



UNITED STATES  
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June 15, 2020

MEMORANDUM TO: Shaun M. Anderson, Co-Founder  
EMBARK Venture Studio  
Office of Nuclear Reactor Regulation

FROM: Lauren K. Gibson, Program Manager /RA/  
License Renewal Projects Branch  
Division of New and Renewed Licensees  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF MAY 27, 2020, PUBLIC MEETING ON THE USE OF  
FORMAL RISK INSIGHTS IN LICENSE RENEWAL (EMBARK  
VENTURE STUDIO)

On May 27, 2020, the U.S. Nuclear Regulatory Commission (NRC) held a Category 2 public meeting to discuss potential uses of formal risk insights in license renewal. This meeting was the fourth meeting of the day that involved EMBARK Venture Studio activities. The NRC and industry discussed ideas for incorporating formal risk insights into license renewal, including Aging Management Programs (AMP) implementation, applications and reviews. The discussion focused on using risk information in the implementation of AMP. Then, in order to gauge interest and feasibility, NRC and the industry discussed 1) how risk categorization information from 50.69, "Risk categorization of structures, systems, and components," may be used broadly in a license renewal application (first or subsequent) and 2) if and how exemptions from the deterministic scoping and screening criteria may be sought. The meeting slides for the NRC are available at ADAMS Accession No. ML20149K639. The meeting slides for the Electric Power Research Institute (EPRI) are available at ADAMS Accession No. ML20147A241.

The NRC staff began by explaining the possibilities that they have been exploring as part of EMBARK Venture Studio. Three possibilities emerged for which the staff wished to engage industry, in order to determine interest and feasibility. They are: using formal risk information as part of the AMP implementation, applying risk information gleaned from 50.69 categorization to Aging Management Review Line Items, and seeking exemptions to the deterministic scoping and screening criteria.

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The remainder of the meeting consisted of a presentation by the EPRI Leveraging Risk Insights Working Group entitled, "Use of Risk Information in the Implementation of Aging Management Programs." The Working Group, in which there is broad industry engagement, was formed in fall 2019 with a focus on the implementation of AMPs. As shown on slide 2, this is seen as an opportunity to:

enhance [AMP] implementation to better meet long-term needs by delivering an integrated, sustainable framework emphasizing high impact and high value activities that reinvest technical knowledge and resources to better manage aging.

The desired outcomes include optimizing AMP implementation, leveraging existing risk insights, and including a continuous improvement process.

EPRI then noted two key limitations on the use of existing PRA. The 1995 Statements of Consideration for the License Renewal Rule caution that PRA arguments alone are not an acceptable basis for concluding that aging management risks are being adequately managed. Also, practitioners of PRA note that aging can have an effect on PRA results that is not readily quantifiable. This current effort is not intended to take PRA beyond its current state of the art. An aging management PRA will not be developed. EPRI then cited statements in the 1991 and 1995 statements of consideration for license renewal and the PRA Policy Statement.

Since that time, plants have invested heavily in developing site-specific PRAs. There are also now several formal regulatory programs that use PRAs, such as fire protection. Some of those have already had effects on license renewal aging management programs.

The general goal of the framework is to apply risk insights and deterministic criteria to screen components into different significant rankings. Some of the considerations for developing the framework included: using consequences as the basis for actions, considering mitigating actions and bridging strategies, and building a component level understanding of risk. There are five AMPs that are being considered for tabletop exercises: Selective Leaching, Medium Voltage Inaccessible Cables-Testing Frequency, Fire Water System-Fire Sprinklers, Buried Pipe, and Internal Coatings.

The working group is developing a risk matrix/heat map to determine relative risk significance rankings. First, the different age-related degradation mechanisms (ARDMs) for the AMPs will be broken out. Some AMPs have multiple ARDMs. Then, the affected components should be identified with as much information as possible (including identification numbers). Next, the scale for the y axis (likelihood of a ARDM occurring and progressing to the failure of the component) should be defined. Multiple scales are permitted. Similarly, the scale for the x-axis (the consequence of the failure of the SSCs) should be defined. Licensees may include multiple types of consequences-environmental, financial, operational, etc. Next, the affected components should be placed on the heat map. Decisions about how to integrate the different scales and consequences will have to be made.

Once the items have been placed in the heat map, new aging management strategies may be considered. These include:

- Proactive replacement: instead of inspecting components which are likely to require replacement, replace them proactively without the expense of an inspection

- Bridging Strategies: influence, but not necessarily eliminate, the consequence of failure (ex: leak monitoring)
- Mitigating Strategies: influence, but not necessarily eliminate, the likelihood of failure (ex: cathodic protection)
- Inspection of Surrogates: inspect a component that has a lower operational risk for inspections in lieu of a similar component that experiences the same ARDM and has a higher operational risk for inspection

In response to NRC questions, EPRI clarified that any of the new aging management strategies that are considered would then be processed through whichever existing change management program is appropriate. One way that plants may choose to keep track of this, is through their Corrective Action Programs. NRC also observed that the surrogate inspection strategy is counter to the approach for risk-informed in-service inspection.

EPRI then discussed the expected timeline for the next steps. High level tabletop exercises are now being performed. An update is scheduled to be released later in the summer. NRC expressed interest in reengaging after reviewing the paper. Afterwards, more detailed tabletop exercises are planned. Then, a base case will be performed later in the year at a plant, followed by a report in 2021. Some utilities have expressed interest in participating in the process, but it is too early to identify them.

As the last slide of the EPRI presentation, the NRC, EPRI, and other members of industry discussed potential future uses of formal risk insights in license renewal. There was general support for using risk insights to focus on the most safety-significant areas. One industry commenter noted that a rule change would be disruptive given that licensees begin to prepare their applications approximately two years before submittal. Furthermore, even with adjustments to scoping and screening, the application is likely to end up with the same number of aging management programs. Another commenter discussed the significant investment that licensees have already made in implementing 50.69 risk categorizations and suggested a graded approach to scoping and screening. If the NRC allows for existing risk-related programs to be applied to license renewal, then over 90 percent (estimated) of the potential benefit could possibly be achieved without a rulemaking. The NRC indicated that they are looking into those possible applications now.

The industry and the NRC will reengage after EPRI issues the update later in the summer.

Enclosure:  
List of Meeting Participants

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RISK INSIGHTS IN LICENSE RENEWAL (EMBARK VENTURE STUDIO)  
DATED June 15, 2020

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DATE	6/15/20	6/15/20	

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## **List of Participants**

Approximately 145 NRC staff, industry representatives, and members of the public attended the webinar virtually. The ones listed below spoke during the meeting.

### **NAME**

Lauren Gibson  
Angela Buford  
Alex Chereskin  
Allen Hiser  
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### **AFFILIATION**

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