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Ref. № # 61/ДП dated 21.05.2019

Dated: May 21, 2019

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Subject: Comments on the Draft Safety Evaluation for the RadICS Topical Report
(Docket Number 99902032)

References: (1) Research and Production Corporation Radics LLC letter to NRC dated September 20, 2016, "Submittal of RadICS Digital I&C Platform Topical Report" (ADAMS Accession No. ML16274A346)
(2) NRC letter to Research and Production Corporation Radics LLC dated May 8, 2019, "Transmittal Letter Regarding Draft Safety Evaluation for "RADICS TOPICAL REPORT" (CAC No. MF8411; EPID: L-2016-TOP-0010)" (ADAMS Accession No. ML19003A471)

In Reference 1 Research and Production Corporation Radics (RPC Radics LLC) submitted a topical report for the RadICS digital instrumentation and control (I&C) platform. The RadICS Platform is a generic digital safety I&C platform designed to implement Class 1E safety-related applications in United States nuclear power plants. The NRC provided a draft copy of the safety evaluation for the RadICS Digital I&C Platform Topical Report for review in Reference 2.

Radics LLC has reviewed the draft safety evaluation to ensure that it accurately reflects the RadICS Topical Report and to identify proprietary information. As requested by NRC, Radics LLC has provided an electronic, redline/strikeout Word file of the draft safety evaluation. Brackets and yellow highlight to identify [proprietary information].

Enclosure 1 provides a table that lists comment number, comment location (page and line), comment type (clarification, editorial, proprietary information and basis from 10 CFR 2.390), the comment, and a blank column for NRC response.

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If you have any questions related to this submittal, please contact me at 423-834-4455 or by e-mail at mjburzynski@newcleardayinc.com.

Sincerely,

A handwritten signature in black ink that reads "Mark J. Burzynski". The signature is written in a cursive, flowing style.

Mark J. Burzynski
US Licensing Manager
RPC Radics LLC

Enclosure 1

Comments on Draft Safety Evaluation for RadICS Topical Report and NRC Response

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
1	Page 5 / Line 10	Clarification	Change RPC--Radyi to RPC Radyi	
2	Page 5 / Lines 16-21	Clarification	Change Radics LLC TR to RadICS TR in four places	
3	Page 5 / Line 36	Clarification	Change RPC-Radyi to Radics LLC	
4	Page 5 / Line 36	Clarification	Change Kirovograd to Kropyvnytskyi. Formal name changed by local government.	
5	Page 5 / Line 38	Clarification	Change RPC-Radyi's to RPC Radyi's	
6	Page 6 / Line 2	Editorial	Change date to March 1, 2018	
7	Page 6 / Line 3	Editorial	Change reference to 5	
8	Page 6 / Lines 7-8	Clarification	Change sentence to read: The NRC staff conducted an audit <u>of the RadICS platform development documents at the Kinectrics, Inc.</u> Radics LLC facilities in Toronto, Canada on April 2 through 5, 2018.	
9	Page 10 / Line 38	Clarification	Change RADIY to Radics	
10	Page 10 / Line 44	Clarification	Change Radyi to RPC Radyi	
11	Page 10 / Line 46	Clarification	Change ISO 9001:2008 to ISO 9001:2015	
12	Page 11 / Line 18	Clarification	Change Radics LLC to RadICS	
13	Page 11 / Line 46	Clarification	Change Radics LLC to RadICS	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
14	Pages 14-15 / Table 3.2.-1	Clarification	Add hardware identifier numbers to Table 3.2-1 This change makes the SER consistent with the information in Table 1 of the "EQ Summary Report 2016-RTS002-EQTSR-040" (ML18227A167).	
15	Pages 16 / Lines 9-10	Clarification	Change Radics LLC to RadICS-based in two places	
16	Page 17 / Figure 3.2.2.1	Clarification	Reverse the order of the Diagnostics and Application Logic blocks to better represent the software architecture and the relationship to RPCT.	
17	Page 22 / Lines 9-10	Clarification	Change Radiy chassis to RadICS chassis in two places	
18	Page 24 / Lines 5-6	Clarification	Change RadICS platform chassis to RadICS chassis in two places	
19	Page 24 / Line 14	Clarification	Change sentence to read: ... types of programmable logic; RadICS platform FPGA logic, self-diagnostics <u>FPGA and CPLD</u> logic, ...	
20	Page 24 / Line 23	Clarification	Change sentence to read: ... data between modules via the chassis backplane bus, <u>performing self-testing</u> , and processing ... The information is consistent with RadICS Topical Report Section 6.4.	
21	Page 24 / Line 36	Clarification	Change Radiy LLC to RPC Radiy ✓	
22	Page 25 / Line 16	Clarification	Change sentence to read: The logic development processes for both <u>the FPGA and CPLD</u> platform ...	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
			The information on the CPLD library was provided to NRC in Enclosure 3 to Radics LLC submittal dated August 2, 2018 (ML18219A841), RadICS Digital I&C Platform Topical Report Supplemental Information Update," that updated discussion on Diversity and Defense-In-Depth.	
23	Page 25 / Line 26	Clarification	Change sentence to read: Application <u>Logic</u> , <u>FPGA</u> and <u>CPLD</u> Platform function block libraries are different and distinct ... The information on the CPLD library was provided to NRC in Enclosure 3 to Radics LLC submittal dated August 2, 2018 (ML18219A841), RadICS Digital I&C Platform Topical Report Supplemental Information Update," that updated discussion on Diversity and Defense-In-Depth.	
24	Page 25 / Line 40	Clarification	Change RadICS LLC to Radics LLC	
25	Page 25 / Line 46	Clarification	Change RadICS QA program to Radics LLC QA program	
26	Page 26 / Line 14	Clarification	Change RadICS to Radics LLC	
27	Page 28 / Lines 1-2	Clarification	Change RadICS QA program to Radics QA Program Document (QAPD)	
28	Page 28 / Line 2	Clarification	Change RadICS to Radics LLC	
29	Page 28 / Line 3	Clarification	Change QAP [QA program] to QAPD	
30	Page 31 – Line 20	Clarification	Change RadICS to Radics	
31	Page 31 / Line 35	Clarification	Change RadICS to Radics LLC	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
32	Page 34 – Line 12	Clarification	Change Radics LLC to RadICS	
33	Page 34 – Line 18	Clarification	Change Radics LLC to RadICS	
34	Page 34 – Line 35	Clarification	Change Radics LLC to RPC Radiy	
35	Page 34 – Line 41	Clarification	Change Radics LLC to RadICS	
36	Page 34 / Line 50	Editorial	Change SFMP to FSMP	
37	Page 35 – Line 4	Clarification	Change Radics LLC to RadICS	
38	Page 35 / Line 19	Clarification	Change SIL 4 to software integrity level 4	
39	Page 36 – Line 23	Clarification	Change RadICS to Radics LLC	
40	Page 36 – Line 24	Clarification	Change Radics to Radiy	
41	Page 36 – Line 25	Clarification	Change Radiy to Radics	
42	Page 39 – Line 31	Clarification	Change Radics LLC to RPC Radiy	
43	Page 39 – Line 32	Clarification	Change Radics to RadICS and Radics LLC to RPC Radiy	
44	Page 39 / Line 35	Editorial	Change 3.5.1.2. to 3.4.1.2	
45	Page 39 / Line 39	Clarification	Change FBL to HW	
46	Page 40 / Line 5	Clarification	Change SIL 4 to software integrity level 4	
47	Page 40 / Line 30	Clarification	Change sentence to read: The security <u>vulnerability</u> assessments described in <u>Chapter 11 Sections 11.2 and 11.3</u> replace the security analyses ...	
48	Page 40 / Line 33	Clarification	Change RadICS to Radics LLC	
49	Page 40 / Line 41	Clarification	Change SIL 4 to software integrity level 4	
50	Page 41 / Line 43	Editorial	Change 4.1.2.3 to 3.2.2.3	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
51	Page 42 – Line 4	Clarification	Change Radics LLC to RadICS	
52	Page 42 – Line 32	Clarification	Change Radics LLC to RadICS	
53	Page 44 / Lines 4-5	Clarification	Change sentence to read: ... qualification test team and a metrology test team which are that <u>is</u> under authority of the project	
54	Page 46 – Line 38	Clarification	Change Radics LLC FSC to RadICS	
55	Page 47 / Line 28	Clarification	Change RadICS to Radics LLC	
56	Page 48 – Line 23	Clarification	Change Radics LLC to RPC Radiy	
57	Page 49 / Line 47	Clarification	Change third bullet to read: Analog Input (<u>Deviation more than 2% of span</u>)	
58	Page 51 / Line 48	Clarification	Change sentence to read: The following specification documents were provided to <u>or audited by</u> the NRC to support evaluation of the RadICS Safety Requirements Specification (SRS) documentation ...	
59	Page 53 / Line 35	Clarification	Change sentence to read: The qualification program developed for the Radics LLC Radics LLC <u>RadICS QTS</u> addressed ...	
60	Page 53 / Line 39	Clarification	Change Radics LLC RadICS platform to RadICS platform	
61	Page 53 / Line 43	Clarification	Change Kinetrics to Kinectrics	
62	Page 54 / Line 28	Clarification	Add new bullet: Chassis and Module Connections This change makes the SER consistent with the information on page 9 of the “EQ Summary Report 2016-RTS002-EQTSR-040” (ML18227A167).	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
63	Page 54 / Lines 32-36	Clarification	<p>Change sentence to read: Table 9-1 of the RadICS topical report (Reference 1) specifies the qualification envelope for temperature and humidity to be 40 to 140 122 Deg. F (4.4 to 60 50 Deg. C) and 10 to 90% relative humidity (non-condensing). Environmental test levels are specified to be 34.9 35 to 148.5 140 Deg. F (1.6 1.7 to 64.7 60 Deg. C) and 5 to 95% relative humidity (non-condensing), thus encompassing the platform temperature and humidity specifications.</p> <p>This change makes the SER consistent with the information on page 24 of the "EQ Summary Report 2016-RTS002-EQTSR-040" (ML18227A167).</p>	
64	Page 55 / Line 8	Editorial	Change 17330 to 107330	
65	Page 58 / Line 41	Clarification	<p>Change first bullet in Section 3.6.3.4 to read: IEC 61000-4-4, "Power Leads: Test Voltage Level: 21 kV maximum"</p> <p>This change makes the SER consistent with the information in Section G.13 of the "EQ Summary Report 2016-RTS002-EQTSR-040" (ML18227A167).</p>	
66	Page 60 / Lines 23-29	Clarification	<p>Change sentence to read: Table 9-1, "Generic Qualification Envelope for the RadICS Digital Safety I&C Platform" of the RadICS platform TR specifies the seismic qualification requirements to be 5 triaxial OBE tests with a <u>Required Response Spectrum (RRS) curve given as Figure 4-5 in EPRI TR-107330 with a peak acceleration</u></p>	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
			<p><u>of 9.8 g between 4.5 and 16 Hz and minimum zero period acceleration (ZPA) of 4.9 g followed by one triaxial SSE test with a RRS curve given as Figure 4-5 in EPRI TR-107330 with a peak acceleration of 14 g between 4.5 and 16 Hz and minimum ZPA of 7 g.</u></p> <p>This change makes the SER consistent with the information on pages 25 and 54-57 of the "EQ Summary Report 2016-RTS002-EQTSR-040" (ML18227A167).</p>	
67	Page 61 / Lines 18-23	Clarification	<p>Change the paragraph to read: Section 5.2.1 of the RadICS platform TR states that "input acceleration levels used for Cabinet Seismic Resistance Test is set high enough to cover the floor response spectrum range of power plants in the U.S." Due to the generic applicability of this safety evaluation, the NRC staff was not able to confirm the accuracy of this statement for all U.S. plants thus, aAn applicant referencing this safety evaluation will need to confirm that RadICS platform equipment seismic qualification levels are within plant specific design basis seismic conditions for SSE and OBE earthquakes. This information was not provided in the RadICS Topical Report and appears to be a copy error from the recently issued SER for the MELTAC Topical Report.</p>	
68	Page 61 / Lines 26-31	Clarification	<p>Change the paragraph to read: <u>The acceleration envelope established for RadICS equipment exceeded the acceleration Acceleration levels</u></p>	

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			<p>specified for generic plant SSE in EPRI TR-107330, greater than the acceleration envelope established for RadICS equipment. Because the RadICS platform equipment was not tested to acceleration levels greater than 7 g, it does not meet the criteria for generic seismic qualification at plant sites having greater than 7 g postulated plant specific SSE acceleration levels.</p> <p>This change makes the SER consistent with the information on pages 25 and 54-57 of the "EQ Summary Report 2016-RTS002-EQTSR-040" (ML18227A167).</p>	
69	Page 62 / Lines 4-10	Clarification	<p>Change the paragraph to read: Based on review of the RadICS seismic test results and supporting analysis, the NRC staff determined that the RadICS platform does not fully satisfy <u>satisfies</u> the guidance criteria of EPRI TR-107330 because seismic withstand performance requirements were not demonstrated for the maximum acceleration level of 14 g for a generic SSE. However, t The NRC staff finds that seismic qualification of the RadICS platform has been acceptably demonstrated for OBE and SSE events up to acceleration levels shown in the OBE and SSE test results spectra in the RadICS Equipment Qualification Test Report (Reference 8).</p> <p>This change makes the SER consistent with the information on pages 25 and 54-57 of the "EQ Summary Report 2016-RTS002-EQTSR-040" (ML18227A167).</p>	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
70	Page 62 / Lines 43-45	Clarification	<p>Change the paragraph to read: The second is 10 CFR 50.36(c)(1)(ii)(A), which provides basis for timing requirements commitments by requiring the inclusion of the limiting safety systems settings for nuclear reactors in the plant technical specifications, "so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded."</p> <p>Radics LLC did not make any commitments on this matter.</p>	
71	Page 63 / Line 20	Clarification	Change Radics to Radics LLC	
72	Page 65 / Lines 21-24	Clarification	<p>Change the sentence to read: The NRC staff determined that design features, operation of the RadICS system, and <u>PSAI 7.3 Radics LLC's</u> commitments to perform timing analysis and tests provide sufficient confidence that provide sufficient confidence that RadICS based safety systems will operate deterministically to meet the recommendations of BTP 7-21 and is therefore acceptable.</p> <p>Radics LLC did not make any commitments on this matter. This information was not provided in the RadICS Topical Report and appears to be a copy error from the recently issued SER for the MELTAC Topical Report.</p>	
73	Page 65 / Lines 36-37	Clarification	Change the sentence to read: ... <u>all safety</u> discrete outputs to fail-safe states.	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
74	Page 66 / Line 2	Clarification	Change the paragraph to read: Type III – User defined level faults. The user defines criticality of detected errors and their processing algorithm. <u>The responses to</u> Type III faults are not addressed by the RadICS platform design. Methods to identify and mitigate these faults must be implemented within application design during plant specific development activities	
75	Page 66 / Line 24	Clarification	Change Radics LLC to RadICS	
76	Page 69 / Lines 33-41	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
77	Page 70 / Lines 13-15	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
78	Page 70 / Lines 19-21	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
79	Page 70 / Lines 24-26	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
80	Page 70 / Lines 29--50	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
81	Page 71 / Lines 1-13	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
82	Page 71 / Lines 35-47	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
83	Page 71 / Lines 45-47	Clarification	<p>Delete the sentences: Therefore, if a licensee chooses to credit internal diversity between features of the Quartus II tool, a separate diversity assessment would need to be performed as an application specific action item. See PSAI 7.9.</p> <p>This information was identified as implicit attributes of the FPGA and CPLD configuration tool that was not explicitly defined nor verified for the RadICS Platform diversity strategy in Enclosure 3 to Radics LLC submittal dated August</p>	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
			2, 2018 (ML18219A841), "RadICS Digital I&C Platform Topical Report Supplemental Information Update," that updated discussion on Diversity and Defense-In-Depth."	
84	Page 72 / Lines 2-3	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
85	Page 72 / Lines 5-11	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
86	Page 72 / Lines 9-11	Clarification	<p>Delete the sentences: Therefore, a licensee activity should be performed to determine sufficient separation is established when this defensive measure is to be credited. See PSAI 7.9.1.</p> <p>Separation is achieved on the modules because the FPGA and CPLD are discrete and separate components, as described in RadICS Topical Report Section 6.8. The communication protocol, between the FPGA and CPLD is described in RadICS Topical Report Section 6.3.3.2.6.</p>	
87	Page 72 / Lines 13-28	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
88	Page 72 / Line 30	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
89	Page 72 / Lines 32-44	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
90	Pages 73-76 / Table 3.8-1 (Items 1 – 6)	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
91	Page 76 – Item 6	Clarification	Radics LLC expected a determination on the logic diversity for the three domains (Electronic Design safety functions, self-test and diagnostic functions, and the PSWD functions). The inherent diversity for different timing or order of	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
			<p>execution based on the parallel processing of these diverse functions using three separate clock domains.</p> <p>This information was provided to NRC in Enclosure 3 to Radics LLC submittal dated August 2, 2018 (ML18219A841), "RadICS Digital I&C Platform Topical Report Supplemental Information Update," that updated discussion on Diversity and Defense-In-Depth."</p>	
92	Page 77 / Lines 5-6	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 1)	
93	Page 80 / Line 2	Clarification	<p>Change sentence to read: ... provide communications between <u>LMs</u> or <u>OCMs</u> in different safety divisions ...</p> <p>This information was provided to NRC in the response to RAI-P1-02 in Radics LLC submittal dated April 13, 2018 (ML18107A173), "Response to Request for Additional Information for RadICS Topical Report."</p>	
94	Page 80 / Lines 48-49	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
95	Page 82 / Lines 24-27	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
96	Page 82 / Lines 32-39	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
97	Page 83 / Lines 1-9	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
98	Page 83 / Lines 35-36	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
99	Page 83 / Lines 39-40	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
100	Page 83 / Lines 46-47	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
101	Page 83 / Line 48	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
102	Page 84 / Line 2	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
103	Page 84 / Line 5	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
104	Page 84 / Line 16	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
105	Page 85 / Lines 5-7	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
106	Page 87 / Lines 9-18	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
107	Page 87 / Lines 28-29	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
108	Page 88 / Lines 49-50	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
109	Page 89 / Lines 7-8	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
110	Page 89 / Lines 10	Clarification	Change Radiy to Radics	
111	Page 89 / Lines 44-47	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
112	Page 90/ Lines 2-4	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
113	Page 90 / Lines 46-47	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
114	Page 91 / Lines 18-19	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	
115	Page 101 / Line 34	Clarification	Change Radiy LLC to Radics LLC	
116	Page 101 / Line 39	Clarification	Change RPS Radiy to RPC Radiy	
117	Page 101 / Lines 43-44	Clarification	Change ISO 9001:2008 to ISO 9001:2015 in two places	
118	Page 102 / Line 2	Clarification	Change RadICS to Radics LLC	
119	Page 102 / Line 7	Clarification	Change Radiy to Radics	
120	Page 102 / Line 14	Clarification	Change QAP policy to QA policy	
121	Page 102 / Line 15	Clarification	Change sentence to read: The Radics LLC Appendix B based QAP policy is established in	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
			the RadICS QAPD Description (QAPD) document, (QAPD-001), which ...	
122	Page 102 / Line 17	Clarification	Change QAP to QAPD	
123	Page 102 / Line 28-29	Clarification	Change QAP to QAPD in two places	
124	Page 104 / Line 32	Clarification	Change Radics LLC to RadICS platform	
125	Page 104 / Line 35	Clarification	Change Radics LLC based to RadICS platform-based	
126	Page 105 / Line 34	Clarification	Change sentence to read: ... should be established as during plant-specific application development.	
127	Page 105 / Line 34	Clarification	Add sentence at end of paragraph: See PSAI 7.10.	
128	Page 110 / Line 20	Clarification	Change Radics LLC to RadICS	
129	Page 111 / Line 6	Clarification	Change QAP to QAPD	
130	Page 111 / Line 7	Clarification	Change RadICS to Radics LLC	
131	Page 111 / Line 22	Clarification	Change QAP to QAPD	
132	Page 111 / Lines 24-25	Clarification	Change QAP to QAPD in two places	
133	Page 113 / Line 1	Clarification	Change Radiy to Radics	
134	Page 113 / Line 19	Clarification	Change integrity level (Level 4) to software integrity level 4	
135	Page 113 / Line 26	Clarification	Change SIL 4 to software integrity level 4	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
136	Page 114 / Line 6	Clarification	Change sentence to read: IEEE Std. 828-2005 and IEEE Std. 1042-1987 are endorsed by RG 1.169. IEEE Std 1042 is no longer endorsed by RG 1.169.	
137	Page 114 / Line 11	Clarification	Change sentence to read: The NRC evaluated the Radics LLC configuration management program, described in Section 7.5 of the RadICS TR, and determined it to be compliant with the criteria of IEEE Std. 828-2005 and IEEE Std. 1042-1987 as endorsed by RG 1.169. IEEE Std 1042 is no longer endorsed by RG 1.169.	
138	Page 114 / Line 39	Clarification	Change Radics LLC component to RadICS	
139	Page 116 / Line 12	Editorial	Change 106430 to 106439	
140	Page 116 / Line 23	Clarification	Change Radics LLC component to RadICS-	
141	Page 119 – Line 26	Clarification	Change Radics LLC to RadICS	
142	Page 119 / Lines 40-41	Clarification	Change sentence to read: However, because Radics LLC did not define the actions to be taken when <u>Type III</u> faults are detected ...	
143	Page 121 – Line 1	Clarification	Change Radics LLC to RadICS	
144	Page 121– Line 7	Clarification	Change Radics LLC to RadICS	
145	Page 122– Line 27	Clarification	Change Radics LLC to RadICS	
146	Page 122 – Line 30	Clarification	Change Radics LLC to RadICS	
147	Page 122 / Line 38	Clarification	Change Radics LLC to RadICS	
148	Page 123 / Lines 20-21	Clarification	Change Radics LLC to RadICS system	
149	Page 128 / Lines 5-8	Proprietary	Deemed Proprietary by RPC Radics LLC (Note 2)	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
150	Page 131 / Line 7	Clarification	Change RADICS to RadICS	
151	Page 131 / Line 19	Clarification	Change Section 8 to Sections 7 and 8	
152	Page 133 / Lines 10-14	Clarification	<p>Change paragraph to read: <u>Self-Diagnostics Design Requirements</u> – The licensee must establish requirements for <u>validation enabling and testing of Type III necessary self-diagnostics features to ensure plant safety requirements are satisfied.</u> to ensure used to identify and address postulated control or protection logic common cause failures within the RadICS safety system.</p> <p>This information was provided to NRC in Enclosure 3 to Radics LLC submittal dated August 2, 2018 (ML18219A841), “RadICS Digital I&C Platform Topical Report Supplemental Information Update,” that updated discussion on Diversity and Defense-In-Depth.”</p>	
153	Page 133 / Lines 16-20	Clarification	<p>Change paragraph to read: <u>Plant Specific Fail-Safe Behavior Requirements Definition</u> – Fail Safe state requirements shall be established by the licensee for all <u>components actuated by the RadICS Platform safety functions</u> to ensure plant safety is achieved when RadICS system logic failures (<u>e.g., Type I, II, or III faults</u>) are detected by system self-diagnostic functions.</p> <p>This information was provided to NRC in Enclosure 3 to Radics LLC submittal dated August 2, 2018 (ML18219A841), “RadICS Digital I&C Platform Topical Report Supplemental</p>	

NUMBER	LOCATION	COMMENT TYPE	COMMENT	NRC RESPONSE
			Information Update," that updated discussion on Diversity and Defense-In-Depth."	
156	Page 133 / Lines 22-34	Clarification	<p>Change paragraph to read:</p> <p><u>Conservation of Existing Diversity Measures –</u> The applicant or licensee must confirm that <u>installation of a RadICS protection system is diverse from for the system for reducing the risk from anticipated transients without scram, as required by 10 CFR 50.62 and existing diversity</u> attributes of the existing protection system are preserved in the upgraded system. This diversity may be expressed in the signal selection and protection system functional algorithms established and accepted for the plant design. The applicant or licensee should confirm that functional diversity that has been added to safety systems based on operating experience (e.g., requiring both under-voltage and shunt trip features for reactor trip breakers) is retained. For example, the applicant or licensee should confirm that the additional diversity that has been included in plant I&C designs to establish compliance with 10 CFR 50.62 is maintained in the revised safety system design.</p> <p>This information was provided to NRC in Enclosure 3 to Radics LLC submittal dated August 2, 2018 (ML18219A841), "RadICS Digital I&C Platform Topical Report Supplemental Information Update," that updated discussion on Diversity and Defense-In-Depth."</p>	

- Note 1 - The basis for withholding the proprietary information was provided in Research and Production Corporation Radics LLC letter to NRC dated August 2, 2018, "Submittal of RadICS Digital I&C Platform Topical Report Supplemental Information Update (Docket Number 99902032)." (ADAMS Accession No. ML18219A747)
- Note 2 - The basis for withholding the proprietary information was provided in Research and Production Corporation Radics LLC letter to NRC dated April 13, 2018, "Response to Request for Additional Information for RadICS Topical Report (CAC NO.: MF841 1; EPID: L-2016-TOP-0010)." (ADAMS Accession No. ML18107A238)