## KHNPDCDRAIsPEm Resource

**From:** Sutton, Mallecia
**Sent:** Wednesday, November 30, 2016 12:40 PM
**To:** apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; jiyong.oh5@gmail.com; Jungho Kim (jhokim082@gmail.com); James Ross
**Cc:** Palmrose, Donald; Burkhart, Lawrence; Ciocco, Jeff; Donoghue, Joseph
**Subject:** APR1400 Design Certification Application RAI 3-8655 (EA ACC/SAMDA - Severe Accident Mitigation Design Alternatives )
**Attachments:** APR1400 DC RAI 3 RPAC 8655.pdf

KHNP,

The attachment contains the subject request for additional information (RAI). This RAI was sent to you in draft form. Your licensing review schedule assumes technically correct and complete responses within 30 days of receipt of RAIs. However, KHNP requests, and we grant, 90 days to respond to this RAI. We may adjust the schedule accordingly.

Please submit your RAI response to the NRC Document Control Desk.

*Mallecia Sutton*
*Environmental Project Manager*
*U.S.Nuclear Regulatory Commission*
*Two White Flint North*
*11545 Rockville Pike*
*Rockville, MD 20852-27388*
*Mailstop:T6C32*
*301-415-0673*

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**From:** Sutton, Mallecia

**Created By:** Mallecia.Sutton@nrc.gov

**Recipients:**
"Palmrose, Donald" <Donald.Palmrose@nrc.gov>
Tracking Status: None
"Burkhart, Lawrence" <Lawrence.Burkhart@nrc.gov>
Tracking Status: None
"Ciocco, Jeff" <Jeff.Ciocco@nrc.gov>
Tracking Status: None
"Donoghue, Joseph" <Joseph.Donoghue@nrc.gov>
Tracking Status: None
"apr1400rai@khnp.co.kr" <apr1400rai@khnp.co.kr>
Tracking Status: None
"KHNPDCDRAIsPEm Resource" <KHNPDCDRAIsPEm.Resource@nrc.gov>
Tracking Status: None
"jiyong.oh5@gmail.com" <jiyong.oh5@gmail.com>
Tracking Status: None
"Jungho Kim (jhokim082@gmail.com)" <jhokim082@gmail.com>
Tracking Status: None
"James Ross" <james.ross@aecom.com>
Tracking Status: None

**Post Office:** HQPWMSMRS04.nrc.gov

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# REQUEST FOR ADDITIONAL INFORMATION 3-8655

Issue Date: 11/30/2016
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: EA ACC/SAMDA - Severe Accident Mitigation Design Alternatives
Application Section:

## QUESTIONS

### EA ACC/SAMDA-1

On May 4, 2016, the Commission issued a decision (CLI-16-07; Agencywide Documents Access and Management System (ADAMS) Accession No. ML16125A150) in the Indian Point license renewal proceeding. The Commission found that none of the parties involved in the Indian Point Severe Accident Mitigation Alternatives (SAMA) contention could provide a documented description outlining the technical foundation for two inputs (the time to decontaminate, TIMDEC, and the cost to decontaminate non-farmland, CDNFRM) used in the MACCS computer analyses. It was noted by the Commission that sensitivity analyses help demonstrate whether and to what extent variations in an uncertain input value might affect the overall cost-benefit conclusions. The Commission therefore directed the Staff to perform additional sensitivity analyses varying the TIMDEC and CDNFRM input parameters using specific values.

The TIMDEC and CDNFRM parameters used in the Indian Point SAMA analysis are also commonly used in the off-site risk calculations applied in the Severe Accident Mitigation Design Alternatives (SAMDA) cost-benefit analyses performed for new reactor standard design certification and combined license applications. These two input values were generally based on the values provided in NUREG 1150, “Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants,” and NUREG/CR-3673, “Economic Risks of Nuclear Power Reactor Accidents.” The TIMDEC input value defines the time required for completing decontamination to a specified degree. The CDNFRM input parameter defines the cost (on a per person basis) of decontaminating non-farmland by a specified decontamination factor. The input values applied are set based on the level of contamination as specified by the decontamination factor parameter, DF. The CDNFRM values used in NUREG-1150 stem from decontamination cost estimates provided in NUREG/CR-3673, the same 1984 economic risk study referenced in support of the decontamination time inputs. These decontamination cost inputs are commonly set to specific values associate with different levels of contamination and escalated to account for inflation.

The SAMDA analysis performed for the Advanced Power Reactor 1400 (APR1400) Standard Design Certification (DC) also relied upon the NUREG-1150 values for TIMDEC and CDNFRM. Therefore, the staff requires the applicant to justify why the TIMDEC and CDNFRM parameters used in the SAMDA analysis for the APR1400 DC are acceptable or perform a cost-benefit sensitivity analyses based on revised TIMDEC and CDNFRM values for the applied DF levels.

If sensitivity analyses will be performed, use input values for the sensitivity analysis either (1) based on information in CLI-16-07 for the appropriate sets of DF values or, in the alternative, (2) selected by the applicant and appropriately justified for the sensitivity analyses. Since two decontamination levels are currently assessed in the APR1400 MACCS calculation (i.e., low contamination levels with a DF=3 and high contamination levels with a DF=15), apply a set of maximum values for a DF=3 and another set of maximum values for a DF=15. Explain with sufficient justification your appropriate maximum values for TIMDEC and CDNFRM for each DF value. With the revised values, re-assess the offsite risks and apply the revised results into the SAMDA cost-benefit analysis for a revised maximum averted costs. Determine if there is now a SAMDA that could be cost-beneficial based on the revised decontamination inputs and justify the resulting determination.

Upon completing the analyses, document the sensitivity analyses in an appropriate manner in the APR1400 Standard Design Certification Environmental Report and related technical document(s).