



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

June 21, 2017

Mr. Victor M. McCree  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT: INTERIM LETTER: CHAPTERS 6, 12, 13, 14, 16, 17, AND 19 OF THE NRC STAFF'S SAFETY EVALUATION REPORT WITH OPEN ITEMS RELATED TO THE CERTIFICATION OF THE APR1400 DESIGN**

Dear Mr. McCree:

During the 644<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards, June 7-9, 2017, we met with representatives of the Korea Electric Power Corporation (KEPCO) and Korea Hydro & Nuclear Power Company, Ltd. (KHNP) and the NRC staff to review the following chapters of the safety evaluation report (SER) with open items associated with the APR1400 design certification application:

- Chapter 6, "Engineered Safety Features"
- Chapter 12, "Radiation Protection"
- Chapter 13, "Conduct of Operations"
- Chapter 14, "Verification Programs"
- Chapter 16, "Technical Specifications"
- Chapter 17, "Quality Assurance and Reliability Assurance"
- Chapter 19, "Probabilistic Risk Assessment and Severe Accident Evaluation"

Our APR1400 Subcommittee also reviewed these chapters during meetings on February 24, March 21-23, April 5, and April 19-20, 2017. We also had the benefit of the referenced documents.

## **CONCLUSIONS**

1. Except for the current SER open items and the concern that is highlighted in Conclusion 2, our review of these chapters did not identify any other issues with potentially significant safety implications that merit special attention at this interim stage of the review.
2. The probabilistic risk assessment and Chapter 19 are being revised. Because new substantive technical information will be introduced late in the review process, it may extend the review schedule.

## **BACKGROUND**

KHNP submitted a design certification application for the APR1400 on December 23, 2014. We have agreed to review the SER on a chapter-by-chapter basis to identify technical issues that may merit further consideration by the staff. This process will aid in the resolution of concerns and facilitate timely completion of the design certification review. Accordingly, the staff has provided Chapters 6, 12, 13, 14, 16, 17, and 19 of the SER with open items for our review. The staff's SER and our review of these chapters addressed design control document (DCD), Revision 0 and supplemental material, including KHNP responses to staff requests for additional information.

## **DISCUSSION**

The current open items from these SER chapters identify technical issues that must be resolved during the staff's final review. As part of our reviews, we have requested additional information about details of the APR1400 design. We identified one issue that merits special attention at this time.

We reviewed the version of the probabilistic risk assessment (PRA) provided in Revision 0 of the DCD and concluded that, in general, the content of the PRA is adequate. We were informed that a substantial update to the PRA is currently in progress. That update will involve changes to the risk models and analyses for some initiating events and reevaluations of several required human actions. Those changes will affect the overall risk results, including information that is used to identify candidate structures, systems, and components for inclusion in the reliability assurance program. Those changes will also affect the PRA documentation in the DCD. Due to time and schedule constraints it is unlikely that we will be able to review the revisions until the staff completes its SER with no open items. Significant issues identified at that late time could cause delay.

Sincerely,

**/RA/**

Dennis C. Bley  
Chairman

## **REFERENCES**

1. Korea Electric Power Corporation and Korea Hydro & Nuclear Power Company, Ltd., "Korea Electric Power Corporation and Korea Hydro & Nuclear Power Co., Ltd Application for Design Certification of the APR1400 Standard Design," December 23, 2014 (ML15006A098).
2. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 6, 'Engineered Safety Features'," February 28, 2017 (ML17006A031).
3. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter for Chapter 12, 'Radiation Protection'," January 27, 2017 (ML17019A085).

4. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 13, 'Conduct of Operations'," February 27, 2017 (ML17039B093).
5. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 14, 'Initial Test Program and Inspections, Test, Analysis and Acceptance Criteria'," March 17, 2017 (ML17058A396).
6. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 16, 'Technical Specifications'," February 21, 2017 (ML17006A049).
7. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 17, 'Quality Assurance and Reliability Assurance'," March 22, 2017 (ML17059D459).
8. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 19, 'Probabilistic Risk Assessment and Severe Accident Evaluation'," March 23, 2017 (ML17059D492).
9. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 19.3, 'Beyond Design Basis External Event'," March 24, 2017 (ML17068A105).
10. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 19.4, 'Loss of Large Areas of the Plant Due to Explosion or Fire'," March 23, 2017 (ML17068A113).
11. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 19.5, 'Aircraft Impact Assessment'," March 23, 2017 (ML17068A129).

4. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 13, 'Conduct of Operations'," February 27, 2017 (ML17039B093).
5. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 14, 'Initial Test Program and Inspections, Test, Analysis and Acceptance Criteria'," March 17, 2017 (ML17058A396).
6. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 16, 'Technical Specifications'," February 21, 2017 (ML17006A049).
7. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 17, 'Quality Assurance and Reliability Assurance'," March 22, 2017 (ML17059D459).
8. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 19, 'Probabilistic Risk Assessment and Severe Accident Evaluation'," March 23, 2017 (ML17059D492).
9. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 19.3, 'Beyond Design Basis External Event'," March 24, 2017 (ML17068A105).
10. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 19.4, 'Loss of Large Areas of the Plant Due to Explosion or Fire'," March 23, 2017 (ML17068A113).
11. U.S. Nuclear Regulatory Commission, "Advanced Power Reactor 1400 Design Certification Application – Safety Evaluation with Open Items for Chapter 19.5, 'Aircraft Impact Assessment'," March 23, 2017 (ML17068A129).

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