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August 19, 2016

PROJ0731

United States Nuclear Regulatory Commission
11555 Rockville Pike,
Rockville, Maryland 20852

Document Control Desk,
U.S. Nuclear Regulatory Commission,
Washington, DC 20555-0001

Subject: Response and supporting documents for HFC-6000 TR Amendments Open Items List

Reference: HFC-6000 Safety Control System

Ladies and Gentlemen:

During the a series of conference calls in 2016 between HFC and the USNRC, a list of supporting documents were mentioned in response to Open Items provided by the USNRC. Additionally three Requests for Additional Information were issued to HFC by the USNRC on April 11th, 2016. HFC is submitting these documents for review with this letter with the goal of resolving many of these open items, as well as directly responding the April 11th 2016 Requests for Additional Information.

We thank the agency for the work.

Yours Truly,

Eugene O'Donnell
Interim V&V Department Manager
Doosan HF Controls

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NRR

Enclosures:

1. Justification of Proprietary Information
2. Proprietary Information Notice
3. Radiation Exposure Evaluation of HFC-6000 HFC-FPC08
4. ERD111 Operability Test Procedure
5. ERD111 Prudency Test Procedure
6. ERD111 Pre-qualification before Retest Detail Test Report (before retest)
7. ERD111 Environmental Stress Retest Detail Report
8. ERD111 EMI-RFI Retest Detail Report
9. ERD111 Post-qualification Detail Test Report (after retest)
10. ERD 1192 Seismic Test Procedure
11. ERD921 DMR Operability Test Procedure
12. ERD921 DMR Prudency Test Procedure
13. ERD921 TMR Operability Test Procedure
14. ERD921 TMR Prudency Test Procedure
15. ERD921 SLC Operability Test Procedure
16. ERD921 SLC Prudency Test Procedure
17. ERD921 Pre-qualification Detail Test Report
18. ERD921 Environmental Stress Detail Test Report
19. ERD921 EMI-RFI Detail Test Report
20. ERD1192 Operability Test Procedure Remote 01 SBC06
21. ERD1192 Operability Test Procedure Remote 03 FPC08
22. ERD1192 Prudency Test Procedure Remote 01 SBC06
23. ERD1192 Prudency Test Procedure Remote 03 FPC08
24. ERD1192 Master Configuration List
25. TUV DMR Master Configuration List
26. TUV TMR Master Configuration List
27. HFC-SBC04A System Master Configuration List
28. Radiation Test Reports
29. Certificate of Test for environmental testing on ERD111 and ERD 921
30. Certificate of Test for environmental testing on ERD1192
31. NEMKO EMI/RFI Test Report for ERD111 and ERD921
32. Wyle Seismic Test Report for ERD1192
33. NEMKO EMI/RFI Test Report for ERD 1192
34. ERD111/ERD921 Power Distribution
35. Loop Layout Table of PCB Assemblies ERD111/TUV
36. Loop Layout Table of PCB Assemblies ERD1192
37. Power Distribution Test Equipment Assembly for ERD1192
38. Cable Configuration for ERD1192
39. Test Equipment Assembly for ERD1192
40. Rear Panel Lefthand Assembly for ERD1192
41. Rear Panel Righthand Assembly for ERD1192
42. Schematic Wiring Diagram Cover Page USNRC Qualification TSAP for ERD1192
43. Schematics FPC08 Remote 3 I/O Cards Title Page for ERD1192
44. Logic Diagrams SBC04A Logic Symbols Remote 1 Loop 0151

45. Schematic Wiring Diagram Cover Page USNRC Qualification TSAP for ERD111
46. TSAP Configuration System Assembly Drawing for ERD111/ERD921
47. Schematics TUV-TMR Field Termination Cards Remotes 1,2,3 MFT A,B,C for ERD921
48. Schematics TUV-TMR Field Termination Cards Remotes 2 MFT B for ERD921
49. Schematics TUV-TMR Field Termination Cards Remotes 3 MFT C for ERD921
50. Schematics TUV-TMR Field Termination Cards Remotes 4 MFT for ERD921
51. Schematics TUV-TMR I/O Cards Remotes 1 MFT A for ERD921
52. Schematics TUV-TMR I/O Cards Remotes 2 MFT B for ERD921
53. Schematics TUV-TMR I/O Cards Remotes 3 MFT C for ERD921
54. Schematics TUV-TMR I/O Cards Remotes 4 MFT A for ERD921
55. HFC-SBC04A Failure Analysis and Resolution Action Report
56. Compressed file containing bills of materials for all modules under review
57. HFC-6000 Control System Safety Evaluation and Topical Report Including Request for Additional Information Responses
58. Responses to First Round of RAI from NRC in correspondence to HFC Amendments 2 and 3 for the HFC-6000 Platform

Supporting documents in Proprietary and Non-Proprietary versions:

Document Number	Description	Revision
PP901-000-01-A-NP	HFC-6000 Control System Safety Evaluation and Topical Report Including Request for Additional Information Responses	C
RR901-001-04-NP	ERD111 Qualification Retest Summary Report	B
RR901-002-01-NP	Amendment for Enhanced Equipments of HFC-6000 Safety Platform	B
RR901-002-11-NP	Responses to First Round of RAI from NRC in correspondence to HFC Amendments 2 and 3 for the HFC-6000 Platform	A
RR901-003-06-NP	Radiation Exposure Evaluation of HFC-6000 HFC-FPC08	C
TP0402-NP	ERD111 Operability Test Procedure	L
TP0403-NP	ERD111 Prudency Test Procedure	G
TR901-200-02-NP	ERD111 Pre-qualification before Retest Detail Test Report (before retest)	A
TR901-200-03-NP	ERD111 Environmental Stress Retest Detail Report	A
TR901-200-04-NP	ERD111 EMI-RFI Retest Detail Report	A
TR901-200-05-NP	ERD111 Post-qualification Detail Test Report (after retest)	A
TP901-200-04-NP	ERD 1192 Seismic Test Procedure	D
TP901-201-04-NP	ERD921 DMR Operability Test Procedure	E
TP901-201-05-NP	ERD921 DMR Prudency Test Procedure	B
TP901-202-04-NP	ERD921 TMR Operability Test Procedure	D
TP901-202-05-NP	ERD921 TMR Prudency Test Procedure	C
TP901-203-04-NP	ERD921 SLC Operability Test Procedure	C

TP901-203-05-NP	ERD921 SLC Prudency Test Procedure	B
TR901-201-02-NP	ERD921 Pre-qualification Detail Test Report	A
TR901-201-03-NP	ERD921 Environmental Stress Detail Test Report	B
TR901-201-04-NP	ERD921 EMI-RFI Detail Test Report	B
TP901-301-05-NP	ERD1192 Operability Test Procedure Remote 01 SBC06	B
TP901-301-06-NP	ERD1192 Operability Test Procedure Remote 03 FPC08	B
TP901-301-07-NP	ERD1192 Prudency Test Procedure Remote 01 SBC06	B
TP901-301-08-NP	ERD1192 Prudency Test Procedure Remote 03 FPC08	A
VV901-304-01-NP	ERD1192 Master Configuration List	C
VV901-301-02-NP	TUV DMR Master Configuration List	D
VV901-302-02-NP	TUV TMR Master Configuration List	D
VV901-303-02-NP	HFC-SBC04A System Master Configuration List	D
VV901-304-01-NP	ERD1192 Master Configuration List	B
VV0414-NP	ERD111 Master Configuration List	E
Radiation_Exposure	Radiation Test Reports	N/A

Supporting documents sent only as Proprietary:

Document Number	Description	Revision
11188_cert	Certificate of Test for environmental testing on ERD111 and ERD 921	N/A
12057_cert	Certificate of Test for environmental testing on ERD1192	N/A
47110RG1180	NEMKO EMI/RFI Test Report for ERD111 and ERD921	N/A
70369R12	Wyle Seismic Test Report for ERD1192	N/A
1029582RG1180	NEMKOEMI/RFI Test Report for ERD 1192	2
50040801DD-PI	ERD111/ERD921 Power Distribution	D
50040901BB-PI	Loop Layout Table of PCB Assemblies ERD111/TUV	B
50062001HB-PI	Loop Layout Table of PCB Assemblies ERD1192	H
50062101FD-PI	Power Distribution Test Equipment Assembly for ERD1192	F
50062201CD-PI	Cable Configuration for ERD1192	C
50062301DD-PI	Test Equipment Assembly for ERD1192	D
50062701ED-PI	Rear Panel Lefthand Assembly for ERD1192	E
50062801ED-PI	Rear Panel Righthand Assembly for ERD1192	E
50063301DD-PI	Schematic Wiring Diagram Cover Page USNRC Qualification TSAP for ERD1192	D
50063903DB-PI	Schematics FPC08 Remote 3 I/O Cards Title Page for ERD1192	D
50064005CB-PI	Logic Diagrams SBC04A Logic Symbols Remote 1 Loop 0151	C
70090701GD-PI	Schematic Wiring Diagram Cover Page USNRC Qualification TSAP for ERD111	G
70091203BD-PI	TSAP Configuration System Assembly Drawing for ERD111/ERD921	B
70500401BB-PI	Schematics TUV-TMR Field Termination Cards Remotes 1,2,3 MFT A,B,C for ERD921	B

70500402AB-PI	Schematics TUV-TMR Field Termination Cards Remotes 2 MFT B for ERD921	A
70500403AB-PI	Schematics TUV-TMR Field Termination Cards Remotes 3 MFT C for ERD921	A
70500404BB-PI	Schematics TUV-TMR Field Termination Cards Remotes 4 MFT for ERD921	B
70500801AB-PI	Schematics TUV-TMR I/O Cards Remotes 1 MFT A for ERD921	A
70500802AB-PI	Schematics TUV-TMR I/O Cards Remotes 2 MFT B for ERD921	A
70500803AB-PI	Schematics TUV-TMR I/O Cards Remotes 3 MFT C for ERD921	A
70500804AB-PI	Schematics TUV-TMR I/O Cards Remotes 4 MFT A for ERD921	A
RR901-001-06-PI	HFC-SBC04A Failure Analysis and Resolution Action Report	A
BOMs.rar	Compressed file containing bills of materials for all modules under review	N/A

CC: Joseph J. Holonich, Sr. Project Manager
Licensing Process Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation
MS O-12D1

Dr. Steve Yang
Senior VP of Operations
Doosan HF Controls

Justification for Proprietary Information Affidavit

(1) My name is Eugene O'Donnell. I am the V&V Department Manager for Doosan HF Controls (HFC) Corporation and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rulemaking proceedings, and am authorized to apply for its withholding on behalf of Doosan-HFC Corporation.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Doosan HFC application for withholding accompanying this affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Doosan HFC in designating information as trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(a) The information sought to be withheld from public disclosure is owned and has been held in confidence by Doosan HFC Corporation.

(b) The information is of a type customarily held in confidence by Doosan HFC and not customarily disclosed to the public. Doosan HFC has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, uses a uniform method to determine when and whether to hold certain types of information in confidence. The application and substance of our method constitute Doosan HFC's policy and provide the rational basis required.

Under the Doosan HFC method, information is held in confidence if it falls in one or more of several types of information, the release of which might result in the loss of an existing or potential competitive advantage as follows:

- Its use by a competitor would reduce his expenditure of resources and improve his competitive position in the design, manufacture, installation, assurance of quality, or licensing a digital based I&C system.

- It reveals cost or price information, production capacities, budget levels, or commercial strategies of Doosan HFC, its customers or suppliers.

- It reveals aspects of past, present or future Doosan HFC or customer funded development plans and programs of potential commercial value to Doosan HFC.

- ❖ It contains patentable ideas, for which patent protection may be desirable.

For this affidavit, all of the information marked proprietary is because its use by a competitor would reduce his expenditure of resources and improve his competitive position in the design, manufacture, installation, assurance of quality, or licensing a digital based I&C system (type one above). This leads to a Doosan HFC need to restrict certain commercial information from the public to prevent its use by competitors and creating a commercial advantage for them to the detriment of Doosan HFC.

The development of the HFC-6000 system design is the result of many years of development by uniquely experienced personnel in an intensive effort along with the expenditure of a considerable sum of money. In order for competitors to duplicate the Doosan HFC design and applicable information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience would have to be expended for the development of a digital design to equal the HFC-6000 system design.

There are sound Doosan HFC policy reasons behind the Doosan HFC proprietary designation system which include the following:

a) The Use of such information by Doosan HFC gives Doosan HFC a competitive advantage over its competitors. It is therefore, withheld from disclosure to protect the Doosan HFC competitive position.

b) It is information which is marketable in many ways. The extent to which such information is available to competitors diminishes the Doosan HFC ability to sell products involving the use of the information.

c) Use by our competitors would put Doosan HFC at a competitive disadvantage by reducing their expenditure or resources at Doosan HFC expense.

d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Doosan HFC of a competitive advantage.

e) Unrestricted disclosure would jeopardize the position of Doosan HFC in the world market such as South Korea, and thereby give a market advantage to the competition in those countries.

(5) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR 2.390, it is to be received in confidence by the Commission.

(6) Available information has not been previously employed in the same original. The information sought to be protected is not available in public sources or manner or method to the best of our knowledge and belief.

(7) The proprietary information sought to be withheld in the submittal is that which is appropriately marked by deletion, with brackets in some documents, in the following HFC non-proprietary documents:

Document Number	Description	Revision
PP901-000-01-A-NP	HFC-6000 Control System Safety Evaluation and Topical Report Including Request for Additional Information Responses	C
RR901-001-04-NP	ERD111 Qualification Retest Summary Report	B
RR901-002-01-NP	Amendment for Enhanced Equipments of HFC-6000 Safety Platform	B
RR901-002-11-NP	Responses to First Round of RAI from NRC in correspondence to HFC Amendments 2 and 3 for the HFC-6000 Platform	A
RR901-003-06-NP	Radiation Exposure Evaluation of HFC-6000 HFC-FPC08	C
TP0402-NP	ERD111 Operability Test Procedure	L
TP0403-NP	ERD111 Prudency Test Procedure	G
TR901-200-02-NP	ERD111 Pre-qualification before Retest Detail Test Report (before retest)	A
TR901-200-03-NP	ERD111 Environmental Stress Retest Detail Report	A
TR901-200-04-NP	ERD111 EMI-RFI Retest Detail Report	A
TR901-200-05-NP	ERD111 Post-qualification Detail Test Report (after retest)	A
TP901-200-04-NP	ERD 1192 Seismic Test Procedure	D
TP901-201-04-NP	ERD921 DMR Operability Test Procedure	E
TP901-201-05-NP	ERD921 DMR Prudency Test Procedure	B
TP901-202-04-NP	ERD921 TMR Operability Test Procedure	D
TP901-202-05-NP	ERD921 TMR Prudency Test Procedure	C
TP901-203-04-NP	ERD921 SLC Operability Test Procedure	C
TP901-203-05-NP	ERD921 SLC Prudency Test Procedure	B
TR901-201-02-NP	ERD921 Pre-qualification Detail Test Report	A
TR901-201-03-NP	ERD921 Environmental Stress Detail Test Report	B
TR901-201-04-NP	ERD921 EMI-RFI Detail Test Report	B
TP901-301-05-NP	ERD1192 Operability Test Procedure Remote 01 SBC06	B
TP901-301-06-NP	ERD1192 Operability Test Procedure Remote 03 FPC08	B
TP901-301-07-NP	ERD1192 Prudency Test Procedure Remote 01 SBC06	B
TP901-301-08-NP	ERD1192 Prudency Test Procedure Remote 03 FPC08	A
VV901-304-01-NP	ERD1192 Master Configuration List	C
VV901-301-02-NP	TUV DMR Master Configuration List	D
VV901-302-02-NP	TUV TMR Master Configuration List	D
VV901-303-02-NP	HFC-SBC04A System Master Configuration List	D
VV901-304-01-NP	ERD1192 Master Configuration List	B
VV0414-NP	ERD111 Master Configuration List	E

Radiation_Exposure	Radiation Test Reports	N/A

(8) The proprietary information contained within several documents requires that the entire document be held as proprietary. The following documents, files, and their contents are to be withheld in this submittal as proprietary:

Document Number	Description	Revision
11188_cert	Certificate of Test for environmental testing on ERD111 and ERD 921	N/A
12057_cert	Certificate of Test for environmental testing on ERD1192	N/A
47110RG1180	NEMKO EMI/RFI Test Report for ERD111 and ERD921	N/A
70369R12	Wyle Seismic Test Report for ERD1192	N/A
1029582RG1180	NEMKOEMI/RFI Test Report for ERD 1192	2
50040801DD-PI	ERD111/ERD921 Power Distribution	D
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50062001HB-PI	Loop Layout Table of PCB Assemblies ERD1192	H
50062101FD-PI	Power Distribution Test Equipment Assembly for ERD1192	F
50062201CD-PI	Cable Configuration for ERD1192	C
50062301DD-PI	Test Equipment Assembly for ERD1192	D
50062701ED-PI	Rear Panel Lefthand Assembly for ERD1192	E
50062801ED-PI	Rear Panel Righthand Assembly for ERD1192	E
50063301DD-PI	Schematic Wiring Diagram Cover Page USNRC Qualification TSAP for ERD1192	D
50063903DB-PI	Schematics FPC08 Remote 3 I/O Cards Title Page for ERD1192	D
50064005CB-PI	Logic Diagrams SBC04A Logic Symbols Remote 1 Loop 0151	C
70090701GD-PI	Schematic Wiring Diagram Cover Page USNRC Qualification TSAP for ERD111	G
70091203BD-PI	TSAP Configuration System Assembly Drawing for ERD111/ERD921	B
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70500404BB-PI	Schematics TUV-TMR Field Termination Cards Remotes 4 MFT for ERD921	B
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70500802AB-PI	Schematics TUV-TMR I/O Cards Remotes 2 MFT B for ERD921	A
70500803AB-PI	Schematics TUV-TMR I/O Cards Remotes 3 MFT C for ERD921	A
70500804AB-PI	Schematics TUV-TMR I/O Cards Remotes 4 MFT A for ERD921	A
RR901-001-06-PI	HFC-SBC04A Failure Analysis and Resolution Action Report	A
BOMs.rar	Compressed file containing bills of materials for all modules under review	N/A

AFFIDAVIT, STATE OF TEXAS, COUNTY OF Dallas

Before me, the undersigned authority, personally appeared Eugene O'Donnell, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Doosan HF Controls Corporation (HFC) and the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information and belief:

Eugene O'Donnell

RICHARD KIMBALL
My Commission Expires
November 19, 2018

Sworn to and subscribed

Before me this 19th day

of August, 2016

Notary Public