

ARC FLASH EVALUATION STUDY PLASTIPAK CHAMPAIGN, MAY 2008

SUMMARY

The following is an outline of the results of the Arc Flash Study conducted at Plastipak Packaging, Inc. located in Champaign, IL. All major component groups are categorized by flash category as defined by the latest published revision of the NFPA 70E code.

BACKGROUND

Plastipak Packaging, Inc. is served from the local utility Illinois Power (at 69 kV) to two main utility transformers. The main utility transformers are 15MVA with an output voltage of 12,470 volts. These two transformers then feed six 2500 kVA transformers and seven 3500 kVA transformers which all have an output voltage of 480 volts. There is one additional 3000 kVA transformer which has an output voltage of 4,160 volts and feeds four chillers.

PROJECT SCOPE

The primary focus of this project is to provide an assessment of the facility's distribution system relative to short circuit faults and an arc flash safety analysis relative to current NFPA 70E standards. The scope of this project was as follows:

1. A site survey of the facility was conducted. For each transformer, information was gathered relative to the transformers, medium voltage cable sizes and lengths, feeder lengths to panelboards, fuse sizes, feeder lengths to circuit breaker and control panels.
2. A comprehensive short circuit study was performed for the facility. This study extended to include the following major system components:
 - a. Main 69 kV service supply
 - b. Each 69 kV to 12,470 V substation (two)
 - c. Each 12,470 V to 480 V substations (thirteen)
 - d. Each 12,470 V to 4,160 V substation (one)
 - e. Each 480 V distribution panel.
 - f. Each 480 busway. Each busway was modeled with a standard fuse type.
 - g. Representative branch circuit panels in the plant.
3. Using SKM Power Tools (version 6.0), a computer model of the distribution system was prepared in order to calculate the short circuit values for use in the flash hazard analysis.
4. Using the short circuit study and recorded device trip settings as a basis, a flash hazard analysis was prepared for each main supply bus, 480-volt distribution panels, and busways. For power distribution panels and busways, a worst-case fault value was used to evaluate the flash hazard in panel insert modules (buckets). Standard fuse ratings were identified where applicable to enable Plastipak Packaging, Inc. to establish a flash protection standard for all distribution panels and busways.

5. This report has been assembled in an effort to outline the actual flash hazard calculation results, including flash intensity, flash boundaries and various PPE alternatives for review by Plastipak Packaging, Inc. personnel. This report data can be used to identify and group hazard levels.

ANALYSIS

SYSTEM MODELING

The first step was to perform a site survey of the facility. For each substation, information was gathered and entered into a system model using SKM Power Tools (Version 6.0) system analysis software. Using this model, a comprehensive short circuit study was performed. This study included the 69KV, switchgear, 12,470 V equipment, the 480 switchgear, each 480 Volt distribution panel and busways, as well as branch circuit panels. The study calculated fault values for instantaneous asymmetrical, 1/2 cycle, three cycle, five cycle, eight cycle and steady state symmetrical. The results of this study are included under this cover.

Using the short circuit study and the same SKM software, a flash hazard analysis was prepared for each main supply bus, 480 volt bus, power distribution panel and busway. The results of this study have also been included under this and a separate cover.

The remainder of this section of the report is a summary of the conditions revealed by the flash analysis simulation. The results have been assembled and summarized by substation in an effort to outline group hazard levels. The philosophy behind grouping is fashioned to ease the burden of identifying individual PPE levels for each component of a motor control center or power distribution panel. It groups the components into a system and requires one level of protection at the worst-case level for the entire panel. This reduces the risk of improper protection due to an error in identification of hazard levels.

PPE DEFINITIONS

The following table gives a listing of PPE definitions as defined by the NFPA 70E code. This table can be used to reference the descriptions outlined in the following pages where the individual substation PPE levels are outlined. The color codes can be used as a quick visual reference when viewing the substation tables.

PPE DEFINITIONS

PPE Level	Calorie Rating	Required Clothing
0	0 to 1.2 cal/cm ²	Eye Protection, Ear Protection, 4.5 - 14.0 oz/yd ² untreated cotton
1	>1.2 to 4 cal/cm ²	Face Protection, Ear Protection, 8 cal/cm ² FR shirt and pants plus cotton underclothing
2	>4 to 8 cal/cm ²	Face Protection, Ear Protection, 8 cal/cm ² FR shirt and pants plus cotton underclothing
3	>8 to 25 cal/cm ²	Face Protection, Ear Protection, 65 cal/cm ² arc flash suit plus cotton underclothing
4	>25 to 40 cal/cm ²	Face Protection, Ear Protection, 65 cal/cm ² arc flash suit plus cotton underclothing
>4	> 40 to 65 cal/cm ²	Face Protection, Ear Protection, 65 cal/cm ² arc flash suit plus cotton underclothing
N/A	Above 65 cal/cm ²	No Access while energized

Table 1 – PPE Definitions

ANALYSIS RESULTS

The following tables outline the various findings for the Facility 69 kV system and each Main Distribution Panel. All ID names can be correlated to a node in the SKM ARC Flash single line included in the main report tabbed report sections.

The values listed in the tables below are the worst-case conditions from amongst all the three scenarios analyzed, thus insuring that the highest safety level is utilized when donning PPE.

An area for review would be the fusing on the main transformers feeding each substation. Several of the substations are Category N/A and could possibly be lowered with different primary fusing.

FACILITY 69 kV SYSTEM

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
15 MVA-1 FEED	69.00	18	11.94	N/A	Air	11.73	19817
15 MVA-1 PRI	69.00	18	11.94	N/A	In Box	11.85	83
15 MVA-2 FEED	69.00	18	11.94	N/A	Air	11.73	19817
15 MVA-2 PRI	69.00	18	11.94	N/A	In Box	11.88	80
UTILITY BUS	69.00	18	11.95	N/A	In Box	11.74	19829

Table 2 – 69 kV System PPE Requirements

MODS-1 12.47 kV SYSTEM

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
MODS-1	12.47	36	7.87	Category 4	In Box	7.36	31
CIRCUIT-041 720 FUSE	12.47	36	7.87	Category 3	In Box	7.48	17
CIRCUIT-042 720 FUSE	12.47	36	7.87	Category 3	In Box	7.75	16
ODS-3	12.47	36	6.97	Category 3	In Box	6.85	18
ODS-4	12.47	36	6.97	Category 3	In Box	6.84	18
POLE #2174356	12.47	36	7.85	Category 3	In Box	7.46	17
POLE #2174357	12.47	36	7.84	Category 3	In Box	7.71	16
POLE #2174365	12.47	36	7.07	Category 3	In Box	6.94	17
POLE #2174368	12.47	36	6.99	Category 3	In Box	6.6	19
POLE #2174369	12.47	36	6.99	Category 3	In Box	6.59	19
ODS-1	12.47	36	6.95	Category 1	In Box	6.94	3.2
ODS-2	12.47	36	6.79	Category 1	In Box	6.79	3.3
POLE #68 140 FUSE1	12.47	36	6.99	Category 1	In Box	6.98	3.2
POLE #68 140 FUSE2	12.47	36	6.99	Category 1	In Box	6.99	3.2
XFMR USS-4 PRI	12.47	36	6.82	Category 1	In Box	6.82	1.5
XFMR-1 140 FUSE	12.47	36	6.99	Category 1	In Box	6.6	3.5
XFMR-1 PRI	12.47	36	6.95	Category 1	In Box	6.57	3.5
XFMR-2 140 FUSE	12.47	36	6.99	Category 1	In Box	6.99	3.2
XFMR-2 PRI	12.47	36	6.94	Category 1	In Box	6.94	3.2
USS-1 200 FUSE	12.47	36	6.95	Category 0	In Box	6.94	1.1
USS-1 200 FUSE1	12.47	36	6.79	Category 0	In Box	6.78	1.1
USS-2 200 FUSE	12.47	36	6.95	Category 0	In Box	6.95	1.1
USS-2 200 FUSE1	12.47	36	6.62	Category 0	In Box	6.62	1.1
USS-3 200 FUSE	12.47	36	6.79	Category 0	In Box	6.79	1.1
USS-3 200 FUSE1	12.47	36	6.6	Category 0	In Box	6.6	1.1
USS-4 250 FUSE	12.47	36	6.97	Category 0	In Box	6.97	0.72
USS-4 250 FUSE1	12.47	36	6.82	Category 0	In Box	6.82	0.74
XFMR USS-1 PRI	12.47	36	6.79	Category 0	In Box	6.78	1.1
XFMR USS-2 PRI	12.47	36	6.62	Category 0	In Box	6.62	1.1
XFMR USS-3 PRI	12.47	36	6.6	Category 0	In Box	6.6	1.1
XFMR-3 200 FUSE	12.47	36	6.79	Category 0	In Box	6.79	1.1
XFMR-3 PRI	12.47	36	6.74	Category 0	In Box	6.74	1.1

XFMR-4 250 FUSE	12.47	36	6.97	Category 0	In Box	6.85	0.75
XFMR-4 PRI	12.47	36	6.95	Category 0	In Box	6.82	0.75
XFMR-5 250 FUSE	12.47	36	6.97	Category 0	In Box	6.97	0.71
XFMR-5 PRI	12.47	36	6.93	Category 0	In Box	6.93	0.72

Table 3 – MODS-1 12.47 kV System PPE Requirements

MODS-2 12.47 kV SYSTEM

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
CIRCUIT-043 720 FUSE	12.47	36	8.39	Category 3	In Box	8.04	16
MODS-2	12.47	36	8.39	Category 3	In Box	8.04	25
POLE #2174358	12.47	36	8.34	Category 3	In Box	7.99	16
POLE #2174361	12.47	36	7.8	Category 3	In Box	7.48	17
POLE #2174362	12.47	36	7.66	Category 3	In Box	7.33	17
POLE #2174363	12.47	36	7.66	Category 3	In Box	7.32	17
POLE #61 200 FUSE	12.47	36	7.8	Category 2	In Box	7.8	7.1
POLE #62 200 FUSE	12.47	36	7.66	Category 2	In Box	7.55	6.7
POLE #63 200 FUSE1	12.47	36	7.66	Category 2	In Box	7.42	6.8
POLE #63 200 FUSE2	12.47	36	7.66	Category 2	In Box	7.66	6.5
USS-5 250 FUSE	12.47	36	7.14	Category 2	In Box	6.89	7.1
USS-6 250 FUSE	12.47	36	7.35	Category 2	In Box	7.35	6.7
USS-7 250 FUSE	12.47	36	7.08	Category 2	In Box	6.97	6.9
USS-8 - USS-9	12.47	36	7.23	Category 2	In Box	7.23	7.3
XFMR USS-5 PRI	12.47	36	7.14	Category 1	In Box	6.89	1.5
XFMR USS-6 PRI	12.47	36	7.35	Category 1	In Box	7.35	1.4
XFMR USS-7 PRI	12.47	36	7.08	Category 1	In Box	6.97	1.5
XFMR USS-8 PRI	12.47	36	7.22	Category 1	In Box	7.22	2.2
USS-9 200 FUSE1	12.47	36	7.22	Category 0	In Box	7.22	1.0
USS-9 200 FUSE2	12.47	36	7.2	Category 0	In Box	7.2	1.0
XFMR USS-9 PRI	12.47	36	7.18	Category 0	In Box	7.18	1.0

Table 4 – MODS-2 12.47 kV System PPE Requirements

USS-1

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
L-061 MAIN POWER	0.38	18	12.17	N/A	In Box	4.62	119
USS-1	0.48	18	40.34	N/A	In Box	15.21	387
USS-1 3000 FUSE	0.48	18	40.36	N/A	In Box	15.22	388
XFMR L-061 MAIN POWER SEC	0.38	18	12.45	N/A	In Box	4.73	122
XFMR USS-1 SEC	0.48	18	40.46	N/A	In Box	15.26	389
MINI GEM BUS DUCT-1	0.48	18	28.43	Category 3	In Box	10.8	15
POLY BUS DUCT-1	0.48	18	31.58	Category 3	In Box	12	10

POLY BUS DUCT-2	0.48	18	27.07	Category 3	In Box	10.29	12
POLY BUS DUCT-3	0.48	18	24.88	Category 3	In Box	9.34	23
POLY BUS DUCT-3 600	0.48	18	19.56	Category 3	In Box	7.43	9.8
MINI GEM BUS DUCT-1 FEED	0.48	18	40.23	Category 2	In Box	15.29	4.6
MINI GEM BUS-1 600	0.48	18	21.74	Category 2	In Box	8.26	5.0
POLY BUS DUCT-1 FEED	0.48	18	40.23	Category 2	In Box	15.29	4.6
POLY BUS DUCT-2 600	0.48	18	20.91	Category 2	In Box	7.95	6.4
POLY BUS DUCT-3 FEED	0.48	18	40.23	Category 2	In Box	15.17	4.7
MINI GEM BUS-1 600 FUSE	0.48	18	28.34	Category 1	In Box	10.77	2.5
POLY BUS DUCT-1 600	0.48	18	23.58	Category 1	In Box	8.96	3.8
POLY BUS DUCT-1 600 FUSE	0.48	18	31.47	Category 1	In Box	11.96	1.9
POLY BUS DUCT-2 400	0.48	18	17.63	Category 1	In Box	6.7	1.3
POLY BUS DUCT-2 600 FUSE	0.48	18	26.99	Category 1	In Box	10.26	2.7
POLY BUS DUCT-2 FEED	0.48	18	40.23	Category 1	In Box	15.29	1.3
POLY BUS DUCT-3 400	0.48	18	16.66	Category 1	In Box	6.33	1.5
POLY BUS DUCT-3 600 FUSE	0.48	18	24.81	Category 1	In Box	9.43	3.3
XFMR L-061 MAIN POWER PRI	0.48	24	20.29	Category 1	In Box	7.71	3.9
40 HP GRINDER	0.48	18	4.23	Category 0	In Box	4.1	0.18
ALPINE EXIT	0.208	18	0.43	Category 0	In Box	0.42	0.94
ALPINE MCC	0.48	18	2.08	Category 0	In Box	2.08	0.09
ALPINE REAMER INFEED	0.208	18	0.43	Category 0	In Box	0.42	0.94
CAPACITOR BANKS 3 & 4	0.48	18	38.45	Category 0	In Box	38.45	0.94
CAPACITOR BANKS 3 & 4 FEED	0.48	18	40.16	Category 0	In Box	40.16	1.0
CONV. OUTLETS	0.208	18	0.42	Category 0	In Box	0.42	0.93
L-061 MAIN POWER 800 FEED	0.48	18	40.16	Category 0	In Box	40.16	1.0
LYLE BLOW OFF SOLENOID	0.208	18	0.42	Category 0	In Box	0.42	0.93
LYLE INFEED CONV	0.208	18	0.43	Category 0	In Box	0.42	0.94
LYLE LEAK DETECTOR	0.208	18	0.42	Category 0	In Box	0.42	0.93
LYLE TRIMMER	0.48	18	1.37	Category 0	In Box	0.52	0.42
MINI GEM BUS-1 100	0.48	18	7.14	Category 0	In Box	7.14	0.18
MINI GEM BUS-1 100 FUSE	0.48	18	27.95	Category 0	In Box	27.95	0.53
MINI GEM BUS-1 200	0.48	18	15.11	Category 0	In Box	15.11	0.39
MINI GEM BUS-1 200 FUSE	0.48	18	28.21	Category 0	In Box	28.21	0.53
MINI GEM BUS-1 30	0.48	18	2.24	Category 0	In Box	2.24	0.06
MINI GEM BUS-1 30 FUSE	0.48	18	26.99	Category 0	In Box	26.99	0.50
MINI GEM BUS-1 400	0.48	18	18.21	Category 0	In Box	6.92	1.2
MINI GEM BUS-1 400 FUSE	0.48	18	28.27	Category 0	In Box	28.27	0.53
MINI GEM BUS-1 60	0.48	18	4.86	Category 0	In Box	4.86	0.13
MINI GEM BUS-1 60 FUSE	0.48	18	27.75	Category 0	In Box	27.75	0.52
POLY BUS DUCT-1 100	0.48	18	7.31	Category 0	In Box	7.31	0.19

POLY BUS DUCT-1 100 FUSE	0.48	18	31.02	Category 0	In Box	31.02	0.62
POLY BUS DUCT-1 200	0.48	18	16.01	Category 0	In Box	16.01	0.41
POLY BUS DUCT-1 200 FUSE	0.48	18	31.32	Category 0	In Box	31.32	0.63
POLY BUS DUCT-1 30	0.48	18	2.26	Category 0	In Box	2.26	0.06
POLY BUS DUCT-1 30 FUSE	0.48	18	29.92	Category 0	In Box	29.92	0.58
POLY BUS DUCT-1 400	0.48	18	19.5	Category 0	In Box	7.41	1.00
POLY BUS DUCT-1 400 FUSE	0.48	18	31.39	Category 0	In Box	31.39	0.63
POLY BUS DUCT-1 60	0.48	18	4.94	Category 0	In Box	4.94	0.13
POLY BUS DUCT-1 60 FUSE	0.48	18	30.79	Category 0	In Box	30.79	0.61
POLY BUS DUCT-2 100	0.48	18	7.05	Category 0	In Box	7.05	0.18
POLY BUS DUCT-2 100 FUSE	0.48	18	26.62	Category 0	In Box	26.62	0.49
POLY BUS DUCT-2 200	0.48	18	14.7	Category 0	In Box	14.7	0.38
POLY BUS DUCT-2 200 FUSE	0.48	18	26.87	Category 0	In Box	26.87	0.50
POLY BUS DUCT-2 30	0.48	18	2.24	Category 0	In Box	2.24	0.06
POLY BUS DUCT-2 30 FUSE	0.48	18	25.73	Category 0	In Box	25.73	0.48
POLY BUS DUCT-2 400 FUSE	0.48	18	26.93	Category 0	In Box	26.93	0.50
POLY BUS DUCT-2 60	0.48	18	4.83	Category 0	In Box	4.83	0.12
POLY BUS DUCT-2 60 FUSE	0.48	18	26.43	Category 0	In Box	26.43	0.49
POLY BUS DUCT-3 100	0.48	18	6.91	Category 0	In Box	6.91	0.18
POLY BUS DUCT-3 100 BKR	0.208	18	1.2	Category 0	In Box	1.16	1.2
POLY BUS DUCT-3 100 FUSE	0.48	18	24.48	Category 0	In Box	24.48	0.45
POLY BUS DUCT-3 200	0.48	18	14	Category 0	In Box	14	0.36
POLY BUS DUCT-3 200 FUSE	0.48	18	24.7	Category 0	In Box	24.7	0.46
POLY BUS DUCT-3 200 FUSE1	0.48	18	24.71	Category 0	In Box	24.41	0.46
POLY BUS DUCT-3 208 20 BKR1	0.208	18	1.18	Category 0	In Box	0.45	0.84
POLY BUS DUCT-3 208 20 BKR2	0.208	18	1.18	Category 0	In Box	0.45	0.84
POLY BUS DUCT-3 208 20 BKR3	0.208	18	1.18	Category 0	In Box	0.44	0.87
POLY BUS DUCT-3 208 20 BKR4	0.208	18	1.18	Category 0	In Box	0.44	0.87
POLY BUS DUCT-3 208 20 BKR5	0.208	18	1.18	Category 0	In Box	0.45	0.84
POLY BUS DUCT-3 208 20 BKR6	0.208	18	1.18	Category 0	In Box	0.44	0.87
POLY BUS DUCT-3 208 20 BKR7	0.208	18	1.18	Category 0	In Box	0.45	0.84
POLY BUS DUCT-3 208 50 BKR	0.208	18	1.19	Category 0	In Box	0.45	1.2
POLY BUS DUCT-3 208 PNL	0.208	18	1.2	Category 0	In Box	1.15	1.2
POLY BUS DUCT-3 30	0.48	18	2.22	Category 0	In Box	2.22	0.06
POLY BUS DUCT-3 30 FUSE	0.48	18	23.7	Category 0	In Box	23.7	0.44
POLY BUS DUCT-3 400 FUSE	0.48	18	24.75	Category 0	In Box	9.41	0.53
POLY BUS DUCT-3 480 20 BKR1	0.48	18	13.32	Category 0	In Box	13.32	0.58

POLY BUS DUCT-3 480 20 BKR2	0.48	18	13.32	Category 0	In Box	13.32	0.58
POLY BUS DUCT-3 480 20 BKR3	0.48	18	13.32	Category 0	In Box	13.32	0.58
POLY BUS DUCT-3 480 20 BKR4	0.48	18	13.32	Category 0	In Box	13.32	0.58
POLY BUS DUCT-3 480 30 BKR1	0.48	18	13.61	Category 0	In Box	13.61	0.59
POLY BUS DUCT-3 480 30 BKR2	0.48	18	13.61	Category 0	In Box	13.61	0.59
POLY BUS DUCT-3 480 60 BKR1	0.48	18	13.92	Category 0	In Box	13.67	0.60
POLY BUS DUCT-3 480 60 BKR2	0.48	18	13.91	Category 0	In Box	13.88	0.60
POLY BUS DUCT-3 480 PNL	0.48	18	14.17	Category 0	In Box	13.9	0.37
POLY BUS DUCT-3 60	0.48	18	4.76	Category 0	In Box	4.76	0.12
POLY BUS DUCT-3 60 FUSE	0.48	18	24.31	Category 0	In Box	24.31	0.45
REAMER	0.48	18	2.08	Category 0	In Box	2.08	0.09
SPOUT INSERTER	0.48	18	1.37	Category 0	In Box	0.52	0.42
VISION SYSTEM	0.208	18	0.42	Category 0	In Box	0.42	0.93
WELDER OUTLET	0.208	18	0.67	Category 0	In Box	0.67	1.2
XFMR POLY BUS DUCT-3 PRI	0.48	24	4.14	Category 0	In Box	4.12	0.12
XFMR POLY BUS DUCT-3 SEC	0.208	18	1.7	Category 0	In Box	1.65	1.2

Table 5 – USS-1PPE Requirements

USS-2

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
L-046 MAIN POWER	0.38	18	7.2	N/A	In Box	2.74	71
L-048 MAIN POWER	0.38	18	12.07	N/A	In Box	4.59	118
L-063 MAIN POWER	0.38	18	10.73	N/A	In Box	4.08	105
USS-2	0.48	18	39.83	N/A	In Box	15.14	385
USS-2 3000 FUSE	0.48	18	39.85	N/A	In Box	15.14	385
XFMR L-046 MAIN POWER SEC	0.38	18	7.34	N/A	In Box	2.79	72
XFMR L-048 MAIN POWER SEC	0.38	18	12.34	N/A	In Box	4.69	121
XFMR L-063 MAIN POWER SEC	0.38	18	11.23	N/A	In Box	4.27	110
XFMR USS-2 SEC	0.48	18	39.95	N/A	In Box	15.18	386
SIDEL BUS DUCT-1	0.48	18	18.69	Category >4	In Box	7.1	46
HUSKY BUS DUCT-1 600	0.48	18	15.82	Category 4	In Box	6.01	31
SIDEL BUS DUCT-1 600	0.48	18	15.48	Category 4	In Box	5.88	34
HUSKY BUS DUCT-1	0.48	18	19.22	Category 3	In Box	7.3	20
HUSKY BUS DUCT-1 600 FUSE	0.48	18	19.18	Category 3	In Box	7.29	11
HUSKY BUS DUCT-2	0.48	18	25.69	Category 3	In Box	9.76	14
HUSKY BUS DUCT-2 600	0.48	18	20.03	Category 3	In Box	7.61	8.5
L-046 MAIN POWER 400 FEED	0.48	18	18.64	Category 3	In Box	7.08	13

SIDEL BUS DUCT-1 600 FUSE	0.48	18	18.65	Category 3	In Box	7.09	13
XFMR L-046 MAIN POWER PRI	0.48	24	17.77	Category 3	In Box	6.75	12
SIDEL BUS DUCT-1 1000 FEED	0.48	18	39.72	Category 2	In Box	15.1	4.8
SIDEL BUS DUCT-2	0.48	18	30.07	Category 2	In Box	11.43	7.1
SIDEL BUS DUCT-2 600	0.48	18	22.66	Category 2	In Box	8.61	4.2
HUSKY BUS DUCT-1 400	0.48	18	13.87	Category 1	In Box	5.27	2.4
HUSKY BUS DUCT-2 1200 FEED	0.48	18	39.75	Category 1	In Box	15.1	1.9
HUSKY BUS DUCT-2 400	0.48	18	17	Category 1	In Box	6.46	1.4
HUSKY BUS DUCT-2 600 FUSE	0.48	18	25.62	Category 1	In Box	9.74	3.1
SIDEL BUS DUCT-1 400	0.48	18	13.61	Category 1	In Box	5.17	2.5
SIDEL BUS DUCT-2 1200 FEED	0.48	18	39.75	Category 1	In Box	15.1	1.9
SIDEL BUS DUCT-2 600 FUSE	0.48	18	29.97	Category 1	In Box	11.39	2.1
CROSS TIE TO USS-4	0.48	18	34.98	Category 0	In Box	34.98	0.77
CROSS TIE TO USS-4 FEED	0.48	18	39.67	Category 0	In Box	39.67	1.0
HUSKY BUS DUCT-1 100	0.48	18	6.35	Category 0	In Box	6.35	0.16
HUSKY BUS DUCT-1 100 FUSE	0.48	18	18.95	Category 0	In Box	18.95	0.41
HUSKY BUS DUCT-1 1000 FEED	0.48	18	39.75	Category 0	In Box	39.75	1.0
HUSKY BUS DUCT-1 200	0.48	18	11.86	Category 0	In Box	11.86	0.31
HUSKY BUS DUCT-1 200 FUSE	0.48	18	19.11	Category 0	In Box	19.11	0.41
HUSKY BUS DUCT-1 30	0.48	18	2.17	Category 0	In Box	2.17	0.06
HUSKY BUS DUCT-1 30 FUSE	0.48	18	18.37	Category 0	In Box	18.37	0.41
HUSKY BUS DUCT-1 400 FUSE	0.48	18	19.15	Category 0	In Box	7.28	1.0
HUSKY BUS DUCT-1 60	0.48	18	4.5	Category 0	In Box	4.5	0.12
HUSKY BUS DUCT-1 60 FUSE	0.48	18	18.82	Category 0	In Box	18.82	0.41
HUSKY BUS DUCT-2 100	0.48	18	6.91	Category 0	In Box	6.91	0.18
HUSKY BUS DUCT-2 100 FUSE	0.48	18	25.26	Category 0	In Box	25.26	0.47
HUSKY BUS DUCT-2 200	0.48	18	14.17	Category 0	In Box	14.17	0.37
HUSKY BUS DUCT-2 200 FUSE	0.48	18	25.51	Category 0	In Box	25.51	0.47
HUSKY BUS DUCT-2 30	0.48	18	2.22	Category 0	In Box	2.22	0.06
HUSKY BUS DUCT-2 30 FUSE	0.48	18	24.37	Category 0	In Box	24.37	0.45
HUSKY BUS DUCT-2 400 FUSE	0.48	18	25.57	Category 0	In Box	9.72	0.49
HUSKY BUS DUCT-2 60	0.48	18	4.76	Category 0	In Box	4.76	0.12
HUSKY BUS DUCT-2 60 FUSE	0.48	18	25.06	Category 0	In Box	25.06	0.46
L-048 MAIN POWER 800 FEED	0.48	18	39.68	Category 0	In Box	39.68	1.0
L-063 MAIN POWER	0.48	18	18.64	Category 0	In Box	18.64	0.76

800 FEED							
SIDEL BUS DUCT-1 100	0.48	18	6.37	Category 0	In Box	6.37	0.16
SIDEL BUS DUCT-1 100 FUSE	0.48	18	18.44	Category 0	In Box	18.44	0.41
SIDEL BUS DUCT-1 200	0.48	18	11.74	Category 0	In Box	11.74	0.30
SIDEL BUS DUCT-1 200 FUSE	0.48	18	18.59	Category 0	In Box	18.59	0.41
SIDEL BUS DUCT-1 30	0.48	18	2.17	Category 0	In Box	2.17	0.06
SIDEL BUS DUCT-1 30 FUSE	0.48	18	17.94	Category 0	In Box	17.94	0.41
SIDEL BUS DUCT-1 400 FUSE	0.48	18	18.62	Category 0	In Box	7.08	1.1
SIDEL BUS DUCT-1 60	0.48	18	4.52	Category 0	In Box	4.52	0.12
SIDEL BUS DUCT-1 60 FUSE	0.48	18	18.33	Category 0	In Box	18.33	0.41
SIDEL BUS DUCT-2 100	0.48	18	7.19	Category 0	In Box	7.19	0.19
SIDEL BUS DUCT-2 100 FUSE	0.48	18	29.52	Category 0	In Box	29.52	0.57
SIDEL BUS DUCT-2 200	0.48	18	15.51	Category 0	In Box	15.51	0.40
SIDEL BUS DUCT-2 200 FUSE	0.48	18	29.82	Category 0	In Box	29.82	0.58
SIDEL BUS DUCT-2 30	0.48	18	2.24	Category 0	In Box	2.24	0.06
SIDEL BUS DUCT-2 30 FUSE	0.48	18	28.43	Category 0	In Box	28.43	0.54
SIDEL BUS DUCT-2 400	0.48	18	18.86	Category 0	In Box	7.17	1.1
SIDEL BUS DUCT-2 400 FUSE	0.48	18	29.89	Category 0	In Box	29.89	0.58
SIDEL BUS DUCT-2 60	0.48	18	4.88	Category 0	In Box	4.88	0.13
SIDEL BUS DUCT-2 60 FUSE	0.48	18	29.29	Category 0	In Box	29.29	0.56
XFMR L-048 MAIN POWER PRI	0.48	24	26.99	Category 0	In Box	10.26	1.0
XFMR L-063 MAIN POWER PRI	0.48	24	17.77	Category 0	In Box	17.77	0.50

Table 6 – USS-2 PPE Requirements

MDP-1

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
MDP-1	0.48	18	50.51	N/A	In Box	14.47	373
MDP-1 3000 FUSE	0.48	18	50.54	N/A	In Box	14.49	374
XFMR-1 SEC	0.48	18	52.12	N/A	In Box	15.15	391
MCC-1	0.48	18	42.33	Category 2	In Box	12.1	6.2
CAPACITOR BANK-1	0.48	18	47.82	Category 1	In Box	47.82	1.6
CAPACITOR BANK-2	0.48	18	47.82	Category 1	In Box	47.82	1.6
CHILLER 1 & 2 800 FEED	0.48	18	50.27	Category 1	In Box	50.27	1.8
CHILLER-3 MDP-1 300 FEED	0.48	18	49.99	Category 1	In Box	49.99	1.8
CHILLER-4 MDP-1 450 FEED	0.48	18	50.01	Category 1	In Box	50.01	1.8
LIGHTING PANELS 1-2-3	0.48	18	45.54	Category 1	In Box	45.54	1.4

LIGHTING PNLS 1-2-3 800 FEED	0.48	18	50.31	Category 1	In Box	50.31	1.8
MCC-1 1200 FEED	0.48	18	50.43	Category 1	In Box	15.37	1.8
MCC-2 400 FEED	0.48	18	47.2	Category 1	In Box	44.74	1.5
P-1 MCC-1 MTR 150 FEED	0.48	18	41.62	Category 1	In Box	41.21	1.7
P-13 MCC-1 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-15 MCC-1 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-16 MCC-1 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-17 MCC-1 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-2 MCC-1 MTR 150 FEED	0.48	18	41.62	Category 1	In Box	41.21	1.7
P-25 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-26 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-27 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-28 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-29 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-3 MCC-1 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-30 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-31 MTR 15 FEED	0.48	18	37.7	Category 1	In Box	37.66	1.4
P-32 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-33 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-34 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-37 MTR 40 FEED	0.48	18	40.29	Category 1	In Box	40.19	1.6
P-38 MTR 40 FEED	0.48	18	40.29	Category 1	In Box	40.19	1.6
P-39 MTR 40 FEED	0.48	18	40.29	Category 1	In Box	40.19	1.6
P-40 MTR 40 FEED	0.48	18	40.29	Category 1	In Box	40.19	1.6
P-43 MTR 40 FEED	0.48	18	40.29	Category 1	In Box	40.19	1.6
P-44 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-45 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-46 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-47 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-48 MCC-1 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-49 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-5 MCC-1 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-50 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-51 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-52 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-57 MCC-1 MTR 50 FEED	0.48	18	40.29	Category 1	In Box	40.16	1.6
P-58 MTR 100 FEED	0.48	18	41.37	Category 1	In Box	41.09	1.7
P-59 MTR 100 FEED	0.48	18	41.37	Category 1	In Box	41.09	1.7
P-6 MCC-1 MTR 150 FEED	0.48	18	41.71	Category 1	In Box	41.19	1.7
P-60 MTR 70 FEED	0.48	18	41.37	Category 1	In Box	41.16	1.7
P-61 MTR 70 FEED	0.48	18	41.36	Category 1	In Box	41.19	1.7
P-62 MTR 15 FEED	0.48	18	37.7	Category 1	In Box	37.66	1.4
P-7 MTR 50 FEED	0.48	18	40.29	Category 1	In Box	40.16	1.6

P-8 MCC-1 MTR 25 FEED	0.48	18	39.41	Category 1	In Box	39.34	1.5
P-9 MCC-1 MTR 15 FEED	0.48	18	37.7	Category 1	In Box	37.66	1.4
S. PUMP RM BUS DUCT 1000 FEED	0.48	18	50.39	Category 1	In Box	47.93	1.8
S. PUMP RM BUS DUCT S	0.48	18	47.58	Category 1	In Box	45.12	1.6
S. PUMP RM BUS DUCT S 100 FUSE	0.48	18	46.47	Category 1	In Box	46.47	1.5
S. PUMP RM BUS DUCT S 200 FUSE	0.48	18	47.02	Category 1	In Box	47.02	1.5
S. PUMP RM BUS DUCT S 30 FUSE	0.48	18	44.21	Category 1	In Box	44.21	1.3
S. PUMP RM BUS DUCT S 400 FUSE	0.48	18	47.16	Category 1	In Box	47.16	1.5
S. PUMP RM BUS DUCT S 60 FUSE	0.48	18	46.02	Category 1	In Box	46.02	1.4
S. PUMP RM BUS DUCT S 600	0.48	18	31.63	Category 1	In Box	12.02	1.9
S. PUMP RM BUS DUCT S 600 FUSE	0.48	18	47.35	Category 1	In Box	47.35	1.5
TOWER FAN-1 150 FEED	0.48	18	41.62	Category 1	In Box	41.27	1.7
TOWER FAN-2 150 FEED	0.48	18	41.62	Category 1	In Box	41.27	1.7
CHILLER 1 & 2	0.48	18	37.09	Category 0	In Box	37.09	0.87
CHILLER-3 MDP-1	0.48	18	32.24	Category 0	In Box	32.24	0.66
CHILLER-4 MDP-1	0.48	18	32.9	Category 0	In Box	32.9	0.69
MCC-2	0.48	18	35.84	Category 0	In Box	33.36	0.81
P-1 MCC-1	0.48	18	11.18	Category 0	In Box	10.93	0.43
P-13 MCC-1	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-15 MCC-1	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-16 MCC-1	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-17 MCC-1	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-18 MCC-2	0.48	18	2.28	Category 0	In Box	2.26	0.09
P-18 MCC-2 MTR 25 FEED	0.48	18	33.64	Category 0	In Box	33.58	1.1
P-2 MCC-1	0.48	18	11.18	Category 0	In Box	10.93	0.43
P-23	0.48	18	10.72	Category 0	In Box	10.51	0.42
P-23 MTR 150 FEED	0.48	18	35.31	Category 0	In Box	34.97	1.2
P-24	0.48	18	12.53	Category 0	In Box	12.18	0.49
P-24 MTR 150 FEED	0.48	18	35.38	Category 0	In Box	34.86	1.2
P-25	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-26	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-27	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-28	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-29	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-3 MCC-1	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-30	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-31	0.48	18	1.46	Category 0	In Box	1.45	0.06
P-32	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-33	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-34	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-35	0.48	18	3.27	Category 0	In Box	3.24	0.13
P-35 MTR 40 FEED	0.48	18	34.3	Category 0	In Box	34.2	1.1

P-36	0.48	18	3.27	Category 0	In Box	3.24	0.13
P-36 MTR 40 FEED	0.48	18	34.3	Category 0	In Box	34.2	1.1
P-37	0.48	18	3.3	Category 0	In Box	3.27	0.13
P-38	0.48	18	3.3	Category 0	In Box	3.27	0.13
P-39	0.48	18	3.3	Category 0	In Box	3.27	0.13
P-40	0.48	18	3.3	Category 0	In Box	3.27	0.13
P-41	0.48	18	3.27	Category 0	In Box	3.24	0.13
P-41 MTR 40 FEED	0.48	18	34.3	Category 0	In Box	34.2	1.1
P-42	0.48	18	3.27	Category 0	In Box	3.24	0.13
P-42 MTR 40 FEED	0.48	18	34.3	Category 0	In Box	34.2	1.1
P-43	0.48	18	3.3	Category 0	In Box	3.27	0.13
P-44	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-45	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-46	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-47	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-48 MCC-1	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-48 MCC-2	0.48	18	3.27	Category 0	In Box	3.24	0.13
P-48 MCC-2 MTR 40 FEED	0.48	18	34.3	Category 0	In Box	34.2	1.1
P-49	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-5 MCC-1	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-50	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-51	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-52	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-53	0.48	18	7.55	Category 0	In Box	7.41	0.29
P-53 MTR 100 FEED	0.48	18	35.12	Category 0	In Box	34.84	1.2
P-54	0.48	18	7.55	Category 0	In Box	7.41	0.29
P-54 MTR 100 FEED	0.48	18	35.12	Category 0	In Box	34.84	1.2
P-55	0.48	18	7.55	Category 0	In Box	7.41	0.29
P-55 MTR 100 FEED	0.48	18	35.12	Category 0	In Box	34.84	1.2
P-57 MCC-1	0.48	18	3.31	Category 0	In Box	3.27	0.13
P-58	0.48	18	7.73	Category 0	In Box	7.6	0.30
P-59	0.48	18	7.73	Category 0	In Box	7.6	0.30
P-6 MCC-1	0.48	18	13.14	Category 0	In Box	12.79	0.51
P-60	0.48	18	7.69	Category 0	In Box	7.6	0.30
P-61	0.48	18	7.68	Category 0	In Box	7.6	0.30
P-62	0.48	18	1.46	Category 0	In Box	1.45	0.06
P-63	0.48	18	7.51	Category 0	In Box	7.41	0.29
P-63 MTR 70 FEED	0.48	18	35.11	Category 0	In Box	34.91	1.2
P-7	0.48	18	3.31	Category 0	In Box	3.27	0.13
P-8 MCC-1	0.48	18	2.29	Category 0	In Box	2.27	0.09
P-9 MCC-1	0.48	18	1.46	Category 0	In Box	1.45	0.06
S. PUMP RM BUS DUCT S 100	0.48	18	7.74	Category 0	In Box	7.74	0.20
S. PUMP RM BUS DUCT S 200	0.48	18	19.23	Category 0	In Box	19.23	0.41
S. PUMP RM BUS DUCT S 30	0.48	18	2.28	Category 0	In Box	2.28	0.06
S. PUMP RM BUS DUCT S 400	0.48	18	24.7	Category 0	In Box	9.38	0.54
S. PUMP RM BUS DUCT S 60	0.48	18	5.11	Category 0	In Box	5.11	0.13

TOWER FAN-1	0.48	18	11.14	Category 0	In Box	10.94	0.43
TOWER FAN-2	0.48	18	11.14	Category 0	In Box	10.94	0.43

Table 7 – MDP-1 PPE Requirements

MDP-2

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
MDP-2	0.48	18	38.55	N/A	In Box	14.65	373
MDP-2 3000 FUSE	0.48	18	38.59	N/A	In Box	14.66	373
XFMR-2 SEC	0.48	18	40.38	N/A	In Box	15.34	390
BELLISS-4	0.48	18	21.02	Category 2	In Box	7.99	5.0
DRYER MEZZ BUS DUCT 400 FUSE1	0.48	18	20.34	Category 2	In Box	7.73	7.7
DRYER MEZZ BUS DUCT 600	0.48	18	22.47	Category 2	In Box	8.54	4.2
80 TON CHILLER PANELBOARD	0.48	18	34.89	Category 1	In Box	13.26	1.5
BELLISS-1	0.48	18	25.07	Category 1	In Box	9.53	2.2
BELLISS-2	0.48	18	22.16	Category 1	In Box	8.42	3.9
BELLISS-3	0.48	18	23.44	Category 1	In Box	8.91	1.3
DRYER MEZZ BUS DUCT	0.48	18	29.64	Category 1	In Box	11.26	2.2
DRYER MEZZ BUS DUCT 600 FUSE	0.48	18	29.55	Category 1	In Box	11.23	2.2
DRYER MEZZ CAP BANK	0.48	18	15.23	Category 1	In Box	5.79	1.9
MINI GEM BUS DUCT-2	0.48	18	34.95	Category 1	In Box	13.28	3.5
MINI GEM BUS DUCT-2 1200 FEED	0.48	18	38.48	Category 1	In Box	14.62	2.3
MINI GEM BUS DUCT-2 600	0.48	18	25.49	Category 1	In Box	9.69	3.1
MINI GEM BUS DUCT-2 600 FUSE	0.48	18	34.82	Category 1	In Box	13.23	1.5
80 TON CHILLER PNLBD 600 FEED	0.48	18	38.4	Category 0	In Box	14.59	1.2
BELLISS-1 800 FEED	0.48	18	38.45	Category 0	In Box	38.45	0.94
BELLISS-2 800 FEED	0.48	18	38.41	Category 0	In Box	38.41	0.94
BELLISS-3 600 FEED	0.48	18	38.4	Category 0	In Box	38.4	0.94
BELLISS-4 800 FEED	0.48	18	38.4	Category 0	In Box	38.4	0.94
DRYER MEZZ BUS DUCT 100	0.48	18	7.22	Category 0	In Box	7.22	0.19
DRYER MEZZ BUS DUCT 100 FUSE	0.48	18	29.14	Category 0	In Box	29.14	0.56
DRYER MEZZ BUS DUCT 200	0.48	18	15.5	Category 0	In Box	15.5	0.40
DRYER MEZZ BUS DUCT 200 FUSE	0.48	18	29.41	Category 0	In Box	29.41	0.57
DRYER MEZZ BUS DUCT 30	0.48	18	2.25	Category 0	In Box	2.25	0.06
DRYER MEZZ BUS DUCT 30 FUSE	0.48	18	28.15	Category 0	In Box	28.15	0.53
DRYER MEZZ BUS DUCT 400	0.48	18	18.73	Category 0	In Box	7.12	1.1
DRYER MEZZ BUS DUCT 400 FUSE	0.48	18	29.47	Category 0	In Box	29.47	0.57
DRYER MEZZ BUS DUCT 60	0.48	18	4.9	Category 0	In Box	4.9	0.13

DRYER MEZZ BUS DUCT 60 FUSE	0.48	18	28.93	Category 0	In Box	28.93	0.55
DRYER MEZZ BUS DUCT 600 FEED	0.48	18	38.4	Category 0	In Box	14.59	1.2
MINI GEM BUS DUCT-2 100	0.48	18	7.46	Category 0	In Box	7.46	0.19
MINI GEM BUS DUCT-2 100 FUSE	0.48	18	34.32	Category 0	In Box	34.32	0.74
MINI GEM BUS DUCT-2 200	0.48	18	16.91	Category 0	In Box	16.91	0.41
MINI GEM BUS DUCT-2 200 FUSE	0.48	18	34.64	Category 0	In Box	34.64	0.76
MINI GEM BUS DUCT-2 30	0.48	18	2.27	Category 0	In Box	2.27	0.06
MINI GEM BUS DUCT-2 30 FUSE	0.48	18	33.08	Category 0	In Box	33.08	0.69
MINI GEM BUS DUCT-2 400	0.48	18	20.79	Category 0	In Box	7.9	0.84
MINI GEM BUS DUCT-2 400 FUSE	0.48	18	34.72	Category 0	In Box	34.72	0.76
MINI GEM BUS DUCT-2 60	0.48	18	5	Category 0	In Box	5	0.13
MINI GEM BUS DUCT-2 60 FUSE	0.48	18	34.06	Category 0	In Box	34.06	0.73

Table 8 – MDP-2 PPE Requirements

MDP-3

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
MDP-3	0.48	18	38.3	N/A	In Box	14.55	371
MDP-3 3000 FUSE	0.48	18	38.33	N/A	In Box	14.57	371
XFMR-3 SEC	0.48	18	40.1	N/A	In Box	15.24	388
BELLISS-5	0.48	18	20.94	Category 3	In Box	7.96	15
BELLISS-6	0.48	18	19.92	Category 3	In Box	7.57	17
HUSKY BUS DUCT-4	0.48	18	34.73	Category 3	In Box	13.2	17
HUSKY BUS DUCT-4 1200 FEED	0.48	18	38.22	Category 3	In Box	14.52	12
HUSKY BUS DUCT-4 600	0.48	18	25.36	Category 1	In Box	9.64	3.2
HUSKY BUS DUCT-4 600 FUSE	0.48	18	34.6	Category 1	In Box	13.15	1.5
HUSKY BUS DUCT-5	0.48	18	34.73	Category 1	In Box	13.2	3.9
HUSKY BUS DUCT-5 1200 FEED	0.48	18	38.22	Category 1	In Box	14.52	2.0
HUSKY BUS DUCT-5 600	0.48	18	25.36	Category 1	In Box	9.64	3.2
HUSKY BUS DUCT-5 600 FUSE	0.48	18	34.6	Category 1	In Box	13.15	1.5
BELLISS-5 800 FEED	0.48	18	38.16	Category 0	In Box	38.16	0.93
BELLISS-6 800 FEED	0.48	18	38.16	Category 0	In Box	38.16	0.93
CAPACITOR BANKS 5 & 6	0.48	18	36.19	Category 0	In Box	36.19	0.83
CAPACITOR BANKS 5 & 6 800 FEED	0.48	18	38.13	Category 0	In Box	38.13	0.93
HUSKY BUS DUCT-4 100	0.48	18	7.45	Category 0	In Box	7.45	0.19
HUSKY BUS DUCT-4 100 FUSE	0.48	18	34.1	Category 0	In Box	34.1	0.73

HUSKY BUS DUCT-4 200	0.48	18	16.85	Category 0	In Box	16.85	0.41
HUSKY BUS DUCT-4 200 FUSE	0.48	18	34.42	Category 0	In Box	34.42	0.75
HUSKY BUS DUCT-4 30	0.48	18	2.27	Category 0	In Box	2.27	0.06
HUSKY BUS DUCT-4 30 FUSE	0.48	18	32.87	Category 0	In Box	32.87	0.68
HUSKY BUS DUCT-4 400	0.48	18	20.7	Category 0	In Box	7.87	0.85
HUSKY BUS DUCT-4 400 FUSE	0.48	18	34.5	Category 0	In Box	34.5	0.75
HUSKY BUS DUCT-4 60	0.48	18	5	Category 0	In Box	5	0.13
HUSKY BUS DUCT-4 60 FUSE	0.48	18	33.85	Category 0	In Box	33.85	0.72
HUSKY BUS DUCT-5 100	0.48	18	7.45	Category 0	In Box	7.45	0.19
HUSKY BUS DUCT-5 100 FUSE	0.48	18	34.1	Category 0	In Box	34.1	0.73
HUSKY BUS DUCT-5 200	0.48	18	16.85	Category 0	In Box	16.85	0.41
HUSKY BUS DUCT-5 200 FUSE	0.48	18	34.42	Category 0	In Box	34.42	0.75
HUSKY BUS DUCT-5 30	0.48	18	2.27	Category 0	In Box	2.27	0.06
HUSKY BUS DUCT-5 30 FUSE	0.48	18	32.87	Category 0	In Box	32.87	0.68
HUSKY BUS DUCT-5 400	0.48	18	20.7	Category 0	In Box	7.87	0.85
HUSKY BUS DUCT-5 400 FUSE	0.48	18	34.5	Category 0	In Box	34.5	0.75
HUSKY BUS DUCT-5 60	0.48	18	5	Category 0	In Box	5	0.13
HUSKY BUS DUCT-5 60 FUSE	0.48	18	33.85	Category 0	In Box	33.85	0.72

Table 9 – MDP 3 PPE Requirements

USS-3

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
L-050 MAIN POWER	0.38	18	6.82	N/A	In Box	2.59	67
L-051 MAIN POWER	0.38	18	11.14	N/A	In Box	4.23	109
L-052 MAIN POWER	0.38	18	7.87	N/A	In Box	2.99	77
L-053 MAIN POWER	0.38	18	12.17	N/A	In Box	4.62	119
USS-3	0.48	18	41.5	N/A	In Box	15.77	401
USS-3 3000 FUSE	0.48	18	41.53	N/A	In Box	15.78	401
XFMR L-050 MAIN POWER SEC	0.38	18	7.15	N/A	In Box	2.72	70
XFMR L-051 MAIN POWER SEC	0.38	18	11.34	N/A	In Box	4.31	111
XFMR L-052 MAIN POWER SEC	0.38	18	8.32	N/A	In Box	3.16	82
XFMR L-053 MAIN POWER SEC	0.38	18	12.49	N/A	In Box	4.75	122
XFMR USS-3 SEC	0.48	18	41.63	N/A	In Box	15.82	402
L-049 MAIN POWER	0.38	18	4.2	Category >4	In Box	1.6	41
XFMR L-049 MAIN POWER SEC	0.38	18	4.43	Category >4	In Box	1.68	44

XFMR L-051 MAIN POWER PRI	0.48	24	23.18	Category 4	In Box	8.81	33
HUSKY BUS DUCT-3	0.48	18	28.52	Category 3	In Box	10.84	9.0
L-051 MAIN POWER 1200 FEED	0.48	18	41.39	Category 3	In Box	15.73	9.2
POLY BUS DUCT-4	0.48	18	26.28	Category 3	In Box	9.99	19
XFMR L-053 MAIN POWER PRI	0.48	24	21.44	Category 3	In Box	8.15	14
HUSKY BUS DUCT-3 600	0.48	18	21.73	Category 2	In Box	8.26	5.0
POLY BUS DUCT-4 1000 FEED	0.48	18	41.39	Category 2	In Box	15.73	4.2
POLY BUS DUCT-4 600	0.48	18	20.42	Category 2	In Box	7.76	7.5
SIDEL BUS DUCT-3	0.48	18	32.1	Category 2	In Box	12.2	5.2
HUSKY BUS DUCT-3 1200 FEED	0.48	18	41.41	Category 1	In Box	15.74	1.6
HUSKY BUS DUCT-3 600 FUSE	0.48	18	28.44	Category 1	In Box	10.81	2.4
POLY BUS DUCT-4 400	0.48	18	17.28	Category 1	In Box	6.57	1.4
POLY BUS DUCT-4 600 FUSE	0.48	18	26.2	Category 1	In Box	9.96	2.9
SIDEL BUS DUCT-3 1200 FEED	0.48	18	41.39	Category 1	In Box	15.73	1.6
SIDEL BUS DUCT-3 600	0.48	18	23.82	Category 1	In Box	9.05	3.7
SIDEL BUS DUCT-3 600 FUSE	0.48	18	32	Category 1	In Box	12.16	1.8
HUSKY BUS DUCT-3 100	0.48	18	7.08	Category 0	In Box	7.08	0.18
HUSKY BUS DUCT-3 100 FUSE	0.48	18	28	Category 0	In Box	28	0.53
HUSKY BUS DUCT-3 200	0.48	18	15.02	Category 0	In Box	15.02	0.39
HUSKY BUS DUCT-3 200 FUSE	0.48	18	28.3	Category 0	In Box	28.3	0.53
HUSKY BUS DUCT-3 30	0.48	18	2.23	Category 0	In Box	2.23	0.06
HUSKY BUS DUCT-3 30 FUSE	0.48	18	26.95	Category 0	In Box	26.95	0.50
HUSKY BUS DUCT-3 400	0.48	18	18.21	Category 0	In Box	6.92	1.2
HUSKY BUS DUCT-3 400 FUSE	0.48	18	28.36	Category 0	In Box	28.36	0.54
HUSKY BUS DUCT-3 60	0.48	18	4.83	Category 0	In Box	4.83	0.13
HUSKY BUS DUCT-3 60 FUSE	0.48	18	27.78	Category 0	In Box	27.78	0.52
L-049 MAIN POWER 400 FEED	0.48	18	31.98	Category 0	In Box	31.98	0.65
L-050 MAIN POWER 400 FEED	0.48	18	31.98	Category 0	In Box	31.98	0.65
L-052 MAIN POWER 400 FEED	0.48	18	31.98	Category 0	In Box	31.98	0.65
L-053 MAIN POWER 1000 FEED	0.48	18	41.39	Category 0	In Box	41.39	1.1
POLY BUS DUCT-4 100	0.48	18	6.99	Category 0	In Box	6.99	0.18
POLY BUS DUCT-4 100 FUSE	0.48	18	25.84	Category 0	In Box	25.84	0.48
POLY BUS DUCT-4 200	0.48	18	14.42	Category 0	In Box	14.42	0.37
POLY BUS DUCT-4 200 FUSE	0.48	18	26.09	Category 0	In Box	26.09	0.48
POLY BUS DUCT-4 30	0.48	18	2.23	Category 0	In Box	2.23	0.06
POLY BUS DUCT-4 30 FUSE	0.48	18	24.97	Category 0	In Box	24.97	0.46

POLY BUS DUCT-4 400 FUSE	0.48	18	26.14	Category 0	In Box	26.14	0.48
POLY BUS DUCT-4 60	0.48	18	4.8	Category 0	In Box	4.8	0.12
POLY BUS DUCT-4 60 FUSE	0.48	18	25.66	Category 0	In Box	25.66	0.47
SIDEL BUS DUCT-3 100	0.48	18	7.28	Category 0	In Box	7.28	0.19
SIDEL BUS DUCT-3 100 FUSE	0.48	18	31.5	Category 0	In Box	31.5	0.63
SIDEL BUS DUCT-3 200	0.48	18	16.04	Category 0	In Box	16.04	0.41
SIDEL BUS DUCT-3 200 FUSE	0.48	18	31.83	Category 0	In Box	31.83	0.64
SIDEL BUS DUCT-3 30	0.48	18	2.25	Category 0	In Box	2.25	0.06
SIDEL BUS DUCT-3 30 FUSE	0.48	18	30.27	Category 0	In Box	30.27	0.59
SIDEL BUS DUCT-3 400	0.48	18	19.65	Category 0	In Box	7.47	0.98
SIDEL BUS DUCT-3 400 FUSE	0.48	18	31.91	Category 0	In Box	31.91	0.65
SIDEL BUS DUCT-3 60	0.48	18	4.92	Category 0	In Box	4.92	0.13
SIDEL BUS DUCT-3 60 FUSE	0.48	18	31.24	Category 0	In Box	31.24	0.62
XFMR L-049 MAIN POWER PRI	0.48	24	28.45	Category 0	In Box	28.45	0.35
XFMR L-050 MAIN POWER PRI	0.48	24	28.45	Category 0	In Box	28.45	0.35
XFMR L-052 MAIN POWER PRI	0.48	24	28.56	Category 0	In Box	28.56	0.35

Table 10– USS-3 PPE Requirements

USS-4

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
L-060 MAIN POWER	0.38	18	8.86	N/A	In Box	3.37	87
L-065 MAIN POWER	0.38	18	10.8	N/A	In Box	4.11	106
USS-4	0.48	18	52.71	N/A	In Box	20.03	407
USS-4 5000 FUSE	0.48	18	52.75	N/A	In Box	20.05	407
W. WHSE SWBD	0.48	18	24.18	N/A	In Box	9.19	236
XFMR L-060 MAIN POWER PRI	0.48	24	13.78	N/A	In Box	5.24	88
XFMR L-060 MAIN POWER SEC	0.38	18	9.04	N/A	In Box	3.44	89
XFMR L-065 MAIN POWER SEC	0.38	18	11.18	N/A	In Box	4.25	110
XFMR USS-4 SEC	0.48	18	52.84	N/A	In Box	20.08	407
L-064 MAIN POWER	0.38	18	5.18	Category >4	In Box	1.97	51
XFMR L-064 MAIN POWER SEC	0.38	18	5.5	Category >4	In Box	2.09	54
L-060 2000 SWBD	0.48	18	51.62	Category 3	In Box	19.62	8.8
W. WHSE SWBD 2000 FEED	0.48	18	52.55	Category 3	In Box	19.97	8.0
W. WHSE SWBD 600	0.48	18	19.11	Category 3	In Box	7.26	11
L-060 2000 SWBD 2000 FEED	0.48	18	52.61	Category 2	In Box	19.99	8.0
L-065 MAIN POWER 800 FEED	0.48	18	51.46	Category 2	In Box	51.46	4.5

L-060 2000 SWBD 100 FUSE	0.48	18	50.46	Category 1	In Box	50.46	1.8
L-060 2000 SWBD 200 FUSE	0.48	18	51	Category 1	In Box	51	1.8
L-060 2000 SWBD 30 FUSE	0.48	18	48.1	Category 1	In Box	48.1	1.6
L-060 2000 SWBD 400 FUSE	0.48	18	51.14	Category 1	In Box	51.14	1.8
L-060 2000 SWBD 60 FUSE	0.48	18	50.01	Category 1	In Box	50.01	1.8
L-060 2000 SWBD 600	0.48	18	33.55	Category 1	In Box	12.75	1.6
L-060 2000 SWBD 600 FUSE	0.48	18	51.36	Category 1	In Box	51.36	1.8
L-060 MAIN POWER 1200 FEED	0.48	18	52.55	Category 1	In Box	52.55	1.8
L-064 MAIN POWER 400 FEED	0.48	18	44.56	Category 1	In Box	44.56	2.5
USS-4 1200 SWBD	0.48	18	44.69	Category 1	In Box	44.69	1.3
USS-4 1200 SWBD 100 FUSE	0.48	18	43.68	Category 1	In Box	43.68	1.3
USS-4 1200 SWBD 1000 FEED	0.48	18	52.53	Category 1	In Box	52.53	1.8
USS-4 1200 SWBD 200 FUSE	0.48	18	44.19	Category 1	In Box	44.19	1.3
USS-4 1200 SWBD 400 FUSE	0.48	18	44.31	Category 1	In Box	44.31	1.3
USS-4 1200 SWBD 60 FUSE	0.48	18	43.27	Category 1	In Box	43.27	1.2
USS-4 1200 SWBD 600	0.48	18	30.29	Category 1	In Box	11.51	2.1
USS-4 1200 SWBD 600 FUSE	0.48	18	44.48	Category 1	In Box	44.48	1.3
W. WHSE SWBD 400	0.48	18	16.33	Category 1	In Box	6.21	1.6
W. WHSE SWBD 600 FUSE	0.48	18	24.11	Category 1	In Box	9.16	3.6
L-060 2000 SWBD 100	0.48	18	7.85	Category 0	In Box	7.85	0.20
L-060 2000 SWBD 200	0.48	18	19.99	Category 0	In Box	19.99	0.41
L-060 2000 SWBD 30	0.48	18	2.29	Category 0	In Box	2.29	0.06
L-060 2000 SWBD 400	0.48	18	25.86	Category 0	In Box	25.86	0.48
L-060 2000 SWBD 60	0.48	18	5.15	Category 0	In Box	5.15	0.13
USS-4 1200 SWBD 100	0.48	18	7.68	Category 0	In Box	7.68	0.20
USS-4 1200 SWBD 200	0.48	18	18.73	Category 0	In Box	18.73	0.41
USS-4 1200 SWBD 30	0.48	18	2.28	Category 0	In Box	2.28	0.06
USS-4 1200 SWBD 30 FUSE	0.48	18	41.63	Category 0	In Box	41.63	1.1
USS-4 1200 SWBD 400	0.48	18	23.87	Category 0	In Box	9.07	0.59
USS-4 1200 SWBD 60	0.48	18	5.08	Category 0	In Box	5.08	0.13
W. WHSE SWBD 100	0.48	18	6.85	Category 0	In Box	6.85	0.18
W. WHSE SWBD 100 FUSE	0.48	18	23.8	Category 0	In Box	23.8	0.44
W. WHSE SWBD 200	0.48	18	13.76	Category 0	In Box	13.76	0.36
W. WHSE SWBD 200 FUSE	0.48	18	24.01	Category 0	In Box	24.01	0.45
W. WHSE SWBD 30	0.48	18	2.22	Category 0	In Box	2.22	0.06
W. WHSE SWBD 30 FUSE	0.48	18	23.04	Category 0	In Box	23.04	0.43
W. WHSE SWBD 400 FUSE	0.48	18	24.06	Category 0	In Box	9.14	0.58
W. WHSE SWBD 60	0.48	18	4.74	Category 0	In Box	4.74	0.12
W. WHSE SWBD 60 FUSE	0.48	18	23.64	Category 0	In Box	23.64	0.44

XFMR L-064 MAIN POWER PRI	0.48	24	22.07	Category 0	In Box	22.07	0.57
XFMR L-065 MAIN POWER PRI	0.48	24	24.98	Category 0	In Box	24.98	0.75

Table 11 – USS-4 PPE Requirements

MDP-4

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
L-055 MAIN POWER	0.38	18	12.29	N/A	In Box	4.67	119
MDP-4	0.48	18	52.97	N/A	In Box	18.81	405
MDP-4 5000 FUSE	0.48	18	53	N/A	In Box	18.83	405
XFMR L-055 MAIN POWER SEC	0.38	18	12.31	N/A	In Box	4.68	119
XFMR-4 SEC	0.48	18	54.93	N/A	In Box	19.57	406
MCC-3	0.48	18	27	Category 3	In Box	8.9	20
BELLISS-7 800 FEED	0.48	18	50.69	Category 2	In Box	50.69	4.4
BELLISS-8 800 FEED	0.48	18	50.66	Category 2	In Box	50.66	4.4
MDP-4 2000 SWBD FEED	0.48	18	52.86	Category 2	In Box	20.09	5.9
MDP-4 2000A SWBD	0.48	18	50.92	Category 2	In Box	19.35	7.2
SIDEL BUS #15 600	0.48	18	22.53	Category 2	In Box	8.56	4.2
S. PUMP RM BUS DUCT N	0.48	18	26.94	Category 2	In Box	10.24	7.1
S. PUMP RM BUS DUCT N 600	0.48	18	20.72	Category 2	In Box	7.87	6.7
BELLISS-7	0.48	18	30.59	Category 1	In Box	30.59	1.5
BELLISS-8	0.48	18	30.99	Category 1	In Box	30.99	1.5
BOX MEZZ 600 FEED	0.48	18	45.31	Category 1	In Box	45.31	1.4
CAPACITOR BANK-7 400 FEED	0.48	18	45.05	Category 1	In Box	45.05	1.4
HUSKY REGRIND 200 FEED	0.48	18	44.96	Category 1	In Box	44.96	1.4
L-055 MAIN POWER 1000 FEED	0.48	18	50.76	Category 1	In Box	19.29	2.0
MCC-3 DRYER MEZZ 1200 FEED	0.48	18	52.85	Category 1	In Box	49.39	1.9
MDP-4 1200 SWBD	0.48	18	45.52	Category 1	In Box	45.52	1.4
MDP-4 1200 SWBD FEED	0.48	18	52.79	Category 1	In Box	52.79	1.9
MDP-4 2000A SWBD 1000 BKR	0.48	18	50.75	Category 1	In Box	19.29	2.0
QUINCY 1 600 FEED	0.48	18	50.64	Category 1	In Box	50.64	1.8
QUINCY 2 600 FEED	0.48	18	50.64	Category 1	In Box	50.64	1.8
S PUMP RM BUS DUCT N 1000 FEED	0.48	18	52.82	Category 1	In Box	52.82	1.9
S. PUMP RM BUS DUCT N 400	0.48	18	17.5	Category 1	In Box	6.65	1.3
S. PUMP RM BUS DUCT N 600 FUSE	0.48	18	26.86	Category 1	In Box	10.21	2.8
SIDEL #14 200 FEED	0.48	18	45.01	Category 1	In Box	45.01	1.4
SIDEL BUS #15	0.48	18	29.9	Category 1	In Box	29.9	2.9
SIDEL BUS #15 600 FUSE	0.48	18	29.8	Category 1	In Box	11.33	2.2
XFMR L-055 MAIN	0.48	24	23.64	Category 1	In Box	23.64	1.4

POWER PRI							
BOX MEZZ	0.48	18	22.77	Category 0	In Box	8.65	0.56
CAPACITOR BANK-7	0.48	18	26.69	Category 0	In Box	26.69	0.50
HUSKY REGRIND	0.48	18	8.98	Category 0	In Box	8.98	0.39
P-13 MCC-3	0.48	18	9.9	Category 0	In Box	9.57	0.38
P-13 MCC-3 MTR 150 FEED	0.48	18	26.67	Category 0	In Box	26.17	0.74
P-15 MCC-3	0.48	18	9.9	Category 0	In Box	9.57	0.38
P-15 MCC-3 MTR 150 FEED	0.48	18	26.67	Category 0	In Box	26.17	0.74
P-22	0.48	18	2.27	Category 0	In Box	2.23	0.09
P-22 MTR 100 FEED	0.48	18	25.56	Category 0	In Box	25.43	0.71
P-3 MCC-3	0.48	18	9.81	Category 0	In Box	9.54	0.38
P-3 MCC-3 MTR 150 FEED	0.48	18	26.54	Category 0	In Box	26.14	0.74
P-5 MCC-3	0.48	18	9.81	Category 0	In Box	9.54	0.38
P-5 MCC-3 MTR 150 FEED	0.48	18	26.54	Category 0	In Box	26.14	0.74
P-57 MCC-3	0.48	18	2.27	Category 0	In Box	2.23	0.09
P-57 MCC-3 MTR 100 FEED	0.48	18	25.56	Category 0	In Box	25.43	0.71
P-6 MCC-3	0.48	18	9.81	Category 0	In Box	9.54	0.38
P-6 MCC-3 MTR 150 FEED	0.48	18	26.54	Category 0	In Box	26.14	0.74
P-A	0.48	18	3.23	Category 0	In Box	3.16	0.13
P-A MTR 100 FEED	0.48	18	25.99	Category 0	In Box	25.79	0.72
P-B	0.48	18	3.23	Category 0	In Box	3.16	0.13
P-B MTR 100 FEED	0.48	18	25.99	Category 0	In Box	25.79	0.72
P-C	0.48	18	3.23	Category 0	In Box	3.16	0.13
P-C MTR 100 FEED	0.48	18	25.99	Category 0	In Box	25.79	0.72
QUINCY 1	0.48	18	16.64	Category 0	In Box	16.64	1.0
QUINCY 2	0.48	18	16.64	Category 0	In Box	16.64	1.0
S. PUMP RM BUS DUCT N 100	0.48	18	6.89	Category 0	In Box	6.89	0.18
S. PUMP RM BUS DUCT N 100 FUSE	0.48	18	26.41	Category 0	In Box	26.41	0.49
S. PUMP RM BUS DUCT N 200	0.48	18	14.38	Category 0	In Box	14.38	0.37
S. PUMP RM BUS DUCT N 200 FUSE	0.48	18	26.72	Category 0	In Box	26.72	0.50
S. PUMP RM BUS DUCT N 30	0.48	18	2.22	Category 0	In Box	2.22	0.06
S. PUMP RM BUS DUCT N 30 FUSE	0.48	18	25.32	Category 0	In Box	25.32	0.47
S. PUMP RM BUS DUCT N 400 FUSE	0.48	18	26.79	Category 0	In Box	26.79	0.50
S. PUMP RM BUS DUCT N 60	0.48	18	4.74	Category 0	In Box	4.74	0.12
S. PUMP RM BUS DUCT N 60 FUSE	0.48	18	26.17	Category 0	In Box	26.17	0.48
SIDEL #14	0.48	18	8.17	Category 0	In Box	8.17	0.35
SIDEL BUS #15 100	0.48	18	7.14	Category 0	In Box	7.14	0.18
SIDEL BUS #15 100 FUSE	0.48	18	29.33	Category 0	In Box	29.33	0.56
SIDEL BUS #15 200	0.48	18	15.38	Category 0	In Box	15.38	0.40
SIDEL BUS #15 200 FUSE	0.48	18	29.65	Category 0	In Box	29.65	0.57
SIDEL BUS #15 30	0.48	18	2.24	Category 0	In Box	2.24	0.06

SIDEL BUS #15 30 FUSE	0.48	18	28.18	Category 0	In Box	28.18	0.53
SIDEL BUS #15 400	0.48	18	18.76	Category 0	In Box	7.13	1.1
SIDEL BUS #15 400 FUSE	0.48	18	29.73	Category 0	In Box	29.73	0.57
SIDEL BUS #15 60	0.48	18	4.86	Category 0	In Box	4.86	0.13
SIDEL BUS #15 60 FUSE	0.48	18	29.09	Category 0	In Box	29.09	0.56
TOWER FAN-4	0.48	18	9.9	Category 0	In Box	9.57	0.38
TOWER FAN-4 150 FEED	0.48	18	26.67	Category 0	In Box	26.17	0.74

Table 12 – MDP-4 PPE Requirements

MDP-5

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
L-058 MAIN POWER	0.38	18	7.62	N/A	In Box	2.9	75
L-059 MAIN POWER	0.38	18	7.25	N/A	In Box	2.76	71
MDP-5	0.48	18	50.98	N/A	In Box	19.37	405
MDP-5 5000 FUSE	0.48	18	51.02	N/A	In Box	19.39	405
XFMR L-058 MAIN POWER SEC	0.38	18	10.32	N/A	In Box	3.92	101
XFMR L-059 MAIN POWER SEC	0.38	18	10.32	N/A	In Box	3.92	101
XFMR-5 SEC	0.48	18	53.04	N/A	In Box	20.15	407
L-054 MAIN POWER	0.38	18	6.03	Category >4	In Box	2.29	59
L-056 MAIN POWER	0.38	18	5.49	Category >4	In Box	2.09	54
L-057 MAIN POWER	0.38	18	6.3	Category >4	In Box	2.39	62
XFMR L-054 MAIN POWER SEC	0.38	18	6.17	Category >4	In Box	2.35	61
XFMR L-056 MAIN POWER SEC	0.38	18	5.57	Category >4	In Box	2.12	55
XFMR L-057 MAIN POWER SEC	0.38	18	6.44	Category >4	In Box	2.45	63
1200A DRY MEZZ SWBD	0.48	18	34.3	Category 2	In Box	13.03	4.1
HUSKY BUS DUCT-6	0.48	18	29.64	Category 2	In Box	11.26	7.6
HUSKY BUS DUCT-6 600	0.48	18	22.37	Category 2	In Box	8.5	4.3
1200A DRY MEZZ SWBD 1200 FEED	0.48	18	50.86	Category 1	In Box	50.86	1.8
1200A DRY MEZZ SWBD 600	0.48	18	24.93	Category 1	In Box	9.47	3.3
1200A DRY MEZZ SWBD 600 FUSE	0.48	18	34.17	Category 1	In Box	12.98	1.6
2000A DRY MEZZ SWBD	0.48	18	40.18	Category 1	In Box	15.27	1.4
2000A DRY MEZZ SWBD 1200 FEED	0.48	18	50.86	Category 1	In Box	50.86	1.8
2000A DRY MEZZ SWBD 600	0.48	18	28.13	Category 1	In Box	10.69	2.5
HUSKY BUS DUCT-6 1200 FEED	0.48	18	50.84	Category 1	In Box	50.84	1.8
HUSKY BUS DUCT-6 600 FUSE	0.48	18	29.54	Category 1	In Box	11.23	2.2
L-058 MAIN POWER 900 FEED	0.48	18	34.21	Category 1	In Box	34.21	3.7

L-059 MAIN POWER 900 FEED	0.48	18	34.21	Category 1	In Box	34.21	3.7
SIDEL 1200 MEZZ PNL	0.48	18	37.54	Category 1	In Box	14.27	2.5
SIDEL 1200 MEZZ PNL 1200 FEED	0.48	18	50.84	Category 1	In Box	50.84	1.8
SIDEL 1200 MEZZ PNL 600	0.48	18	26.66	Category 1	In Box	10.13	2.8
SIDEL 1200 MEZZ PNL 600 FUSE	0.48	18	37.39	Category 1	In Box	14.21	1.3
XFMR L-058 MAIN POWER PRI	0.48	24	17.64	Category 1	In Box	17.64	1.3
XFMR L-059 MAIN POWER PRI	0.48	24	17.64	Category 1	In Box	17.64	1.3
1200A DRY MEZZ SWBD 100	0.48	18	7.29	Category 0	In Box	7.29	0.19
1200A DRY MEZZ SWBD 100 FUSE	0.48	18	33.55	Category 0	In Box	33.55	0.71
1200A DRY MEZZ SWBD 200	0.48	18	16.4	Category 0	In Box	16.4	0.41
1200A DRY MEZZ SWBD 200 FUSE	0.48	18	33.97	Category 0	In Box	33.97	0.73
1200A DRY MEZZ SWBD 30	0.48	18	2.25	Category 0	In Box	2.25	0.06
1200A DRY MEZZ SWBD 30 FUSE	0.48	18	32.02	Category 0	In Box	32.02	0.65
1200A DRY MEZZ SWBD 400	0.48	18	20.4	Category 0	In Box	7.75	0.89
1200A DRY MEZZ SWBD 400 FUSE	0.48	18	34.07	Category 0	In Box	34.07	0.73
1200A DRY MEZZ SWBD 60	0.48	18	4.92	Category 0	In Box	4.92	0.13
1200A DRY MEZZ SWBD 60 FUSE	0.48	18	33.22	Category 0	In Box	33.22	0.70
2000A DRY MEZZ SWBD 100	0.48	18	7.58	Category 0	In Box	7.58	0.20
2000A DRY MEZZ SWBD 100 FUSE	0.48	18	39.34	Category 0	In Box	39.34	0.99
2000A DRY MEZZ SWBD 200	0.48	18	17.92	Category 0	In Box	17.92	0.41
2000A DRY MEZZ SWBD 200 FUSE	0.48	18	39.77	Category 0	In Box	39.77	1.0
2000A DRY MEZZ SWBD 30	0.48	18	2.27	Category 0	In Box	2.27	0.06
2000A DRY MEZZ SWBD 30 FUSE	0.48	18	37.65	Category 0	In Box	37.65	0.90
2000A DRY MEZZ SWBD 400	0.48	18	22.5	Category 0	In Box	8.55	0.69
2000A DRY MEZZ SWBD 400 FUSE	0.48	18	39.87	Category 0	In Box	39.87	1.0
2000A DRY MEZZ SWBD 60	0.48	18	5.04	Category 0	In Box	5.04	0.13
2000A DRY MEZZ SWBD 60 FUSE	0.48	18	38.99	Category 0	In Box	38.99	0.97
2000A DRY MEZZ SWBD 600 FUSE	0.48	18	40.01	Category 0	In Box	15.2	1.1
HUSKY BUS DUCT-6 100	0.48	18	7.12	Category 0	In Box	7.12	0.18
HUSKY BUS DUCT-6 100 FUSE	0.48	18	29.07	Category 0	In Box	29.07	0.56
HUSKY BUS DUCT-6 200	0.48	18	15.3	Category 0	In Box	15.3	0.40
HUSKY BUS DUCT-6 200 FUSE	0.48	18	29.39	Category 0	In Box	29.39	0.56
HUSKY BUS DUCT-6 30	0.48	18	2.24	Category 0	In Box	2.24	0.06
HUSKY BUS DUCT-6 30 FUSE	0.48	18	27.93	Category 0	In Box	27.93	0.52

HUSKY BUS DUCT-6 400	0.48	18	18.65	Category 0	In Box	7.09	1.1
HUSKY BUS DUCT-6 400 FUSE	0.48	18	29.47	Category 0	In Box	29.47	0.57
HUSKY BUS DUCT-6 60	0.48	18	4.85	Category 0	In Box	4.85	0.13
HUSKY BUS DUCT-6 60 FUSE	0.48	18	28.83	Category 0	In Box	28.83	0.55
L-054 MAIN POWER 400 FEED	0.48	18	37.35	Category 0	In Box	37.35	0.89
L-056 MAIN POWER 400 FEED	0.48	18	37.37	Category 0	In Box	37.37	0.89
L-057 MAIN POWER 400 FEED	0.48	18	37.37	Category 0	In Box	37.37	0.89
SIDEL 1200 MEZZ PNL 100	0.48	18	7.43	Category 0	In Box	7.43	0.19
SIDEL 1200 MEZZ PNL 100 FUSE	0.48	18	36.7	Category 0	In Box	36.7	0.85
SIDEL 1200 MEZZ PNL 200	0.48	18	17.17	Category 0	In Box	17.17	0.41
SIDEL 1200 MEZZ PNL 200 FUSE	0.48	18	37.16	Category 0	In Box	37.16	0.88
SIDEL 1200 MEZZ PNL 30	0.48	18	2.26	Category 0	In Box	2.26	0.06
SIDEL 1200 MEZZ PNL 30 FUSE	0.48	18	34.98	Category 0	In Box	34.98	0.77
SIDEL 1200 MEZZ PNL 400	0.48	18	21.54	Category 0	In Box	8.19	0.77
SIDEL 1200 MEZZ PNL 400 FUSE	0.48	18	37.27	Category 0	In Box	37.27	0.88
SIDEL 1200 MEZZ PNL 60	0.48	18	4.98	Category 0	In Box	4.98	0.13
SIDEL 1200 MEZZ PNL 60 FUSE	0.48	18	36.33	Category 0	In Box	36.33	0.84
XFMR L-054 MAIN POWER PRI	0.48	24	21.46	Category 0	In Box	21.46	0.46
XFMR L-056 MAIN POWER PRI	0.48	24	13.99	Category 0	In Box	13.99	0.40
XFMR L-057 MAIN POWER PRI	0.48	24	13.32	Category 0	In Box	13.32	0.38

Table 13 – MDP-5 PPE Requirements

USS-5

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
USS-5	0.48	18	59.76	N/A	In Box	20.1	408
USS-5 6000 FUSE	0.48	18	59.8	N/A	In Box	20.11	408
XFMR USS-5 SEC	0.48	18	59.89	N/A	In Box	20.15	408
USS-5 2000 SWBD-1 2000 BKR	0.48	18	53.73	Category 4	In Box	20.42	28
USS-5 2000 SWBD-2 2000 BKR	0.48	18	53.83	Category 4	In Box	20.26	29
BELLISS-10	0.48	18	36.86	Category 3	In Box	14.01	13
MCC-4	0.48	18	48.44	Category 3	In Box	15.94	8.8
USS-5 2000 SWBD-1 FEED	0.48	18	59.63	Category 3	In Box	22.66	18
USS-5 2000 SWBD-2 FEED	0.48	18	59.63	Category 3	In Box	22.46	19
BELLISS-11 800 FEED	0.48	18	53.36	Category 2	In Box	53.36	4.7

USS-5 2000 SWBD-1	0.48	18	53.62	Category 2	In Box	53.62	7.5
USS-5 2000 SWBD-2	0.48	18	53.72	Category 2	In Box	53.2	7.5
ATLAS COPCO COMP 600 FEED	0.48	18	53.43	Category 1	In Box	53.43	1.9
BELLISS-10 2000 FEED	0.48	18	59.59	Category 1	In Box	59.59	2.1
BELLISS-11	0.48	18	35.39	Category 1	In Box	35.39	2.0
CHILLER-5 400 FEED	0.48	18	53.19	Category 1	In Box	53.19	1.9
CHILLER-6 500 FEED	0.48	18	53.41	Category 1	In Box	53.41	1.9
CHILLER-7 600 FEED	0.48	18	53.32	Category 1	In Box	53.32	1.9
HAMWORTHY-2 300 FEED	0.48	18	53.15	Category 1	In Box	53.15	1.9
MCC-4 1200 FEED	0.48	18	59.59	Category 1	In Box	20.23	2.8
P-1 MCC-4 MTR 250 FEED	0.48	18	47.93	Category 1	In Box	46.9	1.6
P-10 150 FEED	0.48	18	46.73	Category 1	In Box	46.45	2.2
P-11 150 FEED	0.48	18	46.73	Category 1	In Box	46.45	2.2
P-12 150 FEED	0.48	18	46.73	Category 1	In Box	46.45	2.2
P-13 MCC-4 MTR 150 FEED	0.48	18	47.55	Category 1	In Box	47.03	2.3
P-14 150 FEED	0.48	18	47.55	Category 1	In Box	47.03	2.3
P-15 MCC-4 MTR 150 FEED	0.48	18	47.55	Category 1	In Box	47.03	2.3
P-17 MCC-4 150 FEED	0.48	18	47.23	Category 1	In Box	46.89	2.3
P-18 MCC-4 150 FEED	0.48	18	47.23	Category 1	In Box	46.89	2.3
P-19 150 FEED	0.48	18	47.23	Category 1	In Box	46.89	2.3
P-2 MCC-4 MTR 250 FEED	0.48	18	47.93	Category 1	In Box	46.9	1.6
P-3 MCC-4 MTR 250 FEED	0.48	18	47.93	Category 1	In Box	46.9	1.6
PUMP ROOM PNL 225 FEED	0.48	18	53.09	Category 1	In Box	53.09	1.9
USS-5 2000 SWBD-1 250 BKR	0.48	18	53.01	Category 1	In Box	53.01	1.9
USS-5 2000 SWBD-1 30 BKR	0.48	18	49.47	Category 1	In Box	49.47	2.9
USS-5 2000 SWBD-1 60 BKR	0.48	18	51.72	Category 1	In Box	51.72	3.1
USS-5 2000 SWBD-1 90 BKR	0.48	18	52.6	Category 1	In Box	52.6	3.1
USS-5 2000 SWBD-2 100 BKR	0.48	18	52.7	Category 1	In Box	52.7	3.1
USS-5 2000 SWBD-2 300 BKR	0.48	18	53.15	Category 1	In Box	53.15	1.9
USS-5 2000 SWBD-2 350 BKR	0.48	18	53.19	Category 1	In Box	53.19	1.9
USS-5 2000 SWBD-2 80 BKR	0.48	18	52.37	Category 1	In Box	52.37	3.1
USS-5 480 PANEL	0.48	18	42.55	Category 1	In Box	42.04	2.0
USS-5 480 PANEL 100 BKR	0.48	18	41.41	Category 1	In Box	41.41	1.9
USS-5 480 PANEL 15 BKR	0.48	18	37.12	Category 1	In Box	37.12	1.5
USS-5 480 PANEL 20 BKR1	0.48	18	37.12	Category 1	In Box	37.12	1.5
USS-5 480 PANEL 20 BKR10	0.48	18	37.12	Category 1	In Box	37.12	1.5
USS-5 480 PANEL 20 BKR2	0.48	18	37.12	Category 1	In Box	37.12	1.5
USS-5 480 PANEL 20 BKR3	0.48	18	37.12	Category 1	In Box	37.12	1.5
USS-5 480 PANEL 20	0.48	18	37.12	Category 1	In Box	37.12	1.5

BKR4							
USS-5 480 PANEL 20 BKR5	0.48	18	37.12	Category 1	In Box	37.12	1.5
USS-5 480 PANEL 20 BKR6	0.48	18	37.12	Category 1	In Box	37.12	1.5
USS-5 480 PANEL 20 BKR7	0.48	18	37.12	Category 1	In Box	37.12	1.5
USS-5 480 PANEL 20 BKR8	0.48	18	37.12	Category 1	In Box	37.12	1.5
USS-5 480 PANEL 20 BKR9	0.48	18	37.12	Category 1	In Box	37.12	1.5
USS-5 480 PANEL 225 BKR	0.48	18	53.1	Category 1	In Box	52.58	1.9
USS-5 480 PANEL 25 BKR	0.48	18	39.06	Category 1	In Box	39.06	1.7
USS-5 480 PANEL 30 BKR1	0.48	18	39.06	Category 1	In Box	39.06	1.7
USS-5 480 PANEL 30 BKR2	0.48	18	39.06	Category 1	In Box	39.06	1.7
USS-5 480 PANEL 70 BKR1	0.48	18	41.42	Category 1	In Box	41.25	1.9
USS-5 480 PANEL 70 BKR2	0.48	18	41.42	Category 1	In Box	41.25	1.9
USS-5 480 PANEL 70 BKR3	0.48	18	41.42	Category 1	In Box	41.25	1.9
USS-5 480 PNLBRD 225 FEED	0.48	18	53.09	Category 1	In Box	53.09	1.9
WORTHINGTON 400 FEED	0.48	18	53.19	Category 1	In Box	53.19	1.9
25 HP CENTER TOWER FAN	0.48	18	7.58	Category 0	In Box	7.5	0.33
25 HP NORTH TOWER FAN	0.48	18	7.58	Category 0	In Box	7.5	0.33
25 HP SOUTH TOWER FAN	0.48	18	7.58	Category 0	In Box	7.5	0.33
ATLAS COPCO COMP	0.48	18	34.28	Category 0	In Box	13.03	0.84
BELLISS PLC CNTRL	0.208	18	0.54	Category 0	In Box	0.54	0.65
BOTTLE VIBRATION TABLE	0.208	18	0.54	Category 0	In Box	0.54	0.65
CHEMICAL PUMP 1	0.208	18	0.54	Category 0	In Box	0.54	0.65
CHEMICAL PUMP 2	0.208	18	0.54	Category 0	In Box	0.54	0.65
CHILLER-5	0.48	18	26.28	Category 0	In Box	26.28	0.49
CHILLER-6	0.48	18	32.76	Category 0	In Box	12.45	0.81
CHILLER-7	0.48	18	33.51	Category 0	In Box	33.51	0.71
COOLING TWR RECP	0.208	18	0.54	Category 0	In Box	0.54	0.65
H-126 HEATER	0.208	18	0.54	Category 0	In Box	0.54	0.65
HAMWORTHY-2	0.48	18	24.92	Category 0	In Box	24.92	0.46
HUSKY MAINT SHOP LGHTS	0.48	18	1.44	Category 0	In Box	0.55	0.20
L-059 DEHUMIDIFIER	0.48	18	2.26	Category 0	In Box	2.26	0.10
L-125 CNVYR MTR	0.208	18	0.54	Category 0	In Box	0.54	0.65
LGTS SIDEL MOLD SHOP	0.208	18	0.54	Category 0	In Box	0.54	0.65
MAKE-UP AIR FAN	0.208	18	0.54	Category 0	In Box	0.54	0.65
MIXER #7 POWER	0.208	18	0.54	Category 0	In Box	0.54	0.65
P-1 MCC-4	0.48	18	21.75	Category 0	In Box	20.84	0.42
P-10	0.48	18	5.19	Category 0	In Box	5.09	0.20
P-11	0.48	18	5.19	Category 0	In Box	5.09	0.20
P-12	0.48	18	5.19	Category 0	In Box	5.09	0.20
P-13 MCC-4	0.48	18	11.53	Category 0	In Box	11.22	0.45

P-14	0.48	18	11.53	Category 0	In Box	11.22	0.45
P-15 MCC-4	0.48	18	11.53	Category 0	In Box	11.22	0.45
P-17 MCC-4	0.48	18	7.87	Category 0	In Box	7.72	0.31
P-18 MCC-4	0.48	18	7.87	Category 0	In Box	7.72	0.31
P-19	0.48	18	7.87	Category 0	In Box	7.72	0.31
P-2 MCC-4	0.48	18	21.75	Category 0	In Box	20.84	0.42
P-3 MCC-4	0.48	18	21.75	Category 0	In Box	20.84	0.42
PLC PWR PUMP RM	0.208	18	0.54	Category 0	In Box	0.54	0.65
PUMP RM EX FAN 1	0.48	18	1.44	Category 0	In Box	0.55	0.20
PUMP RM EX FAN 2	0.48	18	1.44	Category 0	In Box	0.55	0.20
PUMP RM HIGH BAY LGHTS 1	0.48	18	1.44	Category 0	In Box	0.55	0.20
PUMP RM HIGH BAY LGHTS 2	0.48	18	1.44	Category 0	In Box	0.55	0.20
PUMP RM LOW BAY LGHTS 1	0.48	18	1.44	Category 0	In Box	0.55	0.20
PUMP RM LOW BAY LGHTS 2	0.48	18	1.44	Category 0	In Box	0.55	0.20
PUMP RM OUTSIDE LGHTS	0.48	18	1.44	Category 0	In Box	0.55	0.20
PUMP ROOM PNL	0.48	18	22.08	Category 0	In Box	22.08	0.70
PUMP ROOM RECP 1	0.208	18	0.54	Category 0	In Box	0.54	0.65
PUMP ROOM RECP 2	0.208	18	0.54	Category 0	In Box	0.54	0.65
PUMP ROOM RECP 3	0.208	18	0.54	Category 0	In Box	0.54	0.65
PUMP ROOM RECP 4	0.208	18	0.54	Category 0	In Box	0.54	0.65
PUMP ROOM RECP 5	0.208	18	0.54	Category 0	In Box	0.54	0.65
PUMP ROOM RECP 6	0.208	18	0.54	Category 0	In Box	0.54	0.65
RECP BELOW PANEL	0.208	18	0.54	Category 0	In Box	0.54	0.65
RECP SIDEL MOLD SHOP	0.208	18	0.54	Category 0	In Box	0.54	0.65
REGRIND HOPPER	0.48	18	1.44	Category 0	In Box	0.55	0.20
USS-5 208 50 BKR1	0.208	18	3	Category 0	In Box	3	0.13
USS-5 208 50 BKR2	0.208	18	3	Category 0	In Box	3	0.13
USS-5 208 50 BKR3	0.208	18	3	Category 0	In Box	3	0.13
USS-5 208 50 BKR4	0.208	18	3	Category 0	In Box	3	0.13
USS-5 208 50 BKR5	0.208	18	3	Category 0	In Box	3	0.13
USS-5 208 50 BKR6	0.208	18	3	Category 0	In Box	3	0.13
USS-5 208 PANEL	0.208	18	3.06	Category 0	In Box	3.06	1.2
USS-5 208 PNL 20 BKR1	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR10	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR11	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR12	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR13	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR14	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR15	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR16	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR17	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR18	0.208	18	2.94	Category 0	In Box	2.94	0.13

USS-5 208 PNL 20 BKR19	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR2	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR20	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR21	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR3	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR4	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR5	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR6	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR7	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR8	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 208 PNL 20 BKR9	0.208	18	2.94	Category 0	In Box	2.94	0.13
USS-5 480 PNLBRD	0.48	18	42.37	Category 0	In Box	42.37	1.2
USS-5 SPARE	0.48	18	26.28	Category 0	In Box	26.28	0.49
WELDER RECP BELOW PNL	0.208	18	1.01	Category 0	In Box	0.39	1.2
WELDER RECP PUMP RM 1	0.208	18	1.01	Category 0	In Box	0.39	1.2
WELDER RECP PUMP RM 2	0.208	18	1.01	Category 0	In Box	0.39	1.2
WELDER RECP PUMP RM 3	0.208	18	1.01	Category 0	In Box	0.39	1.2
WELDER RECP PUMP RM 4	0.208	18	1.01	Category 0	In Box	0.39	1.2
WORTHINGTON	0.48	18	26.28	Category 0	In Box	26.28	0.49
XFMR USS-5 208 PNL PRI	0.48	18	7.51	Category 0	In Box	7.51	0.33
XFMR USS-5 208 PNL SEC	0.208	18	3.12	Category 0	In Box	3.12	1.2

Table 14 – USS-5 PPE Requirements

USS-6

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
LINE 202	0.48	18	30.3	N/A	In Box	11.52	102
LINE 203 & 204	0.48	18	28.3	N/A	In Box	10.76	142
USS-6	0.48	18	46.93	N/A	In Box	17.83	406
USS-6 5000 FUSE	0.48	18	46.94	N/A	In Box	17.84	406
XFMR L-062 MAIN POWER SEC	0.38	18	7.54	N/A	In Box	2.86	74
XFMR USS-6 SEC	0.48	18	47.01	N/A	In Box	17.86	406
L-042 MAIN POWER	0.38	18	4.19	Category >4	In Box	1.59	41
L-062 MAIN POWER	0.38	18	6.19	Category >4	In Box	2.35	61
XFMR L-042 MAIN POWER SEC	0.38	18	4.4	Category >4	In Box	1.67	43
LINE 201	0.48	18	32.05	Category 3	In Box	12.18	25
LINE 202 2000 FEED	0.48	18	46.73	Category 3	In Box	17.76	11

LINE 203 & 204 2000 FEED	0.48	18	46.73	Category 3	In Box	17.76	11
LINE 201 1600 FEED	0.48	18	46.72	Category 2	In Box	17.75	4.0
USS-6 250 FUSE	12.47	36	7.35	Category 2	In Box	7.35	6.7
USS-6 SWBD 1600 FEED	0.48	18	46.85	Category 1	In Box	17.8	4.0
L-042 MAIN POWER 225 FEED	0.48	18	41.06	Category 0	In Box	41.06	1.1
L-062 MAIN POWER 400 FEED	0.48	18	41.28	Category 0	In Box	41.28	1.1
XFMR L-042 MAIN POWER PRI	0.48	24	22.43	Category 0	In Box	22.43	0.28
XFMR L-062 MAIN POWER PRI	0.48	24	21.5	Category 0	In Box	21.5	0.46

Table 15 – USS-6 PPE Requirements

USS-7

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
USS-7	0.48	18	49.14	N/A	In Box	17.57	407
USS-7 5000 FUSE	0.48	18	49.17	N/A	In Box	17.59	407
XFMR USS-7 SEC	0.48	18	49.24	N/A	In Box	17.61	407
MCC-5	0.48	18	32.75	Category 4	In Box	11.35	35
USS-7 SWBD-1	0.48	18	42.83	Category 3	In Box	16.27	18
USS-7 SWBD-1 2000 FEED	0.48	18	48.62	Category 3	In Box	18.48	9.2
USS-7 SWBD-2	0.48	18	43.14	Category 3	In Box	16.39	18
USS-7 SWBD-2 2000 FEED	0.48	18	49.01	Category 3	In Box	18.62	8.8
BELLISS-13	0.48	18	41.39	Category 2	In Box	15.73	7.7
MCC-5 1600 FEED	0.48	18	48.91	Category 2	In Box	17.49	4.4
BELLISS-13 1600 FEED	0.48	18	49.02	Category 1	In Box	18.63	3.1
CT-8 MCC-5	0.48	18	10.44	Category 0	In Box	10.12	0.41
CT-8 MCC-5 MTR 150 FEED	0.48	18	32.26	Category 0	In Box	31.76	0.99
P-16 MCC-5	0.48	18	10.44	Category 0	In Box	10.12	0.41
P-16 MCC-5 MTR 150 FEED	0.48	18	32.26	Category 0	In Box	31.76	0.99
P-4 MCC-5	0.48	18	17.88	Category 0	In Box	16.96	0.42
P-4 MCC-5 MTR 250 FEED	0.48	18	32.5	Category 0	In Box	31.5	0.67
P-20 MCC-5	0.48	18	7.39	Category 0	In Box	7.22	0.29
P-20 MCC-5 150 FEED	0.48	18	32.07	Category 0	In Box	31.73	0.98
P-8 MCC-5	0.48	18	5	Category 0	In Box	4.89	0.19
P-8 MCC-5 150 FEED	0.48	18	31.77	Category 0	In Box	31.5	0.96
P-9 MCC-5	0.48	18	5	Category 0	In Box	4.89	0.19
P-9 MCC-5 150 FEED	0.48	18	31.77	Category 0	In Box	31.5	0.96

Table 16 – USS-7 PPE Requirements

USS-8

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm ²)
NISSEI BUS	0.48	18	36.59	N/A	In Box	13.9	357
NISSEI BUS 3000 FEED	0.48	18	42.99	N/A	In Box	16.34	348
USS-8	0.48	18	43.04	N/A	In Box	16.35	413
USS-8 6000 FUSE	0.48	18	43.06	N/A	In Box	43.06	878
XFMR USS-8 SEC	0.48	18	43.12	N/A	In Box	43.12	875
USS-8 2000 FUSE	0.48	18	42.93	Category 3	In Box	16.31	19
CHILLER PUMP MCC	0.48	18	38.79	Category 1	In Box	14.74	2.2
CHILLER PUMP MCC 1200 FEED	0.48	18	42.93	Category 1	In Box	16.31	1.3
NISSEI BUS 600	0.48	18	26.3	Category 1	In Box	9.99	2.9
NISSEI BUS 600 FUSE	0.48	18	36.45	Category 1	In Box	13.85	1.3
L-082 MAIN POWER	0.48	18	26.91	Category 0	In Box	26.91	0.50
L-082 MAIN POWER 250 FEED	0.48	18	36.34	Category 0	In Box	36.34	0.84
L-082 PIOVAN DRYER	0.48	18	13.08	Category 0	In Box	13.08	0.34
L-082 PIOVAN DRYER 100 FEED	0.48	18	35.87	Category 0	In Box	35.87	0.81
L-082 PIOVAN LDR PMP 30 FEED	0.48	18	34.43	Category 0	In Box	34.43	0.75
L-082 PIOVAN LOADER PUMP	0.48	18	4.38	Category 0	In Box	4.38	0.11
L-082 THERMOLATOR	0.48	18	9.23	Category 0	In Box	9.23	0.24
L-082 THERMOLATOR 60 FEED	0.48	18	35.57	Category 0	In Box	35.57	0.80
L-083 MAIN POWER	0.48	18	26.91	Category 0	In Box	26.91	0.50
L-083 MAIN POWER 250 FEED	0.48	18	36.34	Category 0	In Box	36.34	0.84
L-083 PIOVAN DRYER	0.48	18	13.08	Category 0	In Box	13.08	0.34
L-083 PIOVAN DRYER 100 FEED	0.48	18	35.87	Category 0	In Box	35.87	0.81
L-083 PIOVAN LDR PMP 30 FEED	0.48	18	34.43	Category 0	In Box	34.43	0.75
L-083 PIOVAN LOADER PUMP	0.48	18	4.38	Category 0	In Box	4.38	0.11
L-083 THERMOLATOR	0.48	18	9.23	Category 0	In Box	9.23	0.24
L-083 THERMOLATOR 60 FEED	0.48	18	35.57	Category 0	In Box	35.57	0.80
L-084 MAIN POWER	0.48	18	26.91	Category 0	In Box	26.91	0.50
L-084 MAIN POWER 250 FEED	0.48	18	36.34	Category 0	In Box	36.34	0.84
L-084 PIOVAN DRYER	0.48	18	13.08	Category 0	In Box	13.08	0.34
L-084 PIOVAN DRYER 100 FEED	0.48	18	35.87	Category 0	In Box	35.87	0.81
L-084 PIOVAN LDR PMP 30 FEED	0.48	18	34.43	Category 0	In Box	34.43	0.75
L-084 PIOVAN LOADER PUMP	0.48	18	4.38	Category 0	In Box	4.38	0.11
L-084 THERMOLATOR	0.48	18	9.23	Category 0	In Box	9.23	0.24
L-084 THERMOLATOR 60 FEED	0.48	18	35.57	Category 0	In Box	35.57	0.80
L-085 MAIN POWER	0.48	18	26.91	Category 0	In Box	26.91	0.50
L-085 MAIN POWER 250 FEED	0.48	18	36.34	Category 0	In Box	36.34	0.84
L-085 PIOVAN DRYER	0.48	18	13.08	Category 0	In Box	13.08	0.34

L-085 PIOVAN DRYER 100 FEED	0.48	18	35.87	Category 0	In Box	35.87	0.81
L-085 PIOVAN LDR PMP 30 FEED	0.48	18	34.43	Category 0	In Box	34.43	0.75
L-085 PIOVAN LOADER PUMP	0.48	18	4.38	Category 0	In Box	4.38	0.11
L-085 THERMOLATOR	0.48	18	9.23	Category 0	In Box	9.23	0.24
L-085 THERMOLATOR 60 FEED	0.48	18	35.57	Category 0	In Box	35.57	0.80
L-086 MAIN POWER	0.48	18	26.91	Category 0	In Box	26.91	0.50
L-086 MAIN POWER 250 FEED	0.48	18	36.34	Category 0	In Box	36.34	0.84
L-086 PIOVAN DRYER	0.48	18	13.08	Category 0	In Box	13.08	0.34
L-086 PIOVAN DRYER 100 FEED	0.48	18	35.87	Category 0	In Box	35.87	0.81
L-086 PIOVAN LDR PMP 30 FEED	0.48	18	34.43	Category 0	In Box	34.43	0.75
L-086 PIOVAN LOADER PUMP	0.48	18	4.38	Category 0	In Box	4.38	0.11
L-086 THERMOLATOR	0.48	18	9.23	Category 0	In Box	9.23	0.24
L-086 THERMOLATOR 60 FEED	0.48	18	35.57	Category 0	In Box	35.57	0.80
NISSEI BUS 200	0.48	18	17.17	Category 0	In Box	17.17	0.41
NISSEI BUS 200 FUSE	0.48	18	36.25	Category 0	In Box	36.25	0.83
NISSEI DEHUMIDIFIER	0.48	18	4.38	Category 0	In Box	4.38	0.11
NISSEI DEHUMIDIFIER 30 FEED	0.48	18	34.43	Category 0	In Box	34.43	0.75

Table 17 – USS-8 PPE Requirements

USS-9

Bus Name/ID	Bus Voltage (kV)	Working Distance (in)	3-Phase Bolted Phase Short Circuit (kA)	Calculated Hazard Risk Category, PPE Level	Configuration	3-Phase Arc (kA)	3-Phase Energy (cal/cm^2)
USS-9	4.16	18	4.43	N/A	In Box	4.43	71
CHILLER-1 USS-9	4.16	18	4.39	Category 1	In Box	4.39	1.9
CHILLER-1 USS-9 150 FEED	4.16	18	4.43	Category 1	In Box	4.43	1.9
CHILLER-2 USS-9	4.16	18	4.37	Category 1	In Box	4.37	1.9
CHILLER-2 USS-9 150 FEED	4.16	18	4.43	Category 1	In Box	4.43	1.9
CHILLER-3 USS-9	4.16	18	4.35	Category 1	In Box	4.35	1.9
CHILLER-3 USS-9 150 FEED	4.16	18	4.43	Category 1	In Box	4.43	1.9
CHILLER-4 USS-9	4.16	18	4.32	Category 1	In Box	4.32	1.4
CHILLER-4 USS-9 125 FEED	4.16	18	4.43	Category 1	In Box	4.43	1.4

Table 18 – USS-9 PPE Requirements