

AP1000 Standard Combined License Technical Report

Operator Actions Minimizing Spurious ADS Actuation

Revision 1

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INTRODUCTION:

This technical report addresses AP1000 Design Control Document (Reference 1) Combined Operating License (COL) Information Item 9.5-5 and NRC FSER (Reference 2) Combined License Action Item 9.5.1-4 on Operator Actions Minimizing Spurious ADS Actuation.

DCD Paragraph 9.5.1.8, Combined License Information:

“The Combined License applicant will provide an analysis that demonstrates that operator actions which minimize the probability of the potential for spurious ADS actuation as a result of a fire can be accomplished within 30 minutes following detection of the fire and the procedure for the manual actuation of the valve to allow fire water to reach the automatic fire system in the containment maintenance floor.”

Based on this report the NRC should consider the COL Information Item closure to be acceptable and generically applicable to COL applications referencing the AP1000 design certification.

TECHNICAL BACKGROUND:

This COL item has two unrelated parts:

1. The analysis required to demonstrate that operator actions to minimize the probability of spurious ADS actuation can be accomplished within 30 minutes, and
2. The procedure for manual actuation of the valve to allow fire water to reach the automatic fire system in the containment maintenance floor.

Each of these two parts is addressed independently in this report.

As stated in the Appendix 9A of the AP1000 DCD:

“Spurious actuation of squib valves is prevented by the use of a squib valve controller circuit which requires multiple hot shorts for actuation, physical separation of potential hot short locations, and provisions for operator action to remove power from the fire zone. No postulated fire can spread to the hot short locations before the operator can remove power from the fire zone.

“Automatic depressurization system stages 1, 2, and 3 consist of parallel paths, each path having two motor-operated valves in series. Spurious stage 1, 2, or 3 actuation is prevented by the use of physical separation of control circuits for the two series valves and provisions for operator action to remove power from the fire zone. No postulated fire can spread to the hot short locations before the operator can remove power from the fire zone.”

This analysis is provided to demonstrate that the operators can remove power in areas of the plant where prolonged fires could result in the multiple hot shorts required for spurious automatic depressurization system (ADS) actuation within 30 minutes of the fire initiation. The specific plant rooms where there is a potential for multiple hot shorts causing spurious ADS actuation are: the Main Control Room (MCR), Division A I&C room, Division B I&C room, Division C I&C room, Division D I&C room, Division A penetration room, and Division C penetration room. This analysis assumes that a fire starts in one of these rooms or in a room in the same fire area as one of these rooms and eventually spreads to the entire fire area. Spurious ADS actuation requires multiple hot shorts; therefore, with no operator action, a spurious

ADS actuation is unlikely. The operator actions analyzed will further reduce the probability of spurious ADS actuation.

Following detection of a fire in one of the instrumentation and control rooms, penetration rooms, or battery rooms, or the Division C RCP switchgear room the operators will remove actuation power from this division using the battery transfer switch located in the dc equipment room to disconnect the battery and remote control from the control room to remove input power from the battery charger and regulating transformer. This operator action will prevent spurious actuation of motor operated valves and squib valves resulting from multiple hot shorts in the instrumentation and control/penetration room.

Following detection of a fire in one of the dc equipment rooms, the operators will remove cabinet power from this division using the input power switches on the instrumentation and control cabinets. This operator action will prevent spurious smoke-induced actuation of motor operated valves and squib valves resulting smoke-related integrated circuit failures in the instrumentation and control room.

ASSUMPTIONS:

For any fire in these areas, input power to the entire fire area will be secured. It is highly unlikely that non-Class 1E cables would be the source of hot shorts resulting spurious ADS actuation; however, these actions also remove the non-Class 1E power to the fire areas. These areas include batteries. The operator actions listed in this analysis will minimize the probability of hot shorts from the batteries causing spurious ADS actuation.

This analysis assumes that the reactor operator (RO) performs the actions in the MCR and that an equipment operator (EO) is sent to perform the control actions outside the MCR. The analysis also assumes that the EO begins his tasks from the MCR. This analysis demonstrates that all external power can be removed from the fire areas within 30 minutes. The Class 1E batteries are located within these fire areas and are a potential source of power for spurious ADS actuation. The actions analyzed are those that are reasonable and will minimize the probability of the potential for spurious ADS actuation.

The analysis assumes the operator travels at a speed of at least 200 ft/min (61 m/min).

The analysis assumes that there are no vital access doors that need to be bypassed by security due to the fire.

The analysis assumes the operator will have unimpeded access to these areas without smoke or heat. The assumed starting state for these rooms has the door initially closed, containing the heat and smoke.

The analysis assumes the operator will not need SCBA or protective clothing for these actions.

The analysis assumes the operator will carry portable lighting sufficient to perform these actions even with normal lighting disabled by the fire.

For the analysis it is assumed the communication is not working and the RO must return to the MCR to verify the fire (see typical Step 3 in Tables 1 – 17).

CONCLUSIONS:

Tables 1 through 17 provide the analysis for the I&C rooms, the penetration rooms, the battery rooms, the dc switchgear rooms and the Division C reactor coolant pump switchgear room. No specific analysis is

provided for a fire in the MCR. The process of moving to the remote shutdown workstation and the switching action at the transfer switches minimizes the potential for spurious ADS with no additional action required.

The analysis concludes that operator actions which minimize the probability of the potential for spurious ADS actuation as a result of a fire can be accomplished within 30 minutes following detection of the fire.

The procedure for the manual actuation of the valve to allow fire water to reach the automatic fire system in the containment maintenance floor has been written (Reference 3).

Table 1 – Fire Starts in Division A I&C Room (12301) – Fire Area 1202 AF 04

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12301 (Division A I&C room) to verify the alarm. EO travels 120' (37 m) and down one flight of stairs using stairwell S01 from the MCR to room 12301.	3	3
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	7
4	RO identifies the power that needs to be secured.	2	9
5	RO orders power to be secured at the following power cabinets: EDS1-EA-1, IDSA-DC-1, IDSA-DF-1, and IDSA-DT-1. EO travels from MCR 120' (37 m) and down one flight of stairs using stairwell S01 to room 40308 and secures power to EDS1-EA-12 at EDS1-EA-1. EO then travels 100' (30 m) and down one flight of stairs using stairwell S01 to room 12201 to secure IDSA-DC-1, IDSA-DF-1 and IDSA-DT-1. While EO is performing remote operations, RO takes action from the MCR to open motor control center (MCC) circuit breakers to remove input power to IDSA-DC-1 and IDSA-DT-1.	7	16
6	After EO secures IDSA-DC-1, IDSA-DF-1 and IDSA-DT-1, EO travels 190' (58 m) and up one flight of stairs using stairwell S01 to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12101, 12201 and 12301).	6	22

Table 2 – Fire Starts in Division B I&C/Penetration Room (12304) – Fire Area 1201 AF 02

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12304 (Division B I&C/Penetration room) to verify the alarm. EO travels 185' (56 m) and down one flight of stairs using stairwell S01 from the MCR to room 12304.	4	4
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	8
4	RO identifies the power that needs to be secured.	2	10
5	RO orders power to be secured at the following power cabinets: IDSB-DC-1, IDSB-DF-1 and IDSB-DT-1. EO travels from MCR 175' (53 m) and down <u>two flights</u> of stairs using stairwell S01 to room 12204 to secure IDSB-DC-1, IDSB-DF-1 and IDSB-DT-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSB-DC-1 and IDSB-DT-1.	5	15
6	After EO secures <u>IDSB-DC-1, IDSB-DF-1 and IDSB-DT-1</u> , EO travels 250' (76 m) and up one flight of stairs using stairwell S01 to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12104, 12204, 12207 and 12304).	7	22

Table 3 – Fire Starts in Division C I&C Room (12302) – Fire Area 1202 AF 03

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12302 (Division C I&C room) to verify the alarm. EO travels 140' (43 m) and down one flight of stairs using stairwell S01 from the MCR to room 12302.	3	3
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	7
4	RO identifies the power that needs to be secured.	2	9
5	RO orders power to be secured at the following power cabinets: IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1. EO travels from MCR 110' (34 m) and down <u>two flights</u> of stairs using stairwell S01 to room 12203 to secure IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSC-DC-1 and IDSC-DT-1. RO also takes action from the MCR to open MCC circuit breakers to remove input power to lighting panels ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12102, 12202, 12203, 12302, 12312 and 12313).	4	13
6	After EO secures IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1, EO travels 210' (64 m) and up one flight of stairs using Stairwell S01 to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12102, 12202, 12203, 12302, 12312 and 12313).	6	19

Table 4 – Fire Starts in Division D I&C Room (12305) – Fire Area 1201 AF 03

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12305 (Division D I&C room) to verify the alarm. EO travels 205' (62 m) and down one flight of stairs using stairwell S01 from the MCR to room 12305.	4	4
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	8
4	RO identifies the power that needs to be secured.	2	10
5	RO orders power to be secured at the following power cabinets: EDS2-EA-1, IDSD-DC-1, IDSD-DF-1 and IDSD-DT-1. EO travels from MCR 100' (30 m) and down one flight of stairs using stairwell S01 to room 40310 and secures power to EDS2-EA-12 at EDS2-EA-1 then travels 150' (46 m) and down one flight of stairs using Stairwell S01 to room 12205 to secure IDSD-DC-1, IDSD-DF-1 and IDSD-DT-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSD-DC-1 and IDSD-DT-1.	8	18
6	After EO secures IDSD-DC-1, IDSD-DF-1 and IDSD-DT-1, EO travels 270' (82 m) and up one flight of stairs using Stairwell S01 to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12105, 12205 and 12305).	7	25

Table 5 – Fire Starts in Division A Battery Room (12101) – Fire Area 1202 AF 04

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12101 (Division A battery room) to verify the alarm. EO travels 100' (30 m) and down three flights of stairs using stairwell S01 from the MCR to room 12101.	3	3
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	7
4	RO identifies the power that needs to be secured.	2	9
5	RO orders power to be secured at the following power cabinets: EDS1-EA-1, IDSA-DC-1, IDSA-DF-1 and IDSA-DT-1. EO travels from MCR 100' (30 m) and down two flights of stairs using stairwell S01 to room 12201 to secure IDSA-DC-1, IDSA-DF-1 and IDSA-DT-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSA-DC-1 and IDSA-DT-1.	4	13
6	After EO secures IDSA-DC-1, IDSA-DF-1 and IDSA-DT-1, EO travels 100' (30 m) and up one flight of stairs using Stairwell S01 to room 40308 and secures power to EDS1-EA-12 at EDS1-EA-1 then travels 90' (27 m) to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12101, 12201 and 12301).	9	22

Table 6 – Fire Starts in Division B Battery Room 1 (12104) – Fire Area 1201 AF 02

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12104 (Division B battery room 1) to verify the alarm. EO travels 155' (47 m) and down three flights of stairs using stairwell S01 from the MCR to room 12104.	4	4
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	8
4	RO identifies the power that needs to be secured.	2	10
5	RO orders power to be secured at the following power cabinets: IDSB-DC-1, IDSB-DF-1 and IDSB-DT-1. EO travels from MCR 155' (47 m) and down two flights of stairs using stairwell S01 to room 12207 to secure IDSB-DC-1, IDSB-DF-1 and IDSB-DT-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSB-DC-1 and IDSB-DT-1	5	15
6	After EO secures IDSB-DC-1, IDSB-DF-1 and IDSB-DT-1, EO travels 230' (70 m) and up one flight of stairs using stairwell S01 to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12104, 12204, 12207 and 12304).	6	21

Table 7 – Fire Starts in Division B Battery Room 2 (12204) – Fire Area 1201 AF 02

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12204 (Division B battery room 2) to verify the alarm. EO travels 155' (47 m) and down two flights of stairs using stairwell S01 from the MCR to room 12204.	4	4
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	8
4	RO identifies the power that needs to be secured.	2	10
5	RO orders power to be secured at the following power cabinets: IDSB-DC-1, IDSB-DF-1 and IDSB-DT-1. EO travels <u>from MCR 155' (47 m) and down two flights of stairs using stairwell S01</u> to room 12207 to secure IDSB-DC-1, IDSB-DF-1 and IDSB-DT-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSB-DC-1 and IDSB-DT-1.	5	15
6	After EO secures <u>IDSB-DC-1, IDSB-DF-1 and IDSB-DT-1</u> , EO travels 230' (70 m) and up one flight of stairs using stairwell S01 to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12104, 12204, 12207 and 12304).	6	21

Table 8 – Fire Starts in Division C Battery Room 1 (12102) – Fire Area 1202 AF 03

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to Room 12102 (Division C battery room 1) to verify the alarm. EO travels 110' (34 m) and down three flights of stairs using stairwell S01 from the MCR to room 12102.	3	3
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	7
4	RO identifies the power that needs to be secured.	2	9
5	RO orders power to be secured at the following power cabinets: IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1. EO travels from MCR 110' (34 m) and down two flights of stairs using stairwell S01 to room 12203 to secure IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSC-DC-1 and IDSC-DT-1. RO also takes action from the MCR to open MCC circuit breakers to remove input power to lighting panels ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12102, 12202, 12203, 12302, 12312 and 12313).	4	13
6	After EO secures IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1, EO travels 210' (64 m) and up one flight of stairs using Stairwell S01 to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12102, 12202, 12203, 12302, 12312 and 12313)	6	19

Table 9 – Fire Starts in Division C Battery Room 2 (12202) – Fire Area 1202 AF 03

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12202 (Division C battery room 2) to verify the alarm. EO travels 110' (34 m) and down two flights of stairs using stairwell S01 from the MCR to room 12202.	3	3
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	7
4	RO identifies the power that needs to be secured.	2	9
5	RO orders power to be secured at the following power cabinets: IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1. EO travels from MCR 110' (34 m) and down two flights of stairs using stairwell S01 to room 12203 to secure IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSC-DC-1 and IDSC-DT-1. RO also takes action from the MCR to open MCC circuit breakers to remove input power to lighting panels ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12102, 12202, 12203, 12302, 12312 and 12313).	4	13
6	After EO secures IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1, EO travels 210' (64 m) and up one flight of stairs using Stairwell S01 to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12102, 12202, 12203, 12302, 12312 and 12313).	6	19

Table 10 – Fire Starts in Division D Battery Room (12105) – Fire Area 1201 AF 03

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12105 (Division D battery room) to verify the alarm. EO travels 175' (53 m) and down three flights of stairs using stairwell S01 from the MCR to room 12105.	4	4
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	8
4	RO identifies the power that needs to be secured.	2	10
5	RO orders power to be secured at the following power cabinets: IDSD-DC-1, IDSD-DF-1 and IDSD-DT-1. EO travels from MCR 175' (53 m) and down two flights of stairs using stairwell S01 to room 12205 to secure IDSD-DC-1, IDSD-DF-1 and IDSD-DT-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSD-DC-1 and IDSD-DT-1.	5	15
6	After EO secures IDSD-DC-1, IDSD-DF-1 and IDSD-DT-1, EO travels 150' (46 m) and up one flight of stairs using stairwell S01 to room 40310 and secures power to EDS2-EA-12 at EDS2-EA-1 then travels 120' (37 m) to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12105, 12205 and 12305).	9	24

Table 11 – Fire Starts in Division A DC Equipment Room (12201) – Fire Area 1202 AF 04

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12201 (Division A dc equipment room) to verify the alarm. EO travels 100' (30 m) and down two flights of stairs using stairwell S01 from the MCR to room 12201.	3	3
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	7
4	RO identifies the power that needs to be secured.	2	9
5	RO orders power to be secured at the following power cabinets: EDS1-EA-1, IDSA-DC-1, IDSA-DT-1, IDSA-EA-1, IDSA-EA-2 and at Division A PMS cabinets. EO travels from MCR 120' (37 m) and down one flight of stairs using stairwell S01 to room 40308 and secures power to EDS1-EA-12 at EDS1-EA-1 then travels 50' (15 m) to room 12301 to secure power to PMS cabinets at IDSA-EA-1, IDSA-EA-2 and at the input circuit breakers in the PMS cabinets. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSA-DC-1 and IDSA-DT-1.	8	17
6	After EO secures IDSA-EA-1, IDSA-EA-2 and PMS input switches, EO travels 60' (18 m) to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12101, 12201 and 12301).	5	22

Table 12 – Fire Starts in Division B DC Equipment Room (12207) – Fire Area 1201 AF 02

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12207 (Division B dc equipment room) to verify the alarm. EO travels 155' (47 m) and down two flights of stairs using stairwell S01 from the MCR to room 12207.	4	4
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	8
4	RO identifies the power that needs to be secured.	2	10
5	RO orders power to be secured at the following power cabinets: IDSB-DC-1, IDSB-DT-1, IDSB-EA-1, IDSB-EA-2, IDSB-EA-3 and at Division B PMS cabinets. EO travels from MCR 185' (56 m) and down one flight of stairs using stairwell S01 to room 12304 to secure power to PMS cabinets at IDSB-EA-1, IDSB-EA-2, IDSB-EA-3 and at the input circuit breakers in the PMS cabinets. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSB-DC-1 and IDSB-DT-1.	8	18
6	After EO secures IDSB-EA-1, IDSB-EA-2, IDSB-EA-3 and PMS input switches, EO travels 85' (26 m) to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12104, 12204, 12207 and 12304).	5	23

Table 13 – Fire Starts in Division C DC Equipment Room (12203) – Fire Area 1202 AF 03

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12203 (Division C dc equipment room) to verify the alarm. EO travels 110' (43 m) and down two flights of stairs using stairwell S01 from MCR to room 12203.	3	3
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	7
4	RO identifies the power that needs to be secured.	2	9
5	RO orders power to be secured at the following power cabinets: IDSC-DC-1, IDSC-DT-1, IDSC-EA-1, IDSC-EA-2, IDSC-EA-3 and at Division C PMS cabinets. EO travels from MCR 140' (43 m) and down one flight of stairs using stairwell S01 to room 12302 to secure power to PMS cabinets at IDSC-EA-1, IDSC-EA-2, IDSC-EA-3 and at the input circuit breakers in the PMS cabinets. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSB-DC-1 and IDSB-DT-1. RO also takes action from the MCR to open MCC circuit breakers to remove input power to lighting panels ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12102, 12202, 12203, 12302, 12312 and 12313).	8	17
6	After EO secures IDSC-EA-1, IDSC-EA-2, IDSC-EA-3 and PMS input switches, EO travels 20' (6 m) to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12102, 12202, 12203, 12302, 12312 and 12313).	5	22

Table 14 – Fire Starts in Division D DC Equipment Room (12205) – Fire Area 1201 AF 03

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12205 (Division D dc equipment room) to verify the alarm. EO travels 175' (53 m) and down two flights of stairs using stairwell S01 from the MCR to room 12205.	4	4
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	8
4	RO identifies the power that needs to be secured.	2	10
5	RO orders power to be secured at the following power cabinets: EDS2-EA-1, IDSD-DC-1, IDSD-DT-1, IDSD-EA-1, IDSD-EA-2 and at Division D PMS cabinets. EO travels from MCR 205' (62 m) and down one flight of stairs using stairwell S01 to room 12305 to secure power to PMS cabinets at IDSD-EA-1, IDSD-EA-2 and at the input circuit breakers in the PMS cabinets. EO then travels 100' (30 m) to room 40310 and secures power to EDS1-EA-12 at EDS1-EA-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSD-DC-1 and IDSD-DT-1.	8	18
6	After EO secures EDS1-EA-1, EO travels 120' (37 m) to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12105, 12205 and 12305).	5	23

Table 15 – Fire Starts in Division A Penetration Room (12412) – Fire Area 1242 AF 02

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12412 (Division A penetration room) to verify the alarm. EO travels 40' (12 m) from the MCR to room 12412.	2	2
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	2	4
4	RO identifies the power that needs to be secured.	2	6
5	RO orders power to be secured at the following power cabinets: IDSA-DC-1, IDSA-DF-1 and IDSA-DT-1. EO travels from MCR 100' (30 m) and down two flights of stairs using Stairwell S01 to room 12201 to secure IDSA-DC-1, IDSA-DF-1 and IDSA-DT-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSA-DC-1 and IDSA-DT-1	3	9
6	After EO secures IDSA-DC-1, IDSA-DF-1 and IDSA-DT-1 EO travels 190' (58 m) and up one flight of stairs using Stairwell S01 to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to room 12412).	6	15

Table 16 – Fire Starts in Division C Penetration Room (12313) – Fire Area 1202 AF 03

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12313 (Division C penetration room) to verify the alarm. EO travels <u>160' (49 m)</u> and down one flight of stairs using stairwell S01 from the MCR to room 12313.	4	4
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	8
4	RO identifies the power that needs to be secured.	2	10
5	RO orders power to be secured at the following power cabinets: IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1. EO travels <u>from MCR 110' (34 m)</u> and down <u>two flights</u> of stairs using stairwell S01 to room 12203 to secure IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1. While EO is performing remote operations, RO takes action from the MCR to remove input power to IDSC-DC-1 and IDSC-DT-1. RO also takes action from the MCR to open MCC circuit breakers to remove input power to lighting panels ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12102, 12202, 12203, 12302, 12312 and 12313).	4	14

Table 17 – Fire Starts in Division C Reactor Coolant Pump Switchgear Room (12312) – Fire Area 1202 AF 03

Step	Situation Description	Minutes	Total Minutes
1	Fire alarm activates	0	0
2	RO sends EO to room 12312 (Division C reactor coolant pump switchgear room) to verify the alarm. EO travels 50' (15 m) and down one flight of stairs using stairwell S01 from the MCR to room 12312.	3	3
3	EO verifies the alarm, and reports back to the MCR by using plant communication system (telephone or sound power phone), or travels back to the MCR to report the situation when the plant communication system is not available.	4	7
4	RO identifies the power that needs to be secured.	2	9
5	RO orders power to be secured at the following power cabinets: IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1. EO travels <u>from MCR 110' (34 m)</u> and down <u>two flights</u> of stairs using stairwell S01 to room 12203 to secure IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1. While EO is performing remote operations, RO takes action from the MCR to open MCC circuit breakers to remove input power to IDSC-DC-1 and IDSC-DT-1. RO also takes action from the MCR to open MCC circuit breakers to remove input power to lighting panels ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12102, 12202, 12203, 12302, 12312 and 12313).	4	13
6	After EO secures <u>IDSC-DC-1, IDSC-DF-1 and IDSC-DT-1</u> , EO travels <u>210' (64 m)</u> and up one flight of stairs using Stairwell S01 to room 12313 to secure ELS-EA-1211 and ELS-EA-2211 (lighting to rooms 12102, 12202, 12203, 12302, 12312 and 12313).	6	19

REGULATORY IMPACT:

The AP1000 FSER (Reference 2) in Subsection 9.5.1.5c discusses the alternative or dedicated shutdown capability of AP1000. Using this analysis for generic closure of COL Information Item 9.5-5 does not alter the conclusions in FSER Subsection 9.5.1.5c.

This report does not include any change to:

- a System, Structure, or Component (SSC)
- a procedure
- a DCD-described evaluation methodology
- a test or experiment not described in the DCD where an SSC is utilized or controlled in a manner that is outside the reference bounds of the design for that SSC or is inconsistent with analyses or descriptions in the DCD

As a result, the changes to the DCD presented in this report do not represent an adverse change to the design function or to how design functions are performed or controlled. The changes to the DCD do not involve revising or replacing a DCD-described evaluation methodology nor involve a test or experiment not described in the DCD. The DCD change does not require a license amendment per the criteria of VIII. B. 5.b. of Appendix D to 10 CFR Part 52.

SEVERE ACCIDENT CHANGE CRITERIA

The DCD change does not affect resolution of a severe accident issue and does not require a license amendment based on the criteria of VIII. B. 5.c of Appendix D to 10 CFR Part 52. Mitigation features are not impacted.

SECURITY

The subject changes will not alter barriers or alarms that control access to protected areas of the plant, and will not alter requirements for security personnel. Therefore, the proposed change does not have an adverse impact on the security assessment of the AP1000.

REFERENCES:

1. APP-GW-GL-700, AP1000 Design Control Document, Revision 15.
2. NUREG-1793, Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design, September 2004.
3. APP-GW-GJP-305, AP1000 Fire Emergency Response (AOP), Revision B, June 2006.

DCD MARK-UP

The following DCD markups identify how COL application FSARs should be prepared to incorporate the subject change.

Revise subsection 9.5.1.8 as follows:

9.5.1.8 Combined License Information

~~The Combined License applicant will provide an analysis that demonstrates that operator actions which minimize the probability of the potential for spurious ADS actuation as a result of a fire can be accomplished within 30 minutes following detection of the fire and the procedure for the manual actuation of the valve to allow fire water to reach the automatic fire system in the containment maintenance floor.~~
The operator actions which minimize the probability of the potential for spurious ADS actuation as a result of a fire have been analyzed. The analysis concludes that these actions can be accomplished within 30 minutes following the detection of the fire. The procedure for manual actuation of the valve to allow fire water to reach the automatic fire system in the containment maintenance floor has been written.