December 19, 2013

Dr. Byung-Oke Cho
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Korea Hydro and Nuclear Power Co., Ltd.
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Gangnam-Gu
Seoul 135-791, KOREA

Dr. Hee-Yong Lee
Executive Vice President
Korea Electric Power Corporation
512 Yeongdong-Daero
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Seoul 135-791, KOREA

SUBJECT: KOREA HYDRO AND NUCLEAR POWER CO., LTD., AND KOREA ELECTRIC POWER CORPORATION – NON-ACCEPTANCE OF THE APPLICATION FOR STANDARD DESIGN CERTIFICATION OF THE APR1400

Dear Dr. Cho and Dr. Lee:

By letter to the Nuclear Regulatory Commission (NRC) dated September 30, 2013, Korea Hydro and Nuclear Power Co., Ltd., and Korea Electric Power Corporation submitted an application for a standard design certification of the Advanced Power Reactor 1400 (APR1400), pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." The purpose of this letter is to inform you that the NRC staff has decided not to accept the APR1400 design certification application for docketing at this time.

In accordance with 10 CFR 2.815, 10 CFR 52.46, and 10 CFR 52.47, the NRC staff performed an acceptance review to determine if the design certification application for the APR1400 is sufficiently complete and technically adequate to allow the staff to conduct its detailed technical review and complete it within a predictable timeframe. Since April 2010, we have discussed many issues with you at pre-application review meetings and a pre-application audit. As a result, you provided an enhanced level of design detail in the application in several areas, in particular, long-term core cooling and seismic evaluation. With respect to your design certification application, the staff finds that a majority of the chapters and sections contain sufficient information to conduct the review.

However, for reasons presented below, the NRC staff has decided not to docket the APR 1400 design certification application at this time. During the December 11-12, 2013, public meeting, the NRC staff communicated to you the application's deficiencies in the areas of instrumentation and controls (I&C), human factors engineering, probabilistic risk assessment, and in the environmental report. The two key I&C issues for which the application did not provide sufficient information are the software common cause failures of non-safety related control systems that can lead to spurious actuations of redundant safety and non-safety components; and the critical

characteristics, such as deterministic performance and the software development process of the safety I&C system platform. Additionally, the NRC staff determined that the application did not provide a sufficient level of detail related to reactor coolant pump design; leak-before-break evaluation; effects of irradiation-assisted stress corrosion cracking on core supports and reactor internals; turbine missile probability; welds for reactor vessel integrity evaluations; radioactive waste management; and radiation protection. The NRC staff also notes that you have not yet submitted technical reports in the following areas: vibration assessment of reactor internals; flywheel integrity; fuel seismic response evaluation; and new and spent fuel criticality analysis.

The NRC staff plans to continue pre-application interactions with your staff to support your efforts at resolving the staff's concerns and in developing the necessary information to support a complete application. Once the deficiencies have been addressed, the application may be resubmitted to the NRC.

If you have any questions, please contact me at David.Matthews@nrc.gov or 301-415-1199, or Jeffrey Ciocco, the Lead Project Manager, at Jeff.Ciocco@nrc.gov or 301-415-6391.

Sincerely,

/RA/

David B. Matthews, Director
Division of New Reactor Licensing
Office of New Reactors

Project No. 0782

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