

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General Comment

Please consider my comments, regarding the NRCs draft Regulatory Guide (DG-1341), which are submitted in response to the NRCs call for public comments, as published in the Federal Register (Vol. 84, No. 180, page 48953), on September 17, 2019. The comments pertain to Docket ID NRC-2019-0181.

My comments are uploaded to this website.

Attachments

DG1341-comments

Please consider my comments, regarding the NRC's draft Regulatory Guide (DG-1341), which are submitted in response to the NRC's call for public comments, as published in the Federal Register (Vol. 84, No. 180, page 48953), on September 17, 2019. The comments pertain to Docket ID NRC-2019-0181.

(1) On February 25, 2014, the Nuclear Energy Institute (NEI) held a forum [1] in Washington, to discuss the prospect of subsequent license renewals (SLRs) that would allow plants to operate for a total lifetime of 80 years. Jennifer Uhle, the NRC's deputy director for reactor safety programs, stated that the agency staff plans to update its regulatory guidance on conducting license renewal reviews to prepare for SLR applications. It appears that DG-1341 is a draft that update. Dr. Uhle also, "identified several potential aging effects on reactor pressure vessels, piping, cables and plant concrete structures that NRC review guidance must consider and industry should address in its applications. 'We won't allow subsequent license renewal unless we're assured the plants are safe to operate in the extended period.'" She also pressed industry to address those issues. She said that the NRC staff "is not going to be able to resolve these issues, nor is it our role."

Douglas Walters, vice president for regulatory affairs at NEI, did not agree that all of Dr. Uhle's potential aging effects needed to be resolved during the NRC's SLR reviews. Walters said, "Not everything you need to do for long-term operation is a part of the regulatory process. ... I don't agree [finding solutions for each aging effect in advance] should be a requirement of getting a new license."

In the 5-1/2 years that followed the NEI's forum, NEI submitted NEI 17-01 [2], the NRC endorsed it [3], NEI revised it, and submitted it in its endorsed version [4], and Dr. Uhle moved from the NRC to the NEI. NEI also requested an exemption for the NRC's review and endorsement fees. [5]

It seems that the NEI is leading the NRC in establishing the criteria for review and approval of SLRAs. Who is the regulator of commercial nuclear power in the US, the NRC or the NEI?

Section 1.5 of NEI 17-01 lists four approaches to resolve open safety issues, the first of which is, "If resolution has been achieved before issuance of a renewed license, implementation of that resolution could be incorporated within the SLRA. The plant-specific implementation information should be provided."

This implies that a renewed license could be issued without resolution of all the applicable open safety issues. What are the potential aging issues that would not be resolved during the SLR reviews?

(2) Note Walter's choice of words. He said "new license", not "renewed license." I believe he was correct.

10 CFR §50.51, "Continuation of license" states that, "Each license will be issued for a fixed period of time to be specified in the license but in no case to exceed 40 years from date of issuance. ... Renewal of operating licenses for nuclear power plants is governed by 10 CFR part 54."

Renewal of operating licenses for nuclear power plants, according to 10 CFR §54, would not be license extensions, by amendment. They would be new licenses that expire in 20 years. If these operating licenses were to be renewed, under 10 CFR §50, then they would be license amendments that authorize extending operations by 20 years, provided that licensees implement acceptable aging management programs. So, a plant's lifetime, operating under a new license (10 CFR §54) is only 20 years. A plant's

lifetime, operating under a renewed license (10 CFR §50) is 60 years. (After an SLR, that would be 80 years.) It is confusing to see new licenses labelled “renewed” licenses.

(3) When a plant nears its 40 year design lifetime, it can be authorized to operate for an additional 20 years via 10 CFR §54 “renewal” process; but this is a new license, not a license amendment. If the plant’s operators were to apply for an extended license expiration date, under the license amendment provisions of 10 CFR §50, then the operators (or licensees) would have to file a “No Significant Hazards” statement, as specified by 10 CFR § 50.92, “Issuance of amendment”. Among other things, the “No Significant Hazards” statement would provide assurance that the proposed license amendment (e.g., a license extension), would not pose a significant hazard if, “operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability of an accident previously evaluated.”

(4) If the “renewal” were to be effected as an amendment to the original 10 CFR §50 license, then it would be very difficult, maybe impossible, to show that the amendment “would not involve a significant increase in the probability of an accident previously evaluated.” The licensing bases of all nuclear plants include analyses or evaluations (found in FSARs; usually in Chapter 15), of various postulated events that are grouped into categories, each of which is defined by a range of the expected frequencies of occurrence of its events, and a specification of analysis acceptance criteria. One category, Condition II or “infrequent incidents”, is defined as those incidents or events that, “may occur during the life of the particular plant”. So, an infrequent incident would not occur more than once in 40 years. A single infrequent incident that is not handled correctly, by the plant’s automatic reactor protection systems, or by its operators, could easily end the plant’s operating lifetime. This is what happened at Three Mile Island, in 1979. (That plant had been in operation for only about a year.)

If a new license expiration date lengthens the operating lifetime from 40 years to 60 years, then that would significantly increase (e.g., by 50%) the expected frequency of occurrence of “infrequent incidents” previously evaluated. An important principle of license renewal holds that the plant-specific licensing basis must be maintained during the renewal term in the same manner and to the same extent as during the original licensing term. Therefore, in order to maintain the expected frequency of occurrence of “infrequent incidents” at the same value, including the “renewed” term, it is necessary to make an improvement in plant design and/or operations. The average expected frequency of occurrence of “infrequent incidents” must become once in 60 years. After an SLR, it must be halved, to once in 80 years.

What is the improvement in plant design and/or operations that is planned, by the licensees, to maintain their plant-specific licensing bases to include their respective renewal terms?

(5) The first license “renewal”, effected under 10 CFR §54, might not be subject to 10 CFR §50.92, since it would be a new license. However, the SLR would certainly be subject to 10 CFR §50.92, since that would be an amendment to the new, extended license. Consequently, the SLR should entail some improvement in a plant’s design and/or operation to maintain the current licensing basis (CLB), particularly with respect to that plant’s expected frequency of occurrence of “infrequent incidents”. (The CLB includes the NRC regulations contained in 10 CFR parts 2, 19, 20, 21, 26, 30, 40, 50, 51, 54, 55, 70, 72, 73, 100 and the plant specific design-basis information defined in 10 CFR 50.2 as documented in the most recent FSAR.)

(6) 10 CFR §54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants”, governs the issuance of renewed operating licenses. So, the issuance of renewed operating license is a new license. Would it not be simpler, and less confusing, to issue a license amendment, under 10 CFR §50, which would extend the license expiration date, and record a license commitment (or condition) to establish and implement an acceptable aging management program? Power upratings are authorized by license amendments to licenses issued under 10 CFR §50. Why not license extensions, too?

(7) Probabilistic risk assessment (PRA) arguments cannot be used to dismiss the occurrence of three infrequent incidents, as highly unlikely. This is because 10 CFR §54 requires that plants maintain their current, deterministic licensing bases during the extended terms of operation that are authorized by their “renewed” licenses. This is supported by the Statement of Consideration, “The Commission reaffirms its previous conclusion (see 56 FR 64943 - 64956) that PRA techniques are most valuable when they focus the traditional, deterministic-based regulations and support the defense-in depth philosophy. In this regard, PRA methods and techniques would focus regulations and programs on those items most important to safety by eliminating unnecessary conservatism or by supporting additional regulatory requirements. PRA insights would be used to more clearly define a proper safety focus, which may be narrower or may be broader. In any case, PRA will not be used to justify poor performance in aging management or to reduce regulatory or programmatic requirements to the extent that the implementation of the regulation or program is no longer adequate to credit for monitoring or identifying the effects of aging.” --- FR 22468, Vol. 60, No. 88 (May 8, 1995)

(8) Aging management programs are focused upon reactor plant systems and components; but they should also account for offsite supporting systems like, for example, emergency power supplies, and cooling water sources. For Peach Bottom, for example, both are found in the Susquehanna River. Exelon Generation Company, LLC (Exelon), applied to the NRC on July 10, 2018 for an SLR for Peach Bottom Units 2 and 3. These reactors, both of which were connected to the grid in 1974, are General Electric MK1 BWRs that could operate until 2053 and 2054. They’re also connected (directly) to the Conowingo Dam, for emergency power. The dam, which was completed in 1928, is now plagued with sediment problems. Its FERC license expired on September 1, 2014. Exelon’s license renewal application (for the next 50 years, until 2054) is contested. Therefore, Conowingo Dam is currently operating without a license. By 2054, if licensed, Conowingo Dam would be 126 years old, and the Peach Bottom reactors would be 80 years old. Peach Bottom is offered herein as only one example. What provisions are contained in DG-1341 to account for issues like these? Would they be addressed in either the SLR safety evaluations or the environmental impact statements?

References

[1] S&P Global Platts, “US NRC expects application to extend nuclear licenses beyond 60 years”, Steven Dolley, 26 Feb 2014, <https://www.platts.com/latest-news/electric-power/washington/us-nrc-expects-application-to-extend-nuclear-21273628>

[2] Letter from Jerud E. Hanson, NEI to George A. Wilson, Jr., NRC, “Endorsement of NEI 17-01, Industry Guidance for Implementing the Requirements of 10 CFR Part 54 for Subsequent License Renewal, Revision 0”, March 8, 2017 (ADAMS No. ML17081A238)

[3] Letter from Jerud E. Hanson, NEI to George A. Wilson, Jr., NRC, "Endorsement of NEI 17-01, Industry Guidance for Implementing the Requirements of 10 CFR Part 54 for Subsequent License Renewal, Revision 0", December 5, 2017 (ADAMS No. ML17339A596)

[4] NEI 17-01, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 for Subsequent License Renewal," Washington, DC, December 2017 (ADAMS No. ML17339A599)

[5] Letter from Jerud E. Hanson, NEI to Maureen E. Wylie, NRC, "Fee Exemption Request for Activities Performed for Review and Endorsement of NEI 17-01, Industry Guidance for Implementing the Requirements of 10 CFR Part 54 for Subsequent License Renewal, Revision 0", April 7, 2017 (ADAMS No. ML17101A424)