List of Typos and Other Errata in APR1400 Application (as of 3 AUG 2015)

Location	Original Text	Suggested Correction
DCD Tier 2, Chapter 7 Acronyms	Containment spray and communication section both have the same acronym.	Change the acronyms so that they are unique to each term.
DCD Tier 2, 7.1	The I&C architecture of the APR1400 is implemented by two major independent and diverse platforms	An architecture cannot be implemented using a platform. The systems within the architecture can be. Also, "implemented with" is better than "implemented by." The correct English is, "The I&C systems of the APR1400 is implemented using two major independent and diverse platforms:"
DCD Tier 2, 7.1	Some I&C functions are not installed on a common PLC and DCS platform.	Functions are not installed on a platform. Better way of stating this is, "Some I&C functions are allocated to systems that are not based on the common PLC or DCS platform."
DCD Tier 2, 7.1.1.2	When a safety limit is approached, the RPS function in the PPS cabinet initiates a signal that opens the reactor trip breakers.	The word "function" is does not fit here. When a safety limit is approached, the RPS portion of the PPS initiates a signal that opens the reactor trip breakers.
DCD Tier 2, 7.1.1.5.c	The BISI is monitored on the large display panel (LDP) and information flat panel display (FPD).	Is FPD the intended acronym or should it be IFPD? Figure 7.1-1 uses IFPD.

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Location	Original Text	Suggested Correction
DCD Tier 2, Sec. 7.1.2.13	The I&C systems that are applicable to 10 CFR 50.62 (Reference 20), as shown in Table 7.1-1, are designed in accordance with 10 CFR 50.62, which states in part, "Each pressurized water reactor manufactured by Combustion Engineering must have a diverse scram system from the sensor output to interruption of power to the control rods."	The quote used in the original text is from 10 CFR 50.62c(2). The following quote from 10 CFR 50.62c(1)should be used: "Each pressurized water reactor must have equipment from sensor output to final actuation device, that is diverse from the reactor trip system, to automatically initiate the auxiliary (or emergency) feedwater system and initiate a turbine trip under conditions indicative of an ATWS. This equipment must be designed to perform its function in a reliable manner and be independent (from sensor output to the final actuation device) from the existing reactor trip system."
DCD Tier 2, Sec. 7.1.2.36	"Analyses and design features for diversity and defense-in-depth for the PPS and ESFAS are provided…"	Is ESFAS part of the PPS?
DCD Tier 2, Sec. 7.2.1.2	For example, the first set of two LCL processors generates two redundant trip signals based on the following logic combination: 2-out-of-4 of [(1-out-of-2 of A1 and A2), (1-out-of-2 of B1 and B2), (1-out-of-2 of C1 and C2), (1-out-of-2 of D1 and D2)].	Sentence confusing. Do you mean "For example, each of the two redundant LCL processors generates a trip signal based on the following logic combination: 2-out-of-4 of [(1-out-of-2 of A1 and A2), (1-out-of-2 of B1 and B2), (1-out-of-2 of C1 and C2), (1-out-of-2 of D1 and D2)]?"
DCD Tier 2, Sec. 7.2.1.2	The bypass status is available for display at the MTPs, OMs, and IPS.	Not clear whether the bypass status is going to be displayed or that it is only available to be displayed but other actions are needed to display it. Maybe it should state, "The bypass status is displayed on the MTPs, OMs, and IPS."
DCD Tier 2, Sec. 7.2.1.6	The bypass status is indicated at the MTP and OM in the MCR.	The bypass status is indicated on the MTP and OM in the MCR.

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Location	Original Text	Suggested Correction
DCD Tier 2, Sec. 7.3.1	"and for divisions of the engineered safety features…"	"and four divisions of the engineered safety features…"
DCD Tier 2, Sec. 7.9.1.b	Serial data link (SDL), which is seismically and environmentally qualified and classified as a safety-critical (SC) software class but the interdivisional interface and test processor (ITP) data link and ITP to QIAS-N SDLs are exceptionally classified as ITS software class	What does exceptionally mean?
DCD Tier 2 Chapter 7	(General observation)	Safety or non-safety classification is not clearly mentioned for some systems in the DCD (although it could be found inside the text description), a typical example is the remote shutdown room and its equipment inside.
DCD Tier 2, Sec. 8.3.1.1.3.1	The EDGs are started in the event of the following occurrences: a. Automatic (through load sequencer logic shown in Figure 7.3-4)	The EDGs are started in the event of the following occurrences: a. Automatic (through load sequencer logic shown in Figure 7.3-21)
DCD Tier 1, Section 2.5.1	Reactor Trip System and Engineered Safety Features Initiation	The title attempts to combine identification of a system and a function which is confusing. Recommend choosing one or the other. This applies to the rest of the section.
DCD Tier 1, Sec. 2.5.1.1	The engineered safety features (ESF) system consists of four sensors, APC-S cabinets, and four divisions of the engineered safety features actuation system (ESFAS) portion of the PPS cabinets and engineered safety feature-component control system (ESF-CCS) cabinets.	The engineered safety features (ESF) system consists of four channels of sensors, APC-S cabinets, and four divisions of the engineered safety features actuation system (ESFAS) portion of the PPS cabinets and engineered safety feature-component control system (ESF-CCS) cabinets.

List of Typos and Other Errata in APR1400 Application (as of 3 AUG 2015)

Location	Original Text	Suggested Correction
DCD Tier 1, Sec. 2.5.1.1	The ESF initiation is performed in sensors, APC-S cabinets and the ESFAS portion of the PPS cabinets.	The ESF initiation is not performed "in" a sensor. It is performed "by" sensors. Also, it is better to remove the word cabinet and just leave it with the system because it is the system that performs the function not the cabinet. Recommended wording: "The ESF initiation is performed by sensors, the APC-S and the ESFAS portion of the PPS."
DCD Tier 1, Sec. 2.5.1.1	2. The Class 1E equipment identified in Table 2.5.1-1 withstand the electrical surge, electromagnetic interference (EMI), radio frequency interference (RFI), and electrostatic discharge (ESD) conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	2. The Class 1E equipment identified in Table 2.5.1-1 withstand the electrical surge, electromagnetic interference (EMI), radio frequency interference (RFI), and electrostatic discharge (ESD) conditions that could exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
DCD Tier 1, Sec. 2.5.1.1	3.c Communication independence is achieved between redundant divisions of the Class 1E equipment listed in Table 2.5.1-1 or between non-safety systems and the Class 1E equipment listed in Table 2.5.1-1.	3.c Communication independence is achieved between redundant divisions of the Class 1E equipment listed in Table 2.5.1-1 and between non-safety systems and the Class 1E equipment listed in Table 2.5.1-1.
DCD Tier 1, Sec. 2.5.1.1	The PPS provides manual trip bypasses on the MTP switch panel, for RT and ESF initiation identified in Tables 2.5.1-2 and 2.5.1-3, respectively.	The capability to manually bypass trip signals exists on the MTP switch panel, for RT and ESF initiation identified in Tables 2.5.1-2 and 2.5.1-3, respectively.
DCD Tier 1, Sec. 2.5.1.1	7.c The PPS provides indications of the bypassed or inoperable status indication (BISI) on the OM in the MCR for the variables identified in Tables 2.5.1-2 and 2.5.1-3 for RT and ESF initiation.	7.c The PPS provides bypassed or inoperable status indications (BISI) on the OM in the MCR for the variables identified in Tables 2.5.1-2 and 2.5.1-3 for RT and ESF initiation.

List of Typos and Other Errata in APR1400 Application (as of 3 AUG 2015)

Location	Original Text	Suggested Correction
DCD Tier 1, Sec. 2.5.1.1	8. Each PPS division is controlled from either the MCR or the RSR as selected from master transfer switches.	8. Each PPS division can be controlled from either the MCR or the RSR as selected from master transfer switches.
DCD Tier 1, Sec. 2.5.1.1	15. The input signals of PPS through APC-S or ENFMS are derived from RT and ESF measurement instrumentation that measures monitored variables identified in Tables 2.5.1-2 and 2.5.1-3.	15. The input signals of the PPS that are received through APC-S or ENFMS are derived from RT and ESF measurement instrumentation that measures monitored variables identified in Tables 2.5.1-2 and 2.5.1-3.
DCD Tier 1, Sec. 2.5.1.1	19. The Class 1E instrument identified in Table 2.5.1-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	19. The Class 1E instrument identified in Table 2.5.1-1 as being qualified for a harsh environment can withstand the environmental conditions that could exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
DCD Tier 1, Sec. 2.5.1.1	23. Two sets of RTSS which consists of four RTSGs are diverse each other.	23. Two sets of RTSS which consists of four RTSGs are diverse each other.
DCD Tier 1 Section 2.5.1.1	21. A single channel of RTS and ESF initiation is bypassed to allow testing, maintenance or repair and this capability does not prevent the RTS and ESF initiation from performing its safety function.	21. A single channel of RTS and ESF system can be bypassed to allow testing, maintenance or repair. This capability does not prevent the RTS or ESF system ~~initiation~~ from performing its safety function.
DCD Tier 1 Table 2.5.1-5, Item 4a, acceptance criteria	Each as-built RTSS opens upon receipt of the automatic reactor trip signal identified in Table 2.5.1-2 from respective division of the as-built RTS, and as-built ESF initiation signals are sent to ESF-CCS upon receipt of the automatic ESF initiation signal identified in Table 2.5.1-3.	What is meant by as-built ESF initiation signals?

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Location	Original Text	Suggested Correction
DCD Tier 1, Sec. 2.5.2.1	The DIS provides functions to monitor critical variables and to control heated junction thermocouple (HJTC) heater power when the CCF of digitalized safety I&C systems occurs.	The DIS provides the capability to monitor critical variables and to control heated junction thermocouple (HJTC) heater power upon a CCF of the digital safety I&C systems.
DCD Tier 1 Section 2.5.2.1	2. The DPS is physically separate, electrically independent, and diverse from the PPS and ESF-CCS including a diverse method for the reactor trip, the turbine trip, the auxiliary feedwater actuation and safety injection actuation.	2. The DPS is physically separate, electrically independent, and diverse from the PPS and ESF-CCS. The DPS provides a diverse method to initiate reactor trip, turbine trip, auxiliary feedwater actuation and safety injection actuation.
DCD Tier 1 Section 2.5.2.1	3. The DPS provides the automatic functions as shown in Table 2.5.2-2, if plant process signals exceed predetermined setpoints.	3. The DPS provides the automatic functions shown in Table 2.5.2-2, if plant process signals exceed predetermined setpoints.
DCD Tier 1 Section 2.5.3.1	2. QIAS-P equipment, identified in Table 2.5.3-1, can withstand the electrical surge, electromagnetic interference (EMI), radio frequency interference (RFI), and electrostatic discharge (ESD) conditions that would exist before, during, and following a postulated accidents without loss of its safety function for the time required to perform the safety function.	2. QIAS-P equipment, identified in Table 2.5.3-1, can withstand the electrical surge, electromagnetic interference (EMI), radio frequency interference (RFI), and electrostatic discharge (ESD) conditions that could exist before, during, and following a postulated accidents without loss of its safety function for the time required to perform the safety function.

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Location	Original Text	Suggested Correction
DCD Tier 1 Section 2.5.4.1	5. Each ESF-CCS division receives ESFAS initiation signals from two divisions of the RMS as shown in Tables 2.7.6.4-2 and 2.7.6.5-2 and performs 1-out-of-2 logic taken twice except the fuel handling area emergency ventilation actuation signal which has one 1-out-of-2 logic to perform the BOP ESF actuation functions identified in Table 2.5.4-2.	5. Each ESF-CCS division receives ESFAS initiation signals from two divisions of the RMS as shown in Tables 2.7.6.4-2 and 2.7.6.5-2, and performs 1-out-of-2 logic taken twice using these signals. An exception is the fuel handling area emergency ventilation actuation function in which each ESF-CCS division uses 1-out-of-2 logic to perform the BOP ESF actuation functions identified in Table 2.5.4-2.
DCD Tier 1 Section 2.5.4.1	6. Upon receipt of a SIAS, CSAS, or AFAS, the ESF-CCS initiates an automatic start of the EDGs and automatic EDG loading sequencer of ESF loads identified in Table 2.5.4-2.	6. Upon receipt of a SIAS, CSAS, or AFAS, the ESF-CCS initiates an automatic start of the EDGs and automatic EDG load sequencing of ESF loads identified in Table 2.5.4-2.
Section 2.5.4.1	7. Upon detecting loss of power to Class 1E buses, the ESF-CCS initiates startup of the EDGs, shedding of electrical loads, transfer of Class 1E bus connections to the EDGs, and EDG loading sequencer to the reloading of safety-related loads to the Class 1E buses.	7. Upon detecting loss of power to Class 1E buses, the ESF-CCS initiates startup of the EDGs, shedding of electrical loads, transfer of Class 1E bus connections to the EDGs, and the EDG load sequencer to reload safety-related loads onto the Class 1E buses.
DCD Tier 1 Section 2.5.4.1	8. Each ESF-CCS division is controlled from either the MCR or RSR, as selected from MCR/RSR master transfer switches.	8. Each ESF-CCS division can be controlled from either the MCR or RSR. The transfer of control between the MCR and RSR is achieved using the MCR/RSR master transfer switches.

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Location	Original Text	Suggested Correction
DCD Tier 1 Section 2.5.4.1	16. The ESF-CCS equipment and components identified in Table 2.5.4-1 withstand the electrical surge, electromagnetic interference (EMI), radio-frequency interference (RFI), and electrostatic discharge (ESD) conditions that would exist before, during, and following a design basis event without loss of its safety function for the time required to perform the safety function.	16. The ESF-CCS equipment and components identified in Table 2.5.4-1 withstand the electrical surge, electromagnetic interference (EMI), radio-frequency interference (RFI), and electrostatic discharge (ESD) conditions that could exist before, during, and following a design basis event without loss of its safety function for the time required to perform the safety function.
DCD Tier 1 Section 2.5.4.5	The PCS and P-CCS are controlled from either the MCR or RSR, as selected from master transfer switches.	The PCS and P-CCS can be controlled from either the MCR or RSR. The transfer of control between the MCR and RSR is achieved using the master transfer switches.
D3 TeR Section 5.1 and Table A-1	Section 5.1 of the D3 TeR states, "The safety class sensors and APC-S are analog equipment." Table A-1 of the D3 TeR, row 4 "Hardware based modules" shows APC-S as one of the subsystems.	Why is there an inconsistency on whether the APC-S is analog equipment or hardware based modules (e.g. integrated discrete electronic devices)? Which one is correct?
Setpoint Methodology for Plant Protection System TeR Section 2.3.2.2	In this case the measurement test error is taken, twice in the calibration of periodic test error…	Comma should probably be added after the word "case" and comma should be removed after word "taken."
Setpoint Methodology for Plant Protection System TeR Section 2.5.3	The AV is less conservative than the TSP, by the amount of the PPS cabinet periodic test error.	Comma after the word "TSP" is grammatically incorrect.

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Location	Original Text	Suggested Correction
Setpoint Methodology for Plant Protection System TeR	TeR, Section 2.4.10, states, in part, "Non-random errors are indicated by the upper case letters with prime A', B', C', …N'. When encountered in the analysis, these errors are added algebraically." TeR, Appendix A, "PRESSURIZER PRESSURE - HIGH TRIP SETPOINT CALCULATION," has a measurement channel uncertainty named "N. Termination, Splicing Effects," and this uncertainty is algebraically added to SRSS term to arrive at the MEASUREMENT CHANNEL ACCIDENT CONDITION (AC) ERROR.	Is this uncertainty component considered a non-random error, and if so, should the nomenclature be N prime instead of N to be consistent with TeR, Section 2.4.10? This is just one example – please double check other trip setpoint calculations for usage of non-random errors.
Setpoint Methodology for Plant Protection System TeR Section 2.1	The draft trip setpoint (DTSP) is more conservative value than the AL by the amount of the total instrument channel uncertainty.	Staff understands what the applicant is trying to say. However, the sentence structure needs improvement for clarity. A more clearer way of stating this phrase is "The difference between the analytical limit and the limiting trip setpoint is the total instrument channel uncertainty."
Safety I&C System TeR Section 4.2.4	Equipment and circuits of the PPS require four division physical separation and electrical isolation meeting the requirements of IEEE Std. 384 as endorsed by RG 1.75.	Sentence does not make grammatical sense.
Safety I&C System TeR Section A.5.9	Access to equipment rooms and cabinets are controlled by the utility to only personnel who are intended to have access	Do you mean authorized to have access?
Safety I&C System TeR Section A.6.4	The plant parameters monitored are presented in report which provides signal descriptions for RPS and ESFAS	Do you mean in this report?