
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.: 271-8290
SRP Section: SRP 19
Application Section: 19.1
Date of RAI Issue: 10/22/2015

Question No. 19-15

Regulation 10 CFR 52.47(a)(27) requires that a standard design certification applicant provide a description of the design specific PRA. SRP Chapter 19, Revision 3 (Draft), Section I. "Areas of Review, Review Interfaces" states that the staff should "...confirm that: All common-cause failure (CCF) mechanisms for digital instrumentation and control (DI&C) systems have been accounted for in the PRA." The staff reviewed APR1400 DCD Section 19.1, "Probabilistic Risk Assessment," and did not find sufficient information describing the modeling of the DI&C system, including the hardware and software common-cause failures, to be able to make this conclusion. Therefore, in order for the staff to reach a reasonable assurance finding that the description of the PRA is adequate, please provide the following details of DI&C modeling in the PRA and include it in the DCD:

- System description (e.g., describe the functions, subsystem interfaces, operator actions, etc.)
- Key assumptions (e.g., modeling, uncertainties)
- CCF analysis of both the hardware and software, including the basis and/or justification of this information
- Failure effects, if modeled at the system/subsystem level

Response

The digital plant protection system (DPPS) consists of the digital reactor trip system (RTS) and the digital engineered safety features actuation system (ESFAS). The reactor trip system (RTS) analyses are documented in the Reactor Protection System Notebook (APR1400-K-P-NR-013218-P, Rev. 0), and the engineered safety features actuation system (ESFAS) analyses are documented in the Engineered Safety Features Actuation System Notebook (APR1400-K-P-NR-

013217-P, Rev. 0), which includes descriptions of the system functions, system interfaces, operator actions, hardware common cause failures and modeling uncertainties.

The failure effects of the reactor trip system (RTS) and the engineered safety features actuation system (ESFAS) are provided as Attachment 1 and 2.

The software reliability analysis has not been evaluated. The industry consensus for the failure probability of software is about 1×10^{-5} /demand for application software and 1×10^{-7} /demand for operating software. These failure probabilities are significantly lower than the hardware failures.

Impact on DCD

There is no impact on the DCD.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

The failure mode and effect analysis of Reactor Trip System (RTS) and Engineered Safety Features Actuation System (ESFAS) will be added to the Reactor Protection System Notebook (APR1400-K-P-NR-013218-P) and the Engineered Safety Features Actuation System Notebook (APR1400-K-P-NR-013217-P).

Failure Mode Evaluation of Reactor Trip System (RP) (1/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
1	1-752-J-PA14A-R01-S01	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts
2	1-752-J-PA14A-R01-S02	PPS cabinet, PA14A (CI631)	Operation	Fails to operate	Yes	- Communication Interface Module - No impacts
3	1-752-J-PA14A-R01-S03	PPS cabinet, PA14A (PM646A)	Operation	Fails to operate	No	- Bistable Logic Processor - Coincidence logic changes to two out of three
4	1-752-J-PA14A-R01-S04	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
5	1-752-J-PA14A-R01-S05	PPS cabinet, PA14A (AI688)	Operation	Fails to operate	No	- Analog Input Module - Coincidence logic changes to two out of three
6	1-752-J-PA14A-R01-S06	PPS cabinet, PA14A (DI620)	Operation	Fails to operate	No	- Digital Input Module - Coincidence logic changes to two out of three
7	1-752-J-PA14A-R01-S07	PPS cabinet, PA14A (AI688)	Operation	Fails to operate	No	- Analog Input Module - Coincidence logic changes to two out of three
8	1-752-J-PA14A-R01-S08	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts
9	1-752-J-PA14A-R01-S09	PPS cabinet, PA14A (DO620)	Operation	Fails to operate	Yes	- Digital Output Module - It is for SOE (Sequence Of Events). - No impacts
10	1-752-J-PA14A-R01-S10	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts
11	1-752-J-PA14A-R02-S01	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts
12	1-752-J-PA14A-R02-S02	PPS cabinet, PA14A (CI631)	Operation	Fails to operate	Yes	- Communication Interface Module - No impacts
13	1-752-J-PA14A-R02-S03	PPS cabinet, PA14A (PM646A)	Operation	Fails to operate	No	- Bistable Logic Processor - Coincidence logic changes to two out of three
14	1-752-J-PA14A-R02-S04	PPS cabinet, PA14A (PM646A)	Operation	Fails to operate	Yes	- Dummy Module - No impacts

Failure Mode Evaluation of Reactor Trip System (RP) (2/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
15	1-752-J-PA14A-R02-S05	PPS cabinet, PA14A (PM646A)	Operation	Fails to operate	No	- Analog Input Module - Coincidence logic changes to two out of three
16	1-752-J-PA14A-R02-S06	PPS cabinet, PA14A (PM646A)	Operation	Fails to operate	No	- Digital Input Module - Coincidence logic changes to two out of three
17	1-752-J-PA14A-R02-S07	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	No	- Analog Input Module - Coincidence logic changes to two out of three
18	1-752-J-PA14A-R02-S08	PPS cabinet, PA14A (DO620)	Operation	Fails to operate	Yes	- Dummy Module - No impacts
19	1-752-J-PA14A-R02-S09	PPS cabinet, PA14A (DO630)	Operation	Fails to operate	No	- Digital Output Module - It is for SOE (Sequence Of Events). - No impacts
20	1-752-J-PA14A-R02-S10	PPS cabinet, PA14A (DO630)	Operation	Fails to operate	Yes	- Dummy Module - No impacts
21	1-752-J-PA14A-R03-S01	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts
22	1-752-J-PA14A-R03-S02	PPS cabinet, PA14A (CI631)	Operation	Fails to operate	No	- Communication Interface Module - Coincidence logic changes to two out of three
23	1-752-J-PA14A-R03-S03	PPS cabinet, PA14A (PM646A)	Operation	Fails to operate	No	- Bistable Processor Logic - No impacts - Coincidence logic changes to two out of three
24	1-752-J-PA14A-R03-S04	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts
25	1-752-J-PA14A-R03-S05	PPS cabinet, PA14A (AI688)	Operation	Fails to operate	No	- Analog Input Module - Coincidence logic changes to two out of three
26	1-752-J-PA14A-R03-S06	PPS cabinet, PA14A (DI620)	Operation	Fails to operate	No	- Digital Input Module - Coincidence logic changes to two out of three
27	1-752-J-PA14A-R03-S07	PPS cabinet, PA14A (AI688)	Operation	Fails to operate	No	- Analog Input Module - Coincidence logic changes to two out of three
28	1-752-J-PA14A-R03-S08	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts

Failure Mode Evaluation of Reactor Trip System (RP) (3/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
29	1-752-J-PA14A-R03-S09	PPS cabinet, PA14A (DO620)	Operation	Fails to operate	Yes	- Digital Output Module - This is for SOE (Sequence Of Events) - Ni Impacts
30	1-752-J-PA14A-R03-S10	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	Yes	- Dummy Module No impacts
31	1-752-J-PA14A-R04-S01	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	Yes	- Dummy Module No impacts
32	1-752-J-PA14A-R04-S02	PPS cabinet, PA14A (CI631)	Operation	Fails to operate	No	- Communication Interface Module - Coincidence logic changes to two out of three
33	1-752-J-PA14A-R04-S03	PPS cabinet, PA14A (PM646A)	Operation	Fails to operate	No	- ESF functions with HSL to group controller - Coincidence logic changes to two out of three
34	1-752-J-PA14A-R04-S04	PPS cabinet, PA14A (PM646A)	Operation	Fails to operate	No	- Coincidence logic changes to two out of three
35	1-752-J-PA14A-R04-S05	PPS cabinet, PA14A (PM646A)	Operation	Fails to operate	No	- COM HSL input only - No impacts - Coincidence logic changes to two out of three
36	1-752-J-PA14A-R04-S06	PPS cabinet, PA14A (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three
37	1-752-J-PA14A-R04-S07	PPS cabinet, PA14A (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
38	1-752-J-PA14A-R04-S08	PPS cabinet, PA14A (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
39	1-752-J-PA14A-R04-S09	PPS cabinet, PA14A (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
40	1-752-J-PA14A-R04-S10	PPS cabinet, PA14A (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
41	1-752-J-PA14B-R01-S01	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts

Failure Mode Evaluation of Reactor Trip System (RP) (4/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
42	1-752-J-PA14B-R01-S02	PPS cabinet, PA14B (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three
43	1-752-J-PA14B-R01-S03	PPS cabinet, PA14B (PM646A)	Operation	Fails to operate	No	- Bistable Processor Logic - No impacts - Coincidence logic changes to two out of three
44	1-752-J-PA14B-R01-S04	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
45	1-752-J-PA14B-R01-S05	PPS cabinet, PA14B (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three
46	1-752-J-PA14B-R01-S06	PPS cabinet, PA14B (DI620)	Operation	Fails to operate	No	- Digital Input Module - No impacts - Coincidence logic changes to two out of three
47	1-752-J-PA14B-R01-S07	PPS cabinet, PA14B (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three
48	1-752-J-PA14B-R01-S08	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
49	1-752-J-PA14B-R01-S09	PPS cabinet, PA14B (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
50	1-752-J-PA14B-R01-S10	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
51	1-752-J-PA14B-R02-S01	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
52	1-752-J-PA14B-R02-S02	PPS cabinet, PA14B (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three
53	1-752-J-PA14B-R02-S03	PPS cabinet, PA14B (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three

Failure Mode Evaluation of Reactor Trip System (RP) (5/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
54	1-752-J-PA14B-R02-S04	PPS cabinet, PA14B (PM646A)	Operation	Fails to operate	No	- ESF functions with HSL to group controller - No impacts - Coincidence logic changes to two out of three
55	1-752-J-PA14B-R02-S05	PPS cabinet, PA14B (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three
56	1-752-J-PA14B-R02-S06	PPS cabinet, PA14B (PM646A)	Operation	Fails to operate	No	- COM HSL input only - No impacts - Coincidence logic changes to two out of three
57	1-752-J-PA14B-R02-S07	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
58	1-752-J-PA14B-R02-S08	PPS cabinet, PA14B (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
59	1-752-J-PA14B-R02-S09	PPS cabinet, PA14B (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
60	1-752-J-PA14B-R02-S10	PPS cabinet, PA14B (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
61	1-752-J-PA14B-R03-S01	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
62	1-752-J-PA14B-R03-S02	PPS cabinet, PA14B (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three
63	1-752-J-PA14B-R03-S03	PPS cabinet, PA14B (PM646A)	Operation	Fails to operate	No	- Bistable Processor Logic - No impacts - Coincidence logic changes to two out of three
64	1-752-J-PA14B-R03-S04	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
65	1-752-J-PA14B-R03-S05	PPS cabinet, PA14B (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three

Failure Mode Evaluation of Reactor Trip System (RP) (6/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
66	1-752-J-PA14B-R03-S06	PPS cabinet, PA14B (DI620)	Operation	Fails to operate	No	- Digital Input Module - No impacts - Coincidence logic changes to two out of three
67	1-752-J-PA14B-R03-S07	PPS cabinet, PA14B (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three
68	1-752-J-PA14B-R03-S08	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
69	1-752-J-PA14B-R03-S09	PPS cabinet, PA14B (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
70	1-752-J-PA14B-R03-S10	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
71	1-752-J-PA14B-R04-S01	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
72	1-752-J-PA14B-R04-S02	PPS cabinet, PA14B (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three
73	1-752-J-PA14B-R04-S03	PPS cabinet, PA14B (PM646A)	Operation	Fails to operate	No	- ESF functions with HSL to group controller - No impacts - Coincidence logic changes to two out of three
74	1-752-J-PA14B-R04-S04	PPS cabinet, PA14B (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three
75	1-752-J-PA14B-R04-S05	PPS cabinet, PA14B (PM646A)	Operation	Fails to operate	No	- COM HSL input only - No impacts - Coincidence logic changes to two out of three
76	1-752-J-PA14B-R04-S06	PPS cabinet, PA14B (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three
77	1-752-J-PA14B-R04-S07	PPS cabinet, PA14B (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts

Failure Mode Evaluation of Reactor Trip System (RP) (7/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
78	1-752-J-PA14B-R04-S08	PPS cabinet, PA14B (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
79	1-752-J-PA14B-R04-S09	PPS cabinet, PA14B (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
80	1-752-J-PA14B-R04-S10	PPS cabinet, PA14B (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
81	1-752-J-PA14C-R01-S01	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
82	1-752-J-PA14C-R01-S02	PPS cabinet, PA14C (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three
83	1-752-J-PA14C-R01-S03	PPS cabinet, PA14C (PM646A)	Operation	Fails to operate	No	- Bistable Processor Logic - No impacts - Coincidence logic changes to two out of three
84	1-752-J-PA14C-R01-S04	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
85	1-752-J-PA14C-R01-S05	PPS cabinet, PA14C (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three
86	1-752-J-PA14C-R01-S06	PPS cabinet, PA14C (DI620)	Operation	Fails to operate	No	- Digital Input Module - No impacts - Coincidence logic changes to two out of three
87	1-752-J-PA14C-R01-S07	PPS cabinet, PA14C (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three
88	1-752-J-PA14C-R01-S08	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
89	1-752-J-PA14C-R01-S09	PPS cabinet, PA14C (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)

Failure Mode Evaluation of Reactor Trip System (RP) (8/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
90	1-752-J-PA14C-R01-S10	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
91	1-752-J-PA14C-R02-S01	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
92	1-752-J-PA14C-R02-S02	PPS cabinet, PA14C (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three
93	1-752-J-PA14C-R02-S03	PPS cabinet, PA14C (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three
94	1-752-J-PA14C-R02-S04	PPS cabinet, PA14C (PM646A)	Operation	Fails to operate	No	- ESF functions with HSL to group controller - No impacts - Coincidence logic changes to two out of three
95	1-752-J-PA14C-R02-S05	PPS cabinet, PA14C (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three
96	1-752-J-PA14C-R02-S06	PPS cabinet, PA14C (PM646A)	Operation	Fails to operate	No	- COM HSL input only - No impacts - Coincidence logic changes to two out of three
97	1-752-J-PA14C-R02-S07	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
98	1-752-J-PA14C-R02-S08	PPS cabinet, PA14C (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
99	1-752-J-PA14C-R02-S09	PPS cabinet, PA14C (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
100	1-752-J-PA14C-R02-S10	PPS cabinet, PA14C (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
101	1-752-J-PA14C-R03-S01	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
102	1-752-J-PA14C-R03-S02	PPS cabinet, PA14C (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three

Failure Mode Evaluation of Reactor Trip System (RP) (9/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
103	1-752-J-PA14C-R03-S03	PPS cabinet, PA14C (PM646A)	Operation	Fails to operate	No	- Bistable Processor Logic - No impacts - Coincidence logic changes to two out of three
104	1-752-J-PA14C-R03-S04	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
105	1-752-J-PA14C-R03-S05	PPS cabinet, PA14C (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three
106	1-752-J-PA14C-R03-S06	PPS cabinet, PA14C (DI620)	Operation	Fails to operate	No	- Digital Input Module - No impacts - Coincidence logic changes to two out of three
107	1-752-J-PA14C-R03-S07	PPS cabinet, PA14C (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three
108	1-752-J-PA14C-R03-S08	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
109	1-752-J-PA14C-R03-S09	PPS cabinet, PA14C (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
110	1-752-J-PA14C-R03-S10	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
111	1-752-J-PA14C-R04-S01	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
112	1-752-J-PA14C-R04-S02	PPS cabinet, PA14C (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three
113	1-752-J-PA14C-R04-S03	PPS cabinet, PA14C (PM646A)	Operation	Fails to operate	No	- ESF functions with HSL to group controller - No impacts - Coincidence logic changes to two out of three
114	1-752-J-PA14C-R04-S04	PPS cabinet, PA14C (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three
115	1-752-J-PA14C-R04-S05	PPS cabinet, PA14C (PM646A)	Operation	Fails to operate	No	- COM HSL input only - No impacts - Coincidence logic changes to two out of three

Failure Mode Evaluation of Reactor Trip System (RP) (10/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
116	1-752-J-PA14C-R04-S06	PPS cabinet, PA14C (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three
117	1-752-J-PA14C-R04-S07	PPS cabinet, PA14C (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
118	1-752-J-PA14C-R04-S08	PPS cabinet, PA14C (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
119	1-752-J-PA14C-R04-S09	PPS cabinet, PA14C (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
120	1-752-J-PA14C-R04-S10	PPS cabinet, PA14C (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
121	1-752-J-PA14D-R01-S01	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
122	1-752-J-PA14D-R01-S02	PPS cabinet, PA14D (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three
123	1-752-J-PA14D-R01-S03	PPS cabinet, PA14D (PM646A)	Operation	Fails to operate	No	- Bistable Processor Logic - No impacts - Coincidence logic changes to two out of three
124	1-752-J-PA14D-R01-S04	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
125	1-752-J-PA14D-R01-S05	PPS cabinet, PA14D (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three
126	1-752-J-PA14D-R01-S06	PPS cabinet, PA14D (DI620)	Operation	Fails to operate	No	- Digital Input Module - No impacts - Coincidence logic changes to two out of three
127	1-752-J-PA14D-R01-S07	PPS cabinet, PA14D (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three
128	1-752-J-PA14D-R01-S08	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts

Failure Mode Evaluation of Reactor Trip System (RP) (11/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
129	1-752-J-PA14D-R01-S09	PPS cabinet, PA14D (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
130	1-752-J-PA14D-R01-S10	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
131	1-752-J-PA14D-R02-S01	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
132	1-752-J-PA14D-R02-S02	PPS cabinet, PA14D (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three
133	1-752-J-PA14D-R02-S03	PPS cabinet, PA14D (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three
134	1-752-J-PA14D-R02-S04	PPS cabinet, PA14D (PM646A)	Operation	Fails to operate	No	- ESF functions with HSL to group controller - No impacts - Coincidence logic changes to two out of three
135	1-752-J-PA14D-R02-S05	PPS cabinet, PA14D (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three
136	1-752-J-PA14D-R02-S06	PPS cabinet, PA14D (PM646A)	Operation	Fails to operate	No	- COM HSL input only - No impacts - Coincidence logic changes to two out of three
137	1-752-J-PA14D-R02-S07	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
138	1-752-J-PA14D-R02-S08	PPS cabinet, PA14D (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
139	1-752-J-PA14D-R02-S09	PPS cabinet, PA14D (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
140	1-752-J-PA14D-R02-S10	PPS cabinet, PA14D (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
141	1-752-J-PA14D-R03-S01	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts

Failure Mode Evaluation of Reactor Trip System (RP) (12/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
142	1-752-J-PA14D-R03-S02	PPS cabinet, PA14D (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three
143	1-752-J-PA14D-R03-S03	PPS cabinet, PA14D (PM646A)	Operation	Fails to operate	No	- Bistable Processor Logic - No impacts - Coincidence logic changes to two out of three
144	1-752-J-PA14D-R03-S04	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
145	1-752-J-PA14D-R03-S05	PPS cabinet, PA14D (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three
146	1-752-J-PA14D-R03-S06	PPS cabinet, PA14D (DI620)	Operation	Fails to operate	No	- Digital Input Module - No impacts - Coincidence logic changes to two out of three
147	1-752-J-PA14D-R03-S07	PPS cabinet, PA14D (AI688)	Operation	Fails to operate	No	- Analog Input Module - No impacts - Coincidence logic changes to two out of three
148	1-752-J-PA14D-R03-S08	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
149	1-752-J-PA14D-R03-S09	PPS cabinet, PA14D (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
150	1-752-J-PA14D-R03-S10	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
151	1-752-J-PA14D-R04-S01	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
152	1-752-J-PA14D-R04-S02	PPS cabinet, PA14D (CI631)	Operation	Fails to operate	No	- Communication Interface Module - No impacts - Coincidence logic changes to two out of three
153	1-752-J-PA14D-R04-S03	PPS cabinet, PA14D (PM646A)	Operation	Fails to operate	No	- ESF functions with HSL to group controller - No impacts - Coincidence logic changes to two out of three
154	1-752-J-PA14D-R04-S04	PPS cabinet, PA14D (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three

Failure Mode Evaluation of Reactor Trip System (RP) (13/13)

No.	Component ID	Component Description	Normal Status	Failure Mode	Screening	Function
155	1-752-J-PA14D-R04-S05	PPS cabinet, PA14D (PM646A)	Operation	Fails to operate	No	- COM HSL input only - No impacts - Coincidence logic changes to two out of three
156	1-752-J-PA14D-R04-S06	PPS cabinet, PA14D (PM646A)	Operation	Fails to operate	No	- RT digital output - No impacts - Coincidence logic changes to two out of three
157	1-752-J-PA14D-R04-S07	PPS cabinet, PA14D (RB601)	Operation	Fails to operate	No	- Dummy Module - No impacts
158	1-752-J-PA14D-R04-S08	PPS cabinet, PA14D (DO620)	Operation	Fails to operate	No	- Digital Output Module - No impacts - This is for SOE (Sequence Of Events)
159	1-752-J-PA14D-R04-S09	PPS cabinet, PA14D (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three
160	1-752-J-PA14D-R04-S10	PPS cabinet, PA14D (DO630)	Operation	Fails to operate	No	- Digital Output Module - No impacts - Coincidence logic changes to two out of three

Failure Mode Evaluation of Engineered Safety Features Actuation System (EF)

No.	Component ID						Component Type			Component Description			Normal	Failure Mode	Screening	Remark
Group Controller – A1																
DUMMY	C131	P646	P646	P646	P646	P646	D101	D100	DUMY							
1	1-752-J-PA03A-R01-S01						N/A			Dummy at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03A			Operation	Fails to operate	Yes	- Dummy Module - No impacts
2	1-752-J-PA03A-R01-S02						CI Interface Processor			Component Interface Module (CI631) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03A			Operation	Fails to operate	Yes	- Component Interface Module - It causes the loss of ability to communication by AF1000 Internet network. - It impacts on when the coincidence failure of GC-2 CI631. - Redundant group controller has its own CI module which provides global memory and provides AF 100 access.
3	1-752-J-PA03A-R01-S03						Processor Module			PM Processor Module 1 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03A			Operation	Fails to operate	No	- Group Controller 1 Processor Module 1 (GC-1 PM1). - It causes the loss of the A and C ESF Initiation signals. - It causes the loss of the (A or C) coincidence logic performed by PM1. - Redundant component control signal is available in the redundant group controller.
4	1-752-J-PA03A-R01-S04						Processor Module			PM Processor Module 2 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03A			Operation	Fails to operate	No	- Group Controller 1 Processor Module 2 (GC-1 PM2). - It causes the loss of the B and D ESF Initiation signals. - It causes the loss of the (B or D) coincidence logic performed by PM2. - Redundant component control signal is available in the redundant group controller.

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark
5	1-752-J-PA03A-R01-S05	Processor Module	PM Processor Module 3 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 3 (GC-1 PM3). - It causes the loss of the selective two out of four coincidence logic performed by PM 3. - It causes the loss of MCR CPM signals. - Redundant component control signal is available in the redundant group controller.
6	1-752-J-PA03A-R01-S06	Processor Module	PM Processor Module 4 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 4 (GC-1 PM4). - It causes the loss of RSR CPM signals. - Redundant RSR CPM signal is available in the redundant group controller.
7	1-752-J-PA03A-R01-S07	Processor Module	PM Processor Module 5 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 5 (GC-1 PM5). - It causes the loss of component control signal propagation (ESCM signals and MI signals) from CCG to LC via PM5. - Redundant RSR CPM signal is available in the redundant group controller.
8	1-752-J-PA03A-R01-S08	Digital Input Module	Digital Input Module (DI621) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Digital Input Module - It is no impact on the safety function. - It causes the loss of local manual actuation in one GC in that channel, but the redundant GC is still functional. - Redundant group controller and redundant initiation signals are provided within the channel.
9	1-752-J-PA03A-R01-S09	Digital Output Module	Digital Output Module (DO620) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Digital Output Module - It is no impact on the safety function. - It causes the loss of transmission the Transfer Switch status to the PPS.
10	1-752-J-PA03A-R01-S10	N/A	Dummy at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Dummy Module - No impacts

No.	Component ID			Component Type		Component Description					Normal	Failure Mode	Screening	Remark	
CCG – A1															
D U M M Y	C I M 6 3 1	P M 6 4 6	D U M M Y	D U M M Y	D I O 6 2 1	D O 6 2 0	D U M M Y	D U M M Y	C I 6 3 1						
11	1-752-J-PA03A-R02-S01				N/A		Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A				Operation	Fails to operate	Yes	-Dummy Module -No impacts	
12	1-752-J-PA03A-R02-S02				CI Interface Processor		Component Interface Module (CI631) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03A				Operation	Fails to operate	Yes	-Component Interface Module -It impacts on when the coincidence failure of redundant CI631 module in CCG2 -It impacts on corresponding channel's ESCM control manual control	
13	1-752-J-PA03A-R02-S03				Processor Module		PM Processor Module 1 (PM646A) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03A				Operation	Fails to operate	Yes	-Control Channel Gateway 1 Processor Module (CCG-1 PM) -It impact on when the coincidence failure of CCG-2 PM -It impacts corresponding channel's ESCM control	
14	1-752-J-PA03A-R02-S04				N/A		Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A				Operation	Fails to operate	Yes	-Dummy Module -No impacts	
15	1-752-J-PA03A-R02-S05				N/A		Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A				Operation	Fails to operate	Yes	-Dummy Module -No impacts	
16	1-752-J-PA03A-R02-S06				Digital Input Module		Digital Input Module (DI621) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03A				Operation	Fails to operate	Yes	-Digital Input Module -No impact, because no safety function depends on DI contact input. -It is for transfer switch status	
17	1-752-J-PA03A-R02-S07				Digital Output Module		Digital Output Module (DO620) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03A				Operation	Fails to operate	Yes	-Digital Output Module -No impact, because no safety function depends on DO contact input. -It is for transfer switch status	
18	1-752-J-PA03A-R02-S08				N/A		Dummy at CCG 1 in ESF-CCS Group Controller Cabinet, PA03A				Operation	Fails to operate	Yes	-Dummy Module -No impacts	
19	1-752-J-PA03A-R02-S09				N/A		Dummy at CCG 1 in ESF-CCS Group Controller Cabinet, PA03A				Operation	Fails to operate	Yes	-Dummy Module -No impacts	

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark
20	1-752-J-PA03A-R02-S10	CI Interface Processor	Component Interface Module (CI631) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Communication Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG2 - It impacts on corresponding channel's ESCM control manual control
Group Controller – A2							
	D U M M Y C I M M M M M 6 6 6 6 6 6 3 4 4 4 4 4 1 6 6 6 6 6						
21	1-752-J-PA03A-R03-S01	N/A	Group Controller (RB601) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Dummy Module - No impacts
22	1-752-J-PA03A-R03-S02	CI Interface Processor	Component Interface Module (CI631) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Component Interface Module - It causes the loss of ability to communication by AF1000 Internet network. - It impacts on when the coincidence failure of GC-1 CI631. - Redundant group controller has its own CI module which provides global memory and provides AF 100 access.
23	1-752-J-PA03A-R03-S03	Processor Module	PM Processor Module 1 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 1 (GC-2 PM1). - It causes the loss of the A and C ESF Initiation signals. - It causes the loss of the (A or C) coincidence logic performed by PM1. - Redundant component control signal is available in the redundant group controller.
24	1-752-J-PA03A-R03-S04	Processor Module	PM Processor Module 2 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 2 (GC-2 PM2). - It causes the loss of the B and D ESF Initiation signals. - It causes the loss of the (B or D) coincidence logic performed by PM2. - Redundant component control signal is available in the redundant group controller.

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark
25	1-752-J-PA03A-R03-S05	Processor Module	PM Processor Module 3 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 3 (GC-2 PM3). - It causes the loss of the selective two out of four coincidence logic performed by PM 3. - It causes the loss of MCR CPM signals. - Redundant component control signal is available in the redundant group controller.
26	1-752-J-PA03A-R03-S06	Processor Module	PM Processor Module 4 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 4 (GC-2 PM4). - It causes the loss of RSR CPM signals. - Redundant RSR CPM signal is available in the redundant group controller.
27	1-752-J-PA03A-R03-S07	Processor Module	PM Processor Module 5 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 5 (GC-2 PM5). - It causes the loss of component control signal propagation (ESCM signals and MI signals) from CCG to LC via PM5. - Redundant RSR CPM signal is available in the redundant group controller.
28	1-752-J-PA03A-R03-S08	Digital Input Module	Digital Input Module (DI621) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Digital Input Module - It is no impact on the safety function. - It causes the loss of local manual actuation in one GC in that channel, but the redundant GC is still functional. - Redundant group controller and redundant initiation signals are provided within the channel.
29	1-752-J-PA03A-R03-S09	Digital Output Module	Digital Output Module (DO620) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Digital Output Module - It is no impact on the safety function. - It causes the loss of transmission the Transfer Switch status to the PPS.
30	1-752-J-PA03A-R03-S10	N/A	ESF-CCS group controller cabinet, PA03A (RB601)	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Dummy Module - No impacts

No.	Component ID			Component Type		Component Description			Normal	Failure Mode	Screening	Remark	
CCG – A2													
DUMMY	C631	PM646	DUMMY	DUMMY	DI621	DO620	DUMMY	DUMMY	C631				
31	1-752-J-PA03A-R04-S01			N/A		Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03A			Operation	Fails to operate	Yes	- Dummy Module - No impacts	
32	1-752-J-PA03A-R04-S02			CI Interface Processor		Component Interface Module (CI631) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03A			Operation	Fails to operate	Yes	- Component Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG1. - It impacts on corresponding channel's ESCM control manual control.	
33	1-752-J-PA03A-R04-S03			Processor Module		PM Processor Module 1 (PM646A) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03A			Operation	Fails to operate	Yes	- Control Channel Gateway 1 Processor Module (CCG-2 PM) - It impact on when the coincidence failure of CCG-1 PM - It impacts corresponding channel's ESCM control	
34	1-752-J-PA03A-R04-S04			N/A		ESF-CCS group controller cabinet, PA03A (RB601)			Operation	Fails to operate	Yes	- Dummy Module - No impacts	
35	1-752-J-PA03A-R04-S05			N/A		ESF-CCS group controller cabinet, PA03A (RB601)			Operation	Fails to operate	Yes	- Dummy Module - No impacts	
36	1-752-J-PA03A-R04-S06			Digital Input Module		Digital Input Module (DI621) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03A			Operation	Fails to operate	Yes	- Digital Input Module - No impact, because no safety function depends on DI contact input. - It is for transfer switch status	
37	1-752-J-PA03A-R04-S07			Digital Output Module		Digital Output Module (DO620) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03A			Operation	Fails to operate	Yes	- Digital Output Module - No impact, because no safety function depends on DO contact input. - It is for transfer switch status	
38	1-752-J-PA03A-R04-S08			N/A		ESF-CCS group controller cabinet, PA03A (RB601)			Operation	Fails to operate	Yes	- Dummy Module - No impacts	
39	1-752-J-PA03A-R04-S09			N/A		ESF-CCS group controller cabinet, PA03A (RB601)			Operation	Fails to operate	Yes	- Dummy Module - No impacts	
40	1-752-J-PA03A-R04-S10			CI Interface Processor		Component Interface Module (CI631) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03A			Operation	Fails to operate	Yes	- Communication Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG1. - It impacts on corresponding channel's ESCM control manual control	

No.	Component ID						Component Type		Component Description		Normal	Failure Mode	Screening	Remark
Group Controller – A3														
C I 6 3 1	C I 6 3 1	P M 6 4 6	P M 6 4 6	D I 6 2 1	D O 6 2 0	D U M M Y	D U M M Y	D U M M Y	C I 6 3 1					
41	1-752-J-PA03A-R05-S01						CI Interface Processor		Component Interface Module (CI631) 1 at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03A		Operation	Fails to operate	Yes	- Component Interface Module - It causes the loss global memory. - Redundant CI module provides redundant global memory for the chassis.
42	1-752-J-PA03A-R05-S02						CI Interface Processor		Component Interface Module (CI631) 2 at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03A		Operation	Fails to operate	Yes	- Component Interface Module - It causes the loss global memory. - Redundant CI module provides redundant global memory for the chassis.
43	1-752-J-PA03A-R05-S03						Processor Module		PM Processor Module 1 (PM646A) at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03A		Operation	Fails to operate	No	- Primary Processor Module - It causes the loss of Actuation of BOP ESF or Load Sequencing. - Redundant GC-3 secondary processor module provides the logic for actuation of BOP ESF and Load Sequencing. - The redundant PM acquires the RMS and Loss of Offsite Power (LOOP) input signals, performs the BOP ESF and Load Sequencing Logic and transmits the corresponding initiation signals.
44	1-752-J-PA03A-R05-S04						Processor Module		PM Processor Module 1 (PM646A) at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03A		Operation	Fails to operate	No	- Secondary Processor Module - It causes the loss of Actuation of BOP ESF or Load Sequencing. - Redundant GC-3 secondary processor module provides the logic for actuation of BOP ESF and Load Sequencing. - The redundant PM acquires the RMS and Loss of Offsite Power (LOOP) input signals, performs the BOP ESF and Load Sequencing Logic and transmits the corresponding initiation signals.
45	1-752-J-PA03A-R05-S05						Digital Input Module		Digital Input Module (DI621) at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03A		Operation	Fails to operate	No	- Digital Input Module - It causes the loss of internal cabinet status information, and it causes the loss of Actuation of BOP ESF or Load Sequencing. - Redundant GC-3's are provided by ESF-CCS Channels A and B, thus the redundant GC-3 maintains the function.

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark																																																				
46	1-752-J-PA03A-R05-S06	Digital Output Module	Digital Output Module (DO620) at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	No	- Digital Output Module - It causes the loss of internal cabinet status information, and it causes the loss of Actuation of BOP ESF or Load Sequencing. - Redundant GC-3's are provided by ESF-CCS Channels A and B, thus the redundant GC-3 maintains the function.																																																				
47	1-752-J-PA03A-R05-S07	N/A	ESF-CCS group controller cabinet, PA03A (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts																																																				
48	1-752-J-PA03A-R05-S08	N/A	ESF-CCS group controller cabinet, PA03A (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts																																																				
49	1-752-J-PA03A-R05-S09	N/A	ESF-CCS group controller cabinet, PA03A (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts																																																				
50	1-752-J-PA03A-R05-S10	CI Interface Processor	Component Interface Module (CI631) 3 at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03A	Operation	Fails to operate	Yes	- Component Interface Module - It causes the loss of ability to communication by AF1000 Internet network. - It impacts on the actuation of BOP-ESF and load sequencing. - Redundant GC-3's are provided by ESF-CCS channel A and B, thus the redundant GC-3 maintains the function.																																																				
<div>Group Controller – A1</div> <table><tr><td>D</td><td>C</td><td>P</td><td>P</td><td>P</td><td>P</td><td>P</td><td>D</td><td>D</td><td>D</td></tr><tr><td>U</td><td>I</td><td>M</td><td>M</td><td>M</td><td>M</td><td>M</td><td>I</td><td>O</td><td>U</td></tr><tr><td>M</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>M</td></tr><tr><td>M</td><td>3</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>2</td><td>2</td><td>M</td></tr><tr><td>Y</td><td>1</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>1</td><td>0</td><td>Y</td></tr></table>										D	C	P	P	P	P	P	D	D	D	U	I	M	M	M	M	M	I	O	U	M	6	6	6	6	6	6	6	6	M	M	3	4	4	4	4	4	2	2	M	Y	1	6	6	6	6	6	1	0	Y
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Y	1	6	6	6	6	6	1	0	Y																																																		
51	1-752-J-PA03B-R01-S01	N/A	Dummy at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Dummy Module - No impacts																																																				
52	1-752-J-PA03B-R01-S02	CI Interface Processor	Component Interface Module (CI631) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Component Interface Module - It causes the loss of ability to communication by AF1000 Internet network. - It impacts on when the coincidence failure of GC-2 CI631. Redundant group controller has its own CI module which provides global memory and provides AF 100 access.																																																				

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	-Remark
53	1-752-J-PA03B-R01-S03	Processor Module	PM Processor Module 1 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 1 (GC-1 PM1). - It causes the loss of the A and C ESF Initiation signals. - It causes the loss of the (A or C) coincidence logic performed by PM1. - Redundant component control signal is available in the redundant group controller.
54	1-752-J-PA03B-R01-S04	Processor Module	PM Processor Module 2 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 2 (GC-1 PM2). - It causes the loss of the B and D ESF Initiation signals. - It causes the loss of the (B or D) coincidence logic performed by PM2. - Redundant component control signal is available in the redundant group controller.
55	1-752-J-PA03B-R01-S05	Processor Module	PM Processor Module 3 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 3 (GC-1 PM3). - It causes the loss of the selective two out of four coincidence logic performed by PM 3. - It causes the loss of MCR CPM signals. - Redundant component control signal is available in the redundant group controller.
56	1-752-J-PA03B-R01-S06	Processor Module	PM Processor Module 4 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 4 (GC-1 PM4). - It causes the loss of RSR CPM signals. - Redundant RSR CPM signal is available in the redundant group controller.
57	1-752-J-PA03B-R01-S07	Processor Module	PM Processor Module 5 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 5 (GC-1 PM5). - It causes the loss of component control signal propagation (ESCM signals and MI signals) from CCG to LC via PM5. - Redundant RSR CPM signal is available in the redundant group controller.

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark		
58	1-752-J-PA03B-R01-S08	Digital Input Module	Digital Input Module (DI621) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Digital Input Module - It is no impact on the safety function. - It causes the loss of local manual actuation in one GC in that channel, but the redundant GC is still functional. - Redundant group controller and redundant initiation signals are provided within the channel.		
59	1-752-J-PA03B-R01-S09	Digital Output Module	Digital Output Module (DO620) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Digital Output Module - It is no impact on the safety function. - It causes the loss of transmission the Transfer Switch status to the PPS.		
60	1-752-J-PA03B-R01-S10	N/A	Dummy at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Dummy Module - No impacts		
CCG – A1									
D U M M Y	C I M 6 3 4 1	P M 6 6 4 6	D U M M Y	D U M M Y	D I 6 6 2 1	D O 6 6 2 0	D U M M Y	D U M M Y	C I 6 3 1
61	1-752-J-PA03B-R02-S01	N/A	Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Dummy Module - No impacts		
62	1-752-J-PA03B-R02-S02	CI Interface Processor	Component Interface Module (CI631) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Component Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG2 - It impacts on corresponding channel's ESCM control manual control		
63	1-752-J-PA03B-R02-S03	Processor Module	PM Processor Module 1 (PM646A) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Control Channel Gateway 1 Processor Module (CCG-1 PM) - It impact on when the coincidence failure of CCG-2 PM - It impacts corresponding channel's ESCM control		
64	1-752-J-PA03B-R02-S04	N/A	Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Dummy Module - No impacts		
65	1-752-J-PA03B-R02-S05	N/A	Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Dummy Module - No impacts		

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark																																																														
66	1-752-J-PA03B-R02-S06	Digital Input Module	Digital Input Module (DI621) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Digital Input Module - No impact, because no safety function depends on DI contact input. - It is for transfer switch status																																																														
67	1-752-J-PA03B-R02-S07	Digital Output Module	Digital Output Module (DO620) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Digital Output Module - No impact, because no safety function depends on DO contact input. - It is for transfer switch status																																																														
68	1-752-J-PA03B-R02-S08	N/A	Dummy at CCG 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Dummy Module - No impacts																																																														
69	1-752-J-PA03B-R02-S09	N/A	Dummy at CCG 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Dummy Module - No impacts																																																														
70	1-752-J-PA03B-R02-S10	CI Interface Processor	Component Interface Module (CI631) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Communication Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG2 - It impacts on corresponding channel's ESCM control manual control																																																														
<table><tr><td colspan="10">Group Controller – A2</td></tr><tr><td>D</td><td>C</td><td>P</td><td>P</td><td>P</td><td>P</td><td>P</td><td>D</td><td>D</td><td>D</td></tr><tr><td>U</td><td>I</td><td>M</td><td>M</td><td>M</td><td>M</td><td>M</td><td>I</td><td>O</td><td>U</td></tr><tr><td>M</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>M</td></tr><tr><td>M</td><td>3</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>2</td><td>2</td><td>M</td></tr><tr><td>Y</td><td>1</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>1</td><td>0</td><td>Y</td></tr></table>										Group Controller – A2										D	C	P	P	P	P	P	D	D	D	U	I	M	M	M	M	M	I	O	U	M	6	6	6	6	6	6	6	6	M	M	3	4	4	4	4	4	2	2	M	Y	1	6	6	6	6	6	1	0	Y
Group Controller – A2																																																																					
D	C	P	P	P	P	P	D	D	D																																																												
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M	3	4	4	4	4	4	2	2	M																																																												
Y	1	6	6	6	6	6	1	0	Y																																																												
71	1-752-J-PA03B-R03-S01	N/A	Group Controller (RB601) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Dummy Module - No impacts																																																														
72	1-752-J-PA03B-R03-S02	CI Interface Processor	Component Interface Module (CI631) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Component Interface Module - It causes the loss of ability to communication by AF1000 Internet network. - It impacts on when the coincidence failure of GC-1 CI631. - Redundant group controller has its own CI module which provides global memory and provides AF 100 access.																																																														

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark
73	1-752-J-PA03B-R03-S03	Processor Module	PM Processor Module 1 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 1 (GC-2 PM1). - It causes the loss of the A and C ESF Initiation signals. - It causes the loss of the (A or C) coincidence logic performed by PM1. - Redundant component control signal is available in the redundant group controller.
74	1-752-J-PA03B-R03-S04	Processor Module	PM Processor Module 2 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 2 (GC-2 PM2). - It causes the loss of the B and D ESF Initiation signals. - It causes the loss of the (B or D) coincidence logic performed by PM2. - Redundant component control signal is available in the redundant group controller.
75	1-752-J-PA03B-R03-S05	Processor Module	PM Processor Module 3 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 3 (GC-2 PM3). - It causes the loss of the selective two out of four coincidence logic performed by PM 3. - It causes the loss of MCR CPM signals. - Redundant component control signal is available in the redundant group controller.
76	1-752-J-PA03B-R03-S06	Processor Module	PM Processor Module 4 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 4 (GC-2 PM4). - It causes the loss of RSR CPM signals. - Redundant RSR CPM signal is available in the redundant group controller.
77	1-752-J-PA03B-R03-S07	Processor Module	PM Processor Module 5 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 5 (GC-2 PM5). - It causes the loss of component control signal propagation (ESCM signals and MI signals) from CCG to LC via PM5. - Redundant RSR CPM signal is available in the redundant group controller.
78	1-752-J-PA03B-R03-S08	Digital Input Module	Digital Input Module (DI621) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Digital Input Module - It is no impact on the safety function. - It causes the loss of local manual actuation in one GC in that channel, but the redundant GC is still functional. - Redundant group controller and redundant initiation signals are provided within the channel.

No.	Component ID		Component Type	Component Description			Normal	Failure Mode	Screening	Remark
79	1-752-J-PA03B-R03-S09		Digital Output Module	Digital Output Module (DO620) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B			Operation	Fails to operate	Yes	- Digital Output Module - It is no impact on the safety function. - It causes the loss of transmission the Transfer Switch status to the PPS.
80	1-752-J-PA03B-R03-S10		N/A	ESF-CCS group controller cabinet, PA03B (RB601)			Operation	Fails to operate	Yes	- Dummy Module - No impacts
CCG – A2										
	D U M M Y	C I M 3 1	P M 6 4 6	D U M M Y	D U M M Y	D I O 2 2 0	D U M M Y	D U M M Y	C I 6 3 1	
81	1-752-J-PA03B-R04-S01		N/A	Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03B			Operation	Fails to operate	Yes	- Dummy Module - No impacts
82	1-752-J-PA03B-R04-S02		CI Interface Processor	Component Interface Module (CI631) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03B			Operation	Fails to operate	Yes	- Component Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG1. - It impacts on corresponding channel's ESCM control manual control.
83	1-752-J-PA03B-R04-S03		Processor Module	PM Processor Module 1 (PM646A) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03B			Operation	Fails to operate	Yes	- Control Channel Gateway 1 Processor Module (CCG-2 PM) - It impact on when the coincidence failure of CCG-1 PM - It impacts corresponding channel's ESCM control
84	1-752-J-PA03B-R04-S04		N/A	ESF-CCS group controller cabinet, PA03B (RB601)			Operation	Fails to operate	Yes	- Dummy Module - No impacts
85	1-752-J-PA03B-R04-S05		N/A	ESF-CCS group controller cabinet, PA03B (RB601)			Operation	Fails to operate	Yes	- Dummy Module - No impacts
86	1-752-J-PA03B-R04-S06		Digital Input Module	Digital Input Module (DI621) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03B			Operation	Fails to operate	Yes	- Digital Input Module - No impact, because no safety function depends on DI contact input. - It is for transfer switch status
87	1-752-J-PA03B-R04-S07		Digital Output Module	Digital Output Module (DO620) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03B			Operation	Fails to operate	Yes	- Digital Output Module - No impact, because no safety function depends on DO contact input. - It is for transfer switch status

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark																																																				
88	1-752-J-PA03B-R04-S08	N/A	ESF-CCS group controller cabinet, PA03B (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts																																																				
89	1-752-J-PA03B-R04-S09	N/A	ESF-CCS group controller cabinet, PA03B (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts																																																				
90	1-752-J-PA03B-R04-S10	CI Interface Processor	Component Interface Module (CI631) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Communication Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG1. - It impacts on corresponding channel's ESCM control manual control																																																				
<div><div>Group Controller – A3</div><table><tr><td>C</td><td>C</td><td>P</td><td>P</td><td>D</td><td>D</td><td>D</td><td>D</td><td>D</td><td>C</td></tr><tr><td>I</td><td>I</td><td>M</td><td>M</td><td>I</td><td>O</td><td>U</td><td>U</td><td>U</td><td>I</td></tr><tr><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>M</td><td>M</td><td>M</td><td>6</td></tr><tr><td>3</td><td>3</td><td>4</td><td>4</td><td>2</td><td>2</td><td>M</td><td>M</td><td>M</td><td>3</td></tr><tr><td>1</td><td>1</td><td>6</td><td>6</td><td>1</td><td>0</td><td>Y</td><td>Y</td><td>Y</td><td>1</td></tr></table></div>										C	C	P	P	D	D	D	D	D	C	I	I	M	M	I	O	U	U	U	I	6	6	6	6	6	6	M	M	M	6	3	3	4	4	2	2	M	M	M	3	1	1	6	6	1	0	Y	Y	Y	1
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3	3	4	4	2	2	M	M	M	3																																																		
1	1	6	6	1	0	Y	Y	Y	1																																																		
91	1-752-J-PA03B-R05-S01	CI Interface Processor	Component Interface Module (CI631) 1 at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Component Interface Module - It causes the loss global memory. - Redundant CI module provides redundant global memory for the chassis.																																																				
92	1-752-J-PA03B-R05-S02	CI Interface Processor	Component Interface Module (CI631) 2 at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	- Component Interface Module - It causes the loss global memory. - Redundant CI module provides redundant global memory for the chassis.																																																				
93	1-752-J-PA03B-R05-S03	Processor Module	PM Processor Module 1 (PM646A) at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	- Primary Processor Module - It causes the loss of Actuation of BOP ESF or Load Sequencing. - Redundant GC-3 secondary processor module provides the logic for actuation of BOP ESF and Load Sequencing. - The redundant PM acquires the RMS and Loss of Offsite Power (LOOP) input signals, performs the BOP ESF and Load Sequencing Logic and transmits the corresponding initiation signals.																																																				

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark
94	1-752-J-PA03B-R05-S04	Processor Module	PM Processor Module 1 (PM646A) at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Secondary Processor Module - It causes the loss of Actuation of BOP ESF or Load Sequencing. - Redundant GC-3 secondary processor module provides the logic for actuation of BOP ESF and Load Sequencing. - The redundant PM acquires the RMS and Loss of Offsite Power (LOOP) input signals, performs the BOP ESF and Load Sequencing Logic and transmits the corresponding initiation signals.
95	1-752-J-PA03B-R05-S05	Digital Input Module	Digital Input Module (DI621) at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Digital Input Module - It causes the loss of internal cabinet status information, and it causes the loss of Actuation of BOP ESF or Load Sequencing. - Redundant GC-3's are provided by ESF-CCS Channels A and B, thus the redundant GC-3 maintains the function.
96	1-752-J-PA03B-R05-S06	Digital Output Module	Digital Output Module (DO620) at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Digital Output Module - It causes the loss of internal cabinet status information, and it causes the loss of Actuation of BOP ESF or Load Sequencing. - Redundant GC-3's are provided by ESF-CCS Channels A and B, thus the redundant GC-3 maintains the function.
97	1-752-J-PA03B-R05-S07	N/A	ESF-CCS group controller cabinet, PA03B (RB601)	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Dummy Module - No impacts
98	1-752-J-PA03B-R05-S08	N/A	ESF-CCS group controller cabinet, PA03B (RB601)	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Dummy Module - No impacts
99	1-752-J-PA03B-R05-S09	N/A	ESF-CCS group controller cabinet, PA03B (RB601)	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Dummy Module - No impacts
100	1-752-J-PA03B-R05-S10	CI Interface Processor	Component Interface Module (CI631) 3 at Group Controller 3 in ESF-CCS Group Controller Cabinet, PA03B	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Component Interface Module - It causes the loss of ability to communication by AF1000 Internet network. - It impacts on the actuation of BOP-ESF and load sequencing. - Redundant GC-3's are provided by ESF-CCS channel A and B, thus the redundant GC-3 maintains the function.

No.	Component ID							Component Type			Component Description	Normal	Failure Mode	Screening	Remark
Group Controller – A1															
D	C	P	P	P	P	P	D	D	D						
U	I	M	M	M	M	M	I	O	U						
M	6	6	6	6	6	6	6	6	M						
M	3	4	4	4	4	4	2	2	M						
Y	1	6	6	6	6	6	1	0	Y						
101	1-752-J-PA03C-R01-S01							N/A			Dummy at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Dummy Module - No impacts
102	1-752-J-PA03C-R01-S02							CI Interface Processor			Component Interface Module (CI631) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Component Interface Module - It causes the loss of ability to communication by AF1000 Internet network. - It impacts on when the coincidence failure of GC-2 CI631. - Redundant group controller has its own CI module which provides global memory and provides AF 100 access.
103	1-752-J-PA03C-R01-S03							Processor Module			PM Processor Module 1 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	No	- Group Controller 1 Processor Module 1 (GC-1 PM1). - It causes the loss of the A and C ESF Initiation signals. - It causes the loss of the (A or C) coincidence logic performed by PM1. - Redundant component control signal is available in the redundant group controller.
104	1-752-J-PA03C-R01-S04							Processor Module			PM Processor Module 2 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	No	- Group Controller 1 Processor Module 2 (GC-1 PM2). - It causes the loss of the B and D ESF Initiation signals. - It causes the loss of the (B or D) coincidence logic performed by PM2. - Redundant component control signal is available in the redundant group controller.
105	1-752-J-PA03C-R01-S05							Processor Module			PM Processor Module 3 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	No	- Group Controller 1 Processor Module 3 (GC-1 PM3). - It causes the loss of the selective two out of four coincidence logic performed by PM 3. - It causes the loss of MCR CPM signals. - Redundant component control signal is available in the redundant group controller.

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark			
106	1-752-J-PA03C-R01-S06	Processor Module	PM Processor Module 4 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	No	- Group Controller 1 Processor Module 4 (GC-1 PM4). - It causes the loss of RSR CPM signals. - Redundant RSR CPM signal is available in the redundant group controller.			
107	1-752-J-PA03C-R01-S07	Processor Module	PM Processor Module 5 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Group Controller 1 Processor Module 5 (GC-1 PM5). - It causes the loss of component control signal propagation (ESCM signals and MI signals) from CCG to LC via PM5. - Redundant RSR CPM signal is available in the redundant group controller.			
108	1-752-J-PA03C-R01-S08	Digital Input Module	Digital Input Module (DI621) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Digital Input Module - It is no impact on the safety function. - It causes the loss of local manual actuation in one GC in that channel, but the redundant GC is still functional. - Redundant group controller and redundant initiation signals are provided within the channel.			
109	1-752-J-PA03C-R01-S09	Digital Output Module	Digital Output Module (DO620) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Digital Output Module - It is no impact on the safety function. - It causes the loss of transmission the Transfer Switch status to the PPS.			
110	1-752-J-PA03C-R01-S10	N/A	Dummy at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Dummy Module - No impacts			
CCG – A1										
	D U M M Y	C I M 3 Y	P M 6 4 6	D U M M Y	D U M M Y	D I 6 2 1	D O 6 2 0	D U M M Y	D U M M Y	C I 6 3 1
111	1-752-J-PA03C-R02-S01	N/A	Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Dummy Module - No impacts			
112	1-752-J-PA03C-R02-S02	CI Interface Processor	Component Interface Module (CI631) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Component Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG2 - It impacts on corresponding channel's ESCM control manual control			

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark							
113	1-752-J-PA03C-R02-S03	Processor Module	PM Processor Module 1 (PM646A) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Control Channel Gateway 1 Processor Module (CCG-1 PM) - It impact on when the coincidence failure of CCG-2 PM - It impacts corresponding channel's ESCM control							
114	1-752-J-PA03C-R02-S04	N/A	Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Dummy Module - No impacts							
115	1-752-J-PA03C-R02-S05	N/A	Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Dummy Module - No impacts							
116	1-752-J-PA03C-R02-S06	Digital Input Module	Digital Input Module (DI621) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Digital Input Module - No impact, because no safety function depends on DI contact input. - It is for transfer switch status							
117	1-752-J-PA03C-R02-S07	Digital Output Module	Digital Output Module (DO620) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Digital Output Module - No impact, because no safety function depends on DO contact input. - It is for transfer switch status							
118	1-752-J-PA03C-R02-S08	N/A	Dummy at CCG 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Dummy Module - No impacts							
119	1-752-J-PA03C-R02-S09	N/A	Dummy at CCG 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Dummy Module - No impacts							
120	1-752-J-PA03C-R02-S10	CI Interface Processor	Component Interface Module (CI631) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Communication Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG2 - It impacts on corresponding channel's ESCM control manual control							
		Group Controller – A2												
		D U M M Y	C I M M Y	P 6 3 1	P 6 4 6	P 6 4 6	P 6 4 6	D 6 2 1	D 6 2 0	O 6 2 0	U M M Y			
121	1-752-J-PA03C-R03-S01	N/A	Group Controller (RB601) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Dummy Module - No impacts							

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark
122	1-752-J-PA03C-R03-S02	CI Interface Processor	Component Interface Module (CI631) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Component Interface Module - It causes the loss of ability to communication by AF1000 Internet network. - It impacts on when the coincidence failure of GC-1 CI631. - Redundant group controller has its own CI module which provides global memory and provides AF 100 access.
123	1-752-J-PA03C-R03-S03	Processor Module	PM Processor Module 1 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 1 (GC-2 PM1). - It causes the loss of the A and C ESF Initiation signals. - It causes the loss of the (A or C) coincidence logic performed by PM1. - Redundant component control signal is available in the redundant group controller.
124	1-752-J-PA03C-R03-S04	Processor Module	PM Processor Module 2 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 2 (GC-2 PM2). - It causes the loss of the B and D ESF Initiation signals. - It causes the loss of the (B or D) coincidence logic performed by PM2. - Redundant component control signal is available in the redundant group controller.
125	1-752-J-PA03C-R03-S05	Processor Module	PM Processor Module 3 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 3 (GC-2 PM3). - It causes the loss of the selective two out of four coincidence logic performed by PM 3. - It causes the loss of MCR CPM signals. - Redundant component control signal is available in the redundant group controller.
126	1-752-J-PA03C-R03-S06	Processor Module	PM Processor Module 4 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 4 (GC-2 PM4). - It causes the loss of RSR CPM signals. - Redundant RSR CPM signal is available in the redundant group controller.

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark				
127	1-752-J-PA03C-R03-S07	Processor Module	PM Processor Module 5 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Group Controller 1 Processor Module 5 (GC-2 PM5). - It causes the loss of component control signal propagation (ESCM signals and MI signals) from CCG to LC via PM5. - Redundant RSR CPM signal is available in the redundant group controller.				
128	1-752-J-PA03C-R03-S08	Digital Input Module	Digital Input Module (DI621) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Digital Input Module - It is no impact on the safety function. - It causes the loss of local manual actuation in one GC in that channel, but the redundant GC is still functional. - Redundant group controller and redundant initiation signals are provided within the channel.				
129	1-752-J-PA03C-R03-S09	Digital Output Module	Digital Output Module (DO620) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Digital Output Module - It is no impact on the safety function. - It causes the loss of transmission the Transfer Switch status to the PPS.				
130	1-752-J-PA03C-R03-S10	N/A	ESF-CCS group controller cabinet, PA03C(RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts				
		<div><div>CCG – A2</div><div><div>D U M M Y</div><div>C I 6 3 1</div><div>P M 6 4 6</div><div>D U M M Y</div><div>D U M M Y</div><div>D I 6 2 1</div><div>D O 6 2 0</div><div>D U M M Y</div><div>D U M M Y</div><div>C I 6 3 1</div></div></div>									
131	1-752-J-PA03C-R04-S01	N/A	Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Dummy Module - No impacts				
132	1-752-J-PA03C-R04-S02	CI Interface Processor	Component Interface Module (CI631) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Component Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG1. - It impacts on corresponding channel's ESCM control manual control.				
133	1-752-J-PA03C-R04-S03	Processor Module	PM Processor Module 1 (PM646A) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Control Channel Gateway 1 Processor Module (CCG-2 PM) - It impact on when the coincidence failure of CCG-1 PM - It impacts corresponding channel's ESCM control				

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark		
134	1-752-J-PA03C-R04-S04	N/A	ESF-CCS group controller cabinet, PA03C (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts		
135	1-752-J-PA03C-R04-S05	N/A	ESF-CCS group controller cabinet, PA03C (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts		
136	1-752-J-PA03C-R04-S06	Digital Input Module	Digital Input Module (DI621) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Digital Input Module - No impact, because no safety function depends on DI contact input. - It is for transfer switch status		
137	1-752-J-PA03C-R04-S07	Digital Output Module	Digital Output Module (DO620) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Digital Output Module - No impact, because no safety function depends on DO contact input. - It is for transfer switch status		
138	1-752-J-PA03C-R04-S08	N/A	ESF-CCS group controller cabinet, PA03C (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts		
139	1-752-J-PA03C-R04-S09	N/A	ESF-CCS group controller cabinet, PA03C (RB601)	Operation	Fails to operate	Yes	- Dummy Module - No impacts		
140	1-752-J-PA03C-R04-S10	CI Interface Processor	Component Interface Module (CI631) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03C	Operation	Fails to operate	Yes	- Communication Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG1. - It impacts on corresponding channel's ESCM control manual control		
Group Controller – A1									
D U M M Y	C I 3 1	P M 6	P M 6	P M 4	P M 4	P M 6	D I 6 2 1	D O 2 0	D U M Y
141	1-752-J-PA03D-R01-S01	N/A	Dummy at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	Yes	- Dummy Module - No impacts		
142	1-752-J-PA03D-R01-S02	CI Interface Processor	Component Interface Module (CI631) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	Yes	- Component Interface Module - It causes the loss of ability to communication by AF1000 Internet network. - It impacts on when the coincidence failure of GC-2 CI631. - Redundant group controller has its own CI module which provides global memory and provides AF 100 access.		

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark
143	1-752-J-PA03D-R01-S03	Processor Module	PM Processor Module 1 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 1 (GC-1 PM1). - It causes the loss of the A and C ESF Initiation signals. - It causes the loss of the (A or C) coincidence logic performed by PM1. - Redundant component control signal is available in the redundant group controller.
144	1-752-J-PA03D-R01-S04	Processor Module	PM Processor Module 2 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 2 (GC-1 PM2). - It causes the loss of the B and D ESF Initiation signals. - It causes the loss of the (B or D) coincidence logic performed by PM2. - Redundant component control signal is available in the redundant group controller.
145	1-752-J-PA03D-R01-S05	Processor Module	PM Processor Module 3 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 3 (GC-1 PM3). - It causes the loss of the selective two out of four coincidence logic performed by PM 3. - It causes the loss of MCR CPM signals. - Redundant component control signal is available in the redundant group controller.
146	1-752-J-PA03D-R01-S06	Processor Module	PM Processor Module 4 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 4 (GC-1 PM4). - It causes the loss of RSR CPM signals. - Redundant RSR CPM signal is available in the redundant group controller.
147	1-752-J-PA03D-R01-S07	Processor Module	PM Processor Module 5 (PM646A) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 5 (GC-1 PM5). - It causes the loss of component control signal propagation (ESCM signals and MI signals) from CCG to LC via PM5. - Redundant RSR CPM signal is available in the redundant group controller.
148	1-752-J-PA03D-R01-S08	Digital Input Module	Digital Input Module (DI621) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Digital Input Module - It is no impact on the safety function. - It causes the loss of local manual actuation in one GC in that channel, but the redundant GC is still functional. - Redundant group controller and redundant initiation signals are provided within the channel.

No.	Component ID		Component Type	Component Description		Normal	Failure Mode	Screening	Remark	
149	1-752-J-PA03D-R01-S09		Digital Output Module	Digital Output Module (DO620) at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03D		Operation	Fails to operate	Yes	- Digital Output Module - It is no impact on the safety function. - It causes the loss of transmission the Transfer Switch status to the PPS.	
150	1-752-J-PA03D-R01-S10		N/A	Dummy at Group Controller 1 in ESF-CCS Group Controller Cabinet, PA03D		Operation	Fails to operate	Yes	- Dummy Module - No impacts	
CCG – A1										
	D U M M Y	C I M 3 1	P M 6 4 6	D U M M Y	D U M M Y	D I 6 2 0	D O 6 2 0	D U M M Y	D U M M Y	C I 6 3 1
151	1-752-J-PA03D-R02-S01		N/A	Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D		Operation	Fails to operate	Yes	- Dummy Module - No impacts	
152	1-752-J-PA03D-R02-S02		CI Interface Processor	Component Interface Module (CI631) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03D		Operation	Fails to operate	Yes	- Component Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG2 - It impacts on corresponding channel's ESCM control manual control	
153	1-752-J-PA03D-R02-S03		Processor Module	PM Processor Module 1 (PM646A) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03D		Operation	Fails to operate	Yes	- Control Channel Gateway 1 Processor Module (CCG-1 PM) - It impact on when the coincidence failure of CCG-2 PM - It impacts corresponding channel's ESCM control	
154	1-752-J-PA03D-R02-S04		N/A	Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D		Operation	Fails to operate	Yes	- Dummy Module - No impacts	
155	1-752-J-PA03D-R02-S05		N/A	Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D		Operation	Fails to operate	Yes	- Dummy Module - No impacts	
156	1-752-J-PA03D-R02-S06		Digital Input Module	Digital Input Module (DI621) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03D		Operation	Fails to operate	Yes	- Digital Input Module - No impact, because no safety function depends on DI contact input. - It is for transfer switch status	
157	1-752-J-PA03D-R02-S07		Digital Output Module	Digital Output Module (DO620) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03D		Operation	Fails to operate	Yes	- Digital Output Module - No impact, because no safety function depends on DO contact input. - It is for transfer switch status	
158	1-752-J-PA03D-R02-		N/A	Dummy at CCG 1 in ESF-CCS		Operation	Fails to	Yes	- Dummy Module	

No.	Component ID		Component Type		Component Description				Normal	Failure Mode	Screening	Remark																																																															
	S08				Group Controller Cabinet, PA03D					operate		- No impacts																																																															
159	1-752-J-PA03D-R02-S09		N/A		Dummy at CCG 1 in ESF-CCS Group Controller Cabinet, PA03D				Operation	Fails to operate	Yes	- Dummy Module - No impacts																																																															
160	1-752-J-PA03D-R02-S10		CI Interface Processor		Component Interface Module (CI631) at CCG 1 in ESF-CCS Group Controller Cabinet, PA03D				Operation	Fails to operate	Yes	- Communication Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG2 - It impacts on corresponding channel's ESCM control manual control																																																															
<table><tr><td colspan="10">Group Controller – A2</td><td colspan="3" rowspan="6"></td></tr><tr><td>D</td><td>C</td><td>P</td><td>P</td><td>P</td><td>P</td><td>P</td><td>D</td><td>D</td><td>D</td></tr><tr><td>U</td><td>I</td><td>M</td><td>M</td><td>M</td><td>M</td><td>M</td><td>I</td><td>O</td><td>U</td></tr><tr><td>M</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>M</td></tr><tr><td>M</td><td>3</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>2</td><td>2</td><td>M</td></tr><tr><td>Y</td><td>1</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>1</td><td>0</td><td>Y</td></tr></table>													Group Controller – A2													D	C	P	P	P	P	P	D	D	D	U	I	M	M	M	M	M	I	O	U	M	6	6	6	6	6	6	6	6	M	M	3	4	4	4	4	4	2	2	M	Y	1	6	6	6	6	6	1	0	Y
Group Controller – A2																																																																											
D	C	P	P	P	P	P	D	D	D																																																																		
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M	3	4	4	4	4	4	2	2	M																																																																		
Y	1	6	6	6	6	6	1	0	Y																																																																		
161	1-752-J-PA03D-R03-S01		N/A		Group Controller (RB601) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D				Operation	Fails to operate	Yes	- Dummy Module - No impacts																																																															
162	1-752-J-PA03D-R03-S02		CI Interface Processor		Component Interface Module (CI631) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D				Operation	Fails to operate	Yes	- Component Interface Module - It causes the loss of ability to communication by AF1000 Internet network. - It impacts on when the coincidence failure of GC-1 CI631. - Redundant group controller has its own CI module which provides global memory and provides AF 100 access.																																																															
163	1-752-J-PA03D-R03-S03		Processor Module		PM Processor Module 1 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D				Operation	Fails to operate	No	- Group Controller 1 Processor Module 1 (GC-2 PM1). - It causes the loss of the A and C ESF Initiation signals. - It causes the loss of the (A or C) coincidence logic performed by PM1. - Redundant component control signal is available in the redundant group controller.																																																															

No.	Component ID	Component Type	Component Description	Normal	Failure Mode	Screening	Remark
164	1-752-J-PA03D-R03-S04	Processor Module	PM Processor Module 2 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 2 (GC-2 PM2). - It causes the loss of the B and D ESF Initiation signals. - It causes the loss of the (B or D) coincidence logic performed by PM2. - Redundant component control signal is available in the redundant group controller.
165	1-752-J-PA03D-R03-S05	Processor Module	PM Processor Module 3 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 3 (GC-2 PM3). - It causes the loss of the selective two out of four coincidence logic performed by PM 3. - It causes the loss of MCR CPM signals. - Redundant component control signal is available in the redundant group controller.
166	1-752-J-PA03D-R03-S06	Processor Module	PM Processor Module 4 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	No	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 4 (GC-2 PM4). - It causes the loss of RSR CPM signals. - Redundant RSR CPM signal is available in the redundant group controller.
167	1-752-J-PA03D-R03-S07	Processor Module	PM Processor Module 5 (PM646A) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Group Controller 1 Processor Module 5 (GC-2 PM5). - It causes the loss of component control signal propagation (ESCM signals and MI signals) from CCG to LC via PM5. - Redundant RSR CPM signal is available in the redundant group controller.
168	1-752-J-PA03D-R03-S08	Digital Input Module	Digital Input Module (DI621) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Digital Input Module - It is no impact on the safety function. - It causes the loss of local manual actuation in one GC in that channel, but the redundant GC is still functional. - Redundant group controller and redundant initiation signals are provided within the channel.
169	1-752-J-PA03D-R03-S09	Digital Output Module	Digital Output Module (DO620) at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Digital Output Module - It is no impact on the safety function. - It causes the loss of transmission the Transfer Switch status to the PPS.
170	1-752-J-PA03D-R03-S10	N/A	ESF-CCS group controller cabinet, PA03D(RB601)	Operation	Fails to operate	Yes	<ul style="list-style-type: none"> - Dummy Module - No impacts

No.	Component ID			Component Type		Component Description				Normal	Failure Mode	Screening	Remark
CCG – A2													
	D U M M Y	C I 6 3 1	P M 6 4 6	D U M M Y	D U M M Y	D I 6 2 1	D O 6 2 0	D U M M Y	D U M M Y	C I 6 3 1			
171	1-752-J-PA03D-R04-S01			N/A		Dummy at Group Controller 2 in ESF-CCS Group Controller Cabinet, PA03D				Operation	Fails to operate	Yes	- Dummy Module - No impacts
172	1-752-J-PA03D-R04-S02			CI Interface Processor		Component Interface Module (CI631) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03D				Operation	Fails to operate	Yes	- Component Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG1. - It impacts on corresponding channel's ESCM control manual control.
173	1-752-J-PA03D-R04-S03			Processor Module		PM Processor Module 1 (PM646A) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03D				Operation	Fails to operate	Yes	- Control Channel Gateway 1 Processor Module (CCG-2 PM) - It impact on when the coincidence failure of CCG-1 PM - It impacts corresponding channel's ESCM control
174	1-752-J-PA03D-R04-S04			N/A		ESF-CCS group controller cabinet, PA03D (RB601)				Operation	Fails to operate	Yes	- Dummy Module - No impacts
175	1-752-J-PA03D-R04-S05			N/A		ESF-CCS group controller cabinet, PA03D (RB601)				Operation	Fails to operate	Yes	- Dummy Module - No impacts
176	1-752-J-PA03D-R04-S06			Digital Input Module		Digital Input Module (DI621) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03D				Operation	Fails to operate	Yes	- Digital Input Module - No impact, because no safety function depends on DI contact input. - It is for transfer switch status
177	1-752-J-PA03D-R04-S07			Digital Output Module		Digital Output Module (DO620) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03D				Operation	Fails to operate	Yes	- Digital Output Module - No impact, because no safety function depends on DO contact input. - It is for transfer switch status
178	1-752-J-PA03D-R04-S08			N/A		ESF-CCS group controller cabinet, PA03D (RB601)				Operation	Fails to operate	Yes	- Dummy Module - No impacts
179	1-752-J-PA03D-R04-S09			N/A		ESF-CCS group controller cabinet, PA03D (RB601)				Operation	Fails to operate	Yes	- Dummy Module - No impacts
180	1-752-J-PA03D-R04-S10			CI Interface Processor		Component Interface Module (CI631) at CCG 2 in ESF-CCS Group Controller Cabinet, PA03D				Operation	Fails to operate	Yes	- Communication Interface Module - It impacts on when the coincidence failure of redundant CI631 module in CCG1. - It impacts on corresponding channel's ESCM control manual control