



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

November 26, 2019

Ms. Margaret M. Doane  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT:** NUREG/KM-0013, "CREDIBILITY ASSESSMENT FRAMEWORK FOR CRITICAL BOILING TRANSITION MODELS - A GENERIC SAFETY CASE TO DETERMINE THE CREDIBILITY OF CRITICAL HEAT FLUX AND CRITICAL POWER MODELS, DRAFT REPORT FOR COMMENT"

Dear Ms. Doane:

During the 668<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards, November 6-8, 2019, we reviewed the staff's knowledge management publication, NUREG/KM-0013, "Credibility Assessment Framework for Critical Boiling Transition Models - A Generic Safety Case to Determine the Credibility of Critical Heat Flux and Critical Power Models, Draft Report for Comment." Our review was also informed by staff presentations on April 18, 2019, and August 21, 2019, to the Thermal-Hydraulic Subcommittee, during which a draft of the assessment framework was successfully applied to the staff's review of the D5 correlation for SVEA-96 Optima3 fuel.

### **CONCLUSION AND RECOMMENDATION**

1. The credibility assessment framework documented in NUREG/KM-0013 is an innovative technical approach to review the adequacy of data-driven models.
2. Extending this framework to other data-driven model applications should be explored.

### **DISCUSSION**

NUREG/KM-0013 offers a systematic and auditable approach to the review of data-driven models, also referred to as correlations. Such models are used across the industry to apply results from separate effects experiments to licensing calculations.

The credibility assessment framework considers three high-level decisions that assess: the goodness of the experimental data, the adequacy of the model generation, and the validation of the final correlation and its uncertainties. The framework allows the staff to systematically break down their review into small logical segments that allow efficient evaluation of these high-level decisions. One worthy example is how the methodology allows the objective definition of subjective terms such as "safe." In the process, the evaluation documents the review in an auditable way that can be easily traced and updated for future applications.

Even though NUREG/KM-0013 focuses exclusively on the assessment of critical boiling transition models, this approach could be used for other data-driven models and its use should be explored. For example, a similar approach could be used to assess correlations for experimental material property data, CRUD (Chalk River Unidentified Deposit or Corrosion Residual Unidentified Deposit) deposition and removal from fuel, or thermal-hydraulic parameters such as heat transfer coefficients.

## **SUMMARY**

The credibility assessment framework documented in NUREG/KM-0013 is an innovative technical approach to review the adequacy of data-driven models. Extending this framework to other data-driven model applications should be explored.

Sincerely,

**/RA/**

Peter Riccardella  
Chairman

## **REFERENCE**

1. NUREG/KM-0013. "Credibility Assessment Framework for Critical Boiling Transition Models - A Generic Safety Case to Determine the Credibility of Critical Heat Flux and Critical Power Models, Draft Report for Comment," March 2019 (ADAMS Accession Number ML19073A249).

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