

April 11, 2016

Eugene O'Donnell  
Licensing and EQ Lead  
HF Controls Corporation  
1624 West Crosby Road  
Suite 124  
Carrollton, TX 75006

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR DOOSAN HF CONTROLS  
CORP. HFC-6000 SAFETY SYSTEM PLATFORM TOPICAL REPORT  
AMENDMENTS FOR ENHANCED EQUIPMENT (TAC NO. MF0597)

Dear Mr. O'Donnell:

On April 27, 2011, the U.S. Nuclear Regulatory Commission (NRC) staff issued a Safety Evaluation for the Doosan HF Controls Corporation (HFC), "HFC-6000 Safety System" Topical Report (TR) PP901-000-01, Revision C (Agencywide Documents Access and Management System (ADAMS) Accession No. ML110831017), for the HFC-6000 safety system platform for use in digital upgrades in nuclear power plants.

By letters dated September 30, 2011 and August 31, 2012 (ADAMS Accession Nos. ML11297A041 and ML131420097), HFC submitted two amendments (Amendments 2 and 3) to the approved TR for NRC staff review. These TR amendments, "Amendment for the Enhanced Equipment of HFC-6000 Safety Evaluation Report," and "Amendment for Fast Performance Controller Platform of HFC-6000 Safety Evaluation Report," include enhanced equipment for use with the approved HFC-6000 safety system platform.

The NRC staff performed an acceptance review of TR Amendments 2 and 3 and by letter dated May 14, 2015 (ADAMS Accession No. ML15114A004), concluded that supplemental information was needed to perform the review. In response to the NRC's acceptance review letter requesting supplemental information HFC submitted letters dated June 15, June 26, and July 9, 2015 (ADAMS Accession Nos. ML15175A314, ML15198A275, and ML15211A292). By letter dated September 10, 2015 (ADAMS Accession No. ML15222A009), the NRC staff found the supplemental information submitted by HFC to be sufficient to perform the review of the HFC-6000 TR amendments for enhanced equipment.

Upon review of the information provided, the NRC staff has determined that additional information is needed to complete the review. The request for additional information (RAI) questions are provided in the enclosure to this letter. In an email exchange with you representing HFC it was agreed that the NRC staff will receive your RAI responses by April 30, 2016.

E. O'Donnell

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If you have any questions regarding the enclosed RAI questions, please contact me at 301-415-7297 or [Joseph.Holonich@nrc.gov](mailto:Joseph.Holonich@nrc.gov).

Sincerely,

/RA/

Joseph J. Holonich, Sr. Project Manager  
Licensing Processes Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Project No. 731

Enclosure:  
RAI questions

E. O'Donnell

- 2 -

If you have any questions regarding the enclosed RAI questions, please contact me at 301-415-7297 or Joseph.Holonich@nrc.gov.

Sincerely,

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Enclosure:  
RAI questions

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**ADAMS Accession No.:ML16068A138;**

**\*concurred via e-mail**

**NRR-106**

<b>OFFICE</b>	DPR/PLPB/PM	DPR/PLPB/LA*	DE/EICB/BC	DPR/PLPB/BC	DPR/PLPB/PM
<b>NAME</b>	JHolonich	DHarrison	MWaters	KHsueh	JHolonich
<b>DATE</b>	4/28/16	03/22/2016	3/30/16	04/08/2016	4/11/16

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**REQUEST FOR ADDITIONAL INFORMATION**  
**FOR DOOSAN HF CONTROLS CORP.**  
**HFC-6000 SAFETY SYSTEM PLATFORM**  
**TOPICAL REPORT AMENDMENTS FOR ENHANCED EQUIPMENT**  
**(TAC NO. MF0597)**

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The NRC staff has identified additional information that is needed to complete the technical review. The following request for additional information (RAI) questions are related to open items that have been discussed with HFC during monthly conference calls.

RAI-1 (related to Open Items 1, 6.1, 7, 8, 9, 11, 12, 15, and 16.1)

The HFC-6000 TR Amendments 2 and 3 and the supplemental documentation provided identify several modules that can be used with the HFC-6000 safety system platform. In order to perform the review of the TR amendments, HFC must identify which modules are part of the NRC review, as well as the necessary identification information for the modules. Therefore, please provide a table listing all modules that are part of the HFC-6000 safety system platform TR amendments and within the scope of the NRC review. Also, for each module provide the following information:

- module name,
- module type (function),
- base part number (see the note below),
- part number (without bezel),
- part number with bezel (if applicable),

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- test system (i.e., ERD921 or ERD1192),
- test specimen(s) within the test system (i.e., TUV Triple Modular Redundancy (TMR), TUV Double Modular Redundancy (DMR), Single-Loop Controller (SLC) SBC04A, Remote 1 SBC06, or Remote 3 FPC08).

Note: For the modules that have a common printed circuit board (PCB) but whose part number changes based on variations in the firmware and/or software, or based on a hardware change (e.g., fuses, electrical housing), please include a column in the table that specifies the base PCB part number.

RAI-2 (related to Open Item 15)

The HFC-6000 TR Amendments 2 and 3 include enhanced modules for use with the HFC-6000 safety system platform. These modules were tested as part of several test specimens (i.e., TUV TMR, TUV DMR, SLC SBC04A, Remote 1 SBC06, and Remote 3 FPC08) within two test systems (i.e., ERD921 and ERD1192).

The Environmental Qualification (EQ) for the HFC-6000 enhanced modules was conducted using multiple data sets for each of the following EQ testing areas: Temperature/Humidity, Radiation, Electromagnetic Interference/Radio-frequency Interference (EMI/RFI), and Seismic. HFC must identify the EQ data sets for these four EQ testing areas, and identify which EQ data sets apply to the enhanced modules.

- a. For each of the EQ testing areas (i.e., Temperature/Humidity, Radiation, EMI/RFI, and Seismic), please provide a table identifying the applicable EQ data sets.

Additionally, please identify in these tables the following information for each EQ data set: relevant sections in the TR amendment where the data sets are described, relevant supporting documentation (e.g., test procedures and test reports (including summary reports and laboratory test reports)), and any applicable notes.

- b. For each of the EQ testing areas (i.e., Temperature/Humidity, Radiation, EMI/RFI, and Seismic), please provide a table that specifies the applicable EQ data set (see RAI-2.a, above) for each of the enhanced modules.

RAI-3 (related to Open Item Clarifications C7.1 and C15.1.a)

Table 1 of TR901-201-03, Rev. B, "ERD921 Environmental Stress Detail Test Report," shows the Jasper 24 volts Power Supply and the Jasper Power Supply Rack for the ERD921 test specimen. However, the master configuration lists for the DMR (VV901-301-02-PI, Rev. C), TMR (VV901-302-02-PI, Rev. C), and SLC HFC-SBC04A (VV901-303-02-PI, Rev. C) show Kepco Power Supplies and Racks for the ERD921 test specimen.

Please specify which power supplies were used in the ERD921 test specimens and specify the updated revision to the documentation that shows these power supplies (i.e., "ERD921 Environmental Stress Detail Test Report" and/or MCLs) as applicable.