From:	Carolyn Lauron
To:	Justin Hawkins
Cc:	Demetrius Murray; Greg Cranston; Michael Dudek
Subject:	NRC Staff Response to the Clarification Question regarding Software for Structural Analysis
Date:	Monday, September 26, 2022 10:28:00 AM

Hi Justin –

The NRC staff response to the subject clarification question is found below.
I believe this question is related to the topic for tomorrow's public meeting on seismic methodology and the staff will be available to discuss the response further if needed.

Please let us know if you have additional questions or need more information.

Thank you,
Carolyn Lauron
US NRC

Question:
What is the NRC's current position on using STAAD.Pro (Connect Edition) for performing nuclear building qualification, including but not limited to linear response spectrum and time history analyses?

Context:
Based on past experience, the thought by my engineer was that the NRC preferred the use of ANSYS for structural qualification as there were various unresolved software issues (bugs) with STAAD.Pro's dynamic analysis.

NRC Staff Response:
The NRC does not have preferred programs for analyzing a design. The NRC guidance provides one acceptable approach or method for meeting the regulations. An applicant may submit for NRC staff review other methods or approaches for analyzing its design to determine whether it meets the relevant regulations; e.g., Appendix B to 10 CFR Part 50 and 10 CFR Part 21 for Commercial grade dedication.

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," (SRP), Section 3.8.1, "Concrete Containment," provides guidance related to computer programs for structural applications (ML13198A245). As discussed in Subsection II.4.F, the computer programs used in design and analysis should be described and validated by appropriate procedures or criteria, and is a specific topic of interest for the structural audit.

Computer programs are acceptable if the validation provided follows the procedures delineated in SRP Section 3.8.1, Subsection II.4.F on starting on page 3.8.1-14:

> F. Computer Programs. The computer programs used in the design and analysis should be described and validated by any of the following procedures or criteria:
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> i. The computer program is recognized in the public domain and has had sufficient history of use to justify its applicability and validity without further demonstration.

ii. The computer program's solutions to a series of test problems have been demonstrated to be substantially identical to those obtained by a similar and independently written and recognized program in the public domain.
The test problems should be demonstrated to be similar to or within the range of applicability of the problems analyzed by the public domain computer program.

iii. The computer program's solutions to a series of test problems have been demonstrated to be substantially identical to those obtained from classical solutions or from accepted experimental tests or to analytical results published in technical literature. The test problems should be demonstrated to be similar to or within the range of applicability of the classical problems analyzed to justify acceptance of the program.

A summary comparison should be provided for the results obtained in the validation of each computer program.