Electrical Services & Systems
130 Commonwealth Drive
Warrendale, PA 15086
(724)779-5954

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SUBMITTED BY: J. ERIC CARPER

SHORT CIRCUIT STUDY
PROTECTIVE DEVICE COORDINATION STUDY
ARC FLASH HAZARD ANALYSIS
FOR
LOUIS A. JOHNSON
VA MEDICAL CENTER
CLARKSBURG, WV

REVISION 1
NOVEMBER 2012

1.0 EXECUTIVE SUMMARY

This report contains the results of analysis performed on the electrical distribution system for the Louis A. Johnson VA Medical Center, Clarksburg, WV. The purpose of this study is to evaluate new electrical equipment provided for this facility, as detailed below.

The executive summary contains the description and guide to the rest of the report. In addition, it also contains the recommendations of the entire study.

1.1 Objectives

1. Short-Circuit Study

Perform a short-circuit study on the new electrical distribution system shown in order to determine the available fault current at pertinent locations throughout the distribution system. The scope of the study includes:

- Analysis begins at the incoming 12.47 kV utility service, continues through the medium and low voltage substations, and ends at the low voltage panelboards provided by Eaton and shown in contract drawings EP4-103 to EP4-106.

The available fault currents determined by the short-circuit study will be used in the coordination and device evaluation analysis.

2. Equipment Evaluation

Evaluate the short-circuit ratings of new protective devices and other distribution equipment supplied by Eaton under this contract. Evaluate the withstand ratings of ATS CC, ATS EQ, and ATS LS.

3. Coordination Study

Develop time-current coordination plots to derive coordinated settings for new protective devices.

4. Arc Flash Analysis

Perform an arc flash hazard analysis per NFPA 70E on the electrical distribution system described in item #1 above.

5. Recommendations

Provide specific recommendations for improving the electrical distribution system performance and correcting any deficiencies found by the studies.

1.2 Results

1. Short-Circuit Study

Short-circuit currents were calculated for each bus shown on the one-line diagrams in Appendix C.

The following upstream available fault current information was provided from the Power System Analysis Study by Schneider Electric of Square D on July 16, 2010 at the primary of the utility transformers:

- Voltage: 12.47 kV
- Three-phase fault current: 5,733 A, X/R= 5.122
- Single-line to ground fault current: 725 A, X/R=5.122

The system was modeled for worst-case fault currents. In order to model worst-case fault currents, the main and tie breakers at Switchgear LVA were configured as follows:

- BKR LVA-A - OPEN
- BKR LVA-B - CLOSED
- BKR TIE LVA - CLOSED

The main and tie breakers at Switchgear LVA are key-interlocked such that only 2 of the 3 breakers can be closed at any time.

See Section 2, Appendix A and Appendix B for more information.

2. Equipment Evaluation

The Equipment Evaluation is based on the power system worst-case short-circuit current configuration.

The short-circuit ratings of protective devices and other distribution equipment are evaluated in Section 2, Table 2.1.

In summary of Table 2.1, no equipment failed the equipment evaluation.

Equipment evaluation status is listed as "UNKNOWN", and a "MINIMUM REQUIRED" short-circuit rating is suggested at locations representing sites for future distribution equipment or at locations for which distribution equipment information and/or short-circuit rating information is not available.

The short-circuit withstand ratings of low voltage disconnect switches are not evaluated in this study. Care should be taken in order to ensure that these devices are applied within their UL listed short-circuit withstand ratings. The typical withstand ratings for Cutler-Hammer disconnect switches (safety switches) range from 10,000 A to 200,000 A for certain fused types.

3. Coordination Study

The time-current coordination plots of the protective overcurrent devices are shown in Section 3. In developing the device settings, consideration was given to both isolation of faults and protection of cables and transformers.

Efforts were made to provide the best coordination possible with the combination of new and existing devices.

The normal system coordination began at the 12.47 kV transformer fuses and continued downstream through Switchgear LVA to the largest feeder breaker at each panelboard. The emergency system coordination began at the generator breaker and continued downstream through Switchboard SWGR Parallel to the largest feeder breaker at each panelboard.

See Section 3 for more information and Section 4 for device settings.

4. Suggested Protective Device Settings

Settings for the protective devices are shown in Section 4.

Each entry references a coordination plot number found in Section 3. The referenced plot illustrates the coordination of the listed device with the relevant “upstream” and “downstream” protective devices. The protective devices listed in Section 4 should be set per the suggested settings.

5. Arc Flash Analysis

Details of the arc flash analysis are shown in Section 5. This arc flash hazard analysis of the Louis A. Johnson VA Medical Center, in Clarksburg, WV required energy and boundary calculations for approximately one-hundred fifty-seven (157) locations. In summary of Section 5, there are several locations that have incident energy levels that are above 40 cal/cm^2. An incident energy greater than 40 cal/cm^2 will be described in this study as “DANGER” and no Hazard/ Risk Category can be applied. Thus, no PPE is approved to protect the worker from a potential arc flash hazard and the equipment enclosure should not be opened unless the equipment is de-energized, tagged-out, and locked-out. The remaining locations have acceptable hazard levels.

See Table 5.2, Table 5.3, and Table 5.4 for a complete arc flash summary. **Note that the incident energy values listed in Table 5.2 and Table 5.3 are**

only valid after the recommended protective device settings shown in Section 4 have been implemented.

1.3 Recommendations

1. Recommended Settings

Adjustable protective device settings should be set according to the settings tables provided in Section 4.

It is recommended that ground fault protection not be used on the load side of the automatic transfer switches, per NEC 2008 Article 517.17. These locations include busses EQSWBD, CCSWBD, and BHEQA. However, coordinated ground fault settings are provided in the settings table within this report.

2. Reducing Incident Energy Levels

The calculated incident energy at a particular location is dependent on three main factors: short-circuit current, distance, and time. These three factors directly affect the incident energy in the following manner:

Short-circuit current: The short-circuit current for a given power system is dependent on the system impedance and source fault current and cannot be easily reduced.

Distance: IEEE Std 1584™-2002 provides a table with typical working distances. Increasing the working distance reduces the amount of incident energy that reaches the worker; however it becomes difficult to perform many work tasks with an increased working distance and therefore this is not an optimal solution for most cases.

Time: The incident energy decreases when reducing the exposure time of the arc. This exposure time is directly related to the clearing time of the protective device(s) which feed the fault location.

Based on the preceding summary, arc flash mitigation techniques are most effective and feasible when they involve reducing the arc exposure time. In many locations, the setting of the protective device can be adjusted in order to decrease the interrupting time, resulting in a decreased incident energy. However, in this study, settings for protective devices have not been adjusted to reduce incident energy if the chance of nuisance trips within critical circuits is introduced.

The other option involving reducing the arc exposure time is to consider equipment modifications and upgrades. Several solutions include upgrading trip units, installing “maintenance switches”, and using relays with multiple

settings groups. Each specific location needs to be analyzed to determine which reduction method is best employed.

3. Testing and Preventative Maintenance

It is recommended that regularly scheduled testing and preventative maintenance be performed to ensure that the electrical distribution equipment continues to perform at an optimum level. Testing should entail secondary injection testing of all power circuit breakers to verify proper tripping ranges, contact resistance testing, insulation resistance testing and complete switchgear and transformer cleaning and inspection.

4. Periodic Arc Flash Analysis Review

The 2009 edition of the NFPA 70E includes several new requirements regarding arc flash hazard analysis. One new requirement is found in Article 130.3 and requires that an arc flash hazard analysis shall be updated when a major modification or renovation of an electrical system takes place. Furthermore, the NFPA 70E-2009 requires that the arc flash hazard analysis be reviewed periodically, not to exceed five years. It is recommended that a plan is implemented to schedule a review of the arc flash hazard analysis for Louis A. Johnson VA Medical Center, Clarksburg, WV in a period not to exceed five years and that a review is performed whenever substantial modifications or renovations take place.

5. Predictive Diagnostics Using Continuous Partial Discharge Measurements

Eaton recommends conducting Continuous Partial Discharge measurements on most medium voltage power transformers, bus ducts, switchgear, motors, generators, terminations and splices of transmission and distribution cables. Partial Discharge (PD) analysis is a non-invasive, online method of collecting, filtering and evaluating PD occurring in electrical apparatus. The goals are:

- To detect partial discharges as a result failing or compromised insulation

- To analyze the partial discharge activity and, if an insulation defect is detected,

  a. Make conclusions as to the severity of the defect.
  b. Advise as to possible defect locations and possible cause(s) of the defect.
  c. Advise as to urgency of inspection.
  d. Suggest preventive measures both immediate and long term.

Electrical insulation is very important to monitor as it defines a major item in the reliability of electrical machines. Continuous Partial Discharge on-line monitoring using the Eaton InsulGard™ is the most sensitive and reliable method for detecting failing insulation. PD monitoring when used in

conjunction with Eaton's RM™ system offers customers the added benefit of prompt expert analysis and recommendation.

2.0 SHORT-CIRCUIT ANALYSIS

The short-circuit study determines the fault currents that flow in the system during various fault conditions. The calculated fault currents are used in the device evaluation and coordination studies. See Appendix A and Appendix B for the computer generated input data and output data.

The short-circuit calculations were done using A_FAULT, a computer software package by SKM Systems Analysis. The short-circuit analysis performed by A_FAULT is based on IEEE Std C37.010™-1999, IEEE Std C37.5™-1979, and IEEE Std C37.13™-2008.

Separate “Z” (complex), “X” (reactive), and "R" (resistive) networks are used by A_FAULT for the short-circuit analysis. A_FAULT uses complex network reduction and the relationship E/Z to calculate the fault current magnitude and angle at each faulted bus. The complex equivalent circuit impedance, Z, is calculated by the reduction of the “Z” (complex) network, and is reported as the “EQUIV. IMPEDANCE” in the A_FAULT reports. The X/R ratios calculated for each fault condition are based on the separate reduction of the X and R networks. These X/R ratios are used for the calculation of fault duty multipliers, to evaluate the short-circuit ratings of system components.

A_FAULT is capable of generating three types of short-circuit reports for both balanced (three-phase bolted) and unbalanced (line-to-ground) faults. The reports that are generated depend on the system that is being evaluated.

The three types of short-circuit reports are:

- Fault Report (for low voltage)
- Momentary Duty Report (for medium voltage)
- Interrupting Duty Report (for medium voltage)

1. Fault Report

The fault currents reported in the “Fault Report” are applicable to low voltage devices and components. The fault currents calculated in this report are based on the contribution data derived from IEEE Std C37.13-2008. The fault currents are calculated as follows:

- Motor and generator subtransient reactance values (Xd”) are adjusted per the first cycle duty multipliers described in IEEE Std 141™-1993 (Red Book).
- The complex equivalent circuit impedance, Z, is calculated by network reduction of the “Z” (complex) network.

- The momentary symmetrical current = E/Z.

- The X/R ratio is equal to the equivalent circuit reactance, X, divided by the equivalent circuit resistance, R. As discussed above, X is calculated by the reduction of the “X” (reactive) network and R is calculated by the reduction of the “R” (resistive) network.

Multiplying factors are determined and used to adjust the calculated symmetrical fault current. The adjusted current is used to evaluate low voltage protective devices. Low voltage output algorithms and output reports reflect NEMA AB-1 molded case breaker de-rating multipliers. Breakers are de-rated for circuits where the power factor is lower than the NEMA test circuit (higher X/R ratio). The multipliers adjust the symmetrical fault current to the value associated with the systems fault point X/R ratio. The adjusted value listed on the report may then be compared directly with the manufacturer's published interrupting rating.

2. Momentary Duty Report

The “Momentary Duty Report” contains the calculated fault currents that occur during the first half-cycle of the fault. The momentary fault currents are used to evaluate medium and high voltage fuses and the “closing and latching” capability (momentary rating) of medium and high voltage breakers. The fault currents reported in the “Momentary Duty Report” are calculated as follows:

- Motor and generator subtransient reactance values (Xd”) are adjusted per the first cycle duty multipliers described in IEEE Std 141-1993 (Red Book).

- The complex equivalent circuit impedance, Z, is calculated by network reduction of the “Z” (complex) network.

- The momentary symmetrical current = E/Z.

- The X/R ratio reported is equal to the equivalent circuit reactance, X, divided by the equivalent circuit resistance, R. As discussed above, X is calculated by the reduction of the “X” (reactive) network and R is calculated by the reduction of the “R” (resistive) network.

- A_FAULT calculates and reports the momentary asymmetrical current in two different ways, once as “sym*1.6” and again as “momentary based on X/R”. The “sym*1.6” value is the momentary symmetrical current multiplied by 1.6. The “momentary based on X/R” value is the momentary symmetrical current multiplied by

$$\sqrt{1+2e^{(-2\pi/(X/R))}}$$

3. Interrupting Duty Report

The fault currents reported in the “Interrupting Duty Report” are used to evaluate the interrupting rating of medium- and high-voltage breakers. The interrupting symmetrical current is calculated as follows:

- Motor and generator subtransient reactance values (Xd”) are adjusted per the interrupting duty multipliers described in IEEE Std 141-1993 (Red Book).

- The complex equivalent circuit impedance, Z, is calculated by network reduction of the “Z” (complex) network.

- The interrupting symmetrical current = E/Z.

- The X/R ratio reported is equal to the equivalent circuit reactance, X, divided by the equivalent circuit resistance, R. As discussed above, X is calculated by the reduction of the “X” (reactive) network and R is calculated by the reduction of the “R” (resistive) network.

- A_FAULT uses the calculated X/R ratio to determine the minimum contact parting time multiplying factors for 2, 3, 5, and 8 cycle breakers. The multiplying factors are based on IEEE Std C37.5-1979 and IEEE Std C37.010-1999 standards. The multiplying factors are applied to the interrupting symmetrical current in order to calculate the RMS short-circuit current interrupting duty for 2, 3, 5, and 8 cycle breakers. This duty is compared to the symmetrical current interrupting rating of the circuit breaker. NACD (No AC Decrement) ratios are calculated with consideration of generator "Local" and "Remote" contributions as outlined in IEEE Std C37.010-1999.

- Motor and generator impedance multipliers for the short-circuit calculations are summarized in the following table. This is based on the recommended combination network for comprehensive multi-voltage system calculations (from IEEE Std 141-1993; Red Book):

Machine Type	Impedance (First Cycle Duty)	Impedance (Interrupting Duty)
Turbine generators, Condensers, Hydrogenerators with amortisseur windings	1.0 Xd"	1.0 Xd"
Synchronous motors	1.0 Xd"	1.5 Xd"
Induction motors > 1000 hp at speed ≤ 1800 RPM, or > 250 hp at 3600 RPM.	1.0 Xd"	1.5 Xd"
Induction motors ≥ 50 hp not covered above.	1.2 Xd"	3.0 Xd"
Induction motors < 50 hp	1.67 Xd"	Neglect

Note: Xd" is the subtransient reactance of the rotating machine.

2.1 Short-Circuit Objectives

The objective of the short-circuit analysis is to calculate the maximum short-circuit currents produced by balanced three-phase and unbalanced faults at each bus shown on the one-line diagrams in Appendix C .

2.2 System Modeling

Short-circuit currents were calculated for a three-phase bolted fault and single-line-to-ground fault at each bus shown on the one-line diagrams found in Appendix C. The system was modeled for worst-case fault currents.

1. Study Case:

The following short-circuit study case was evaluated:

- BKR LVA-A - OPEN
- BKR LVA-B - CLOSED
- BKR TIE LVA - CLOSED

2. Utility Information:

The following upstream available fault current information was provided from the Power System Analysis Study by Square D on July 16, 2010 at the primary of the utility transformers:

- Voltage: 12.47 kV
- Three-phase fault current: 5,733 A, X/R= 5.122
- Single-line to ground fault current: 725 A, X/R=5.122

3. System Information:

Input data used in this study was obtained from the following sources:

- Contract drawings EP4-103 to EP4-106.
- 7/16/2010 Power system study performed by Square D of Schneider Electric.
- Eaton Electrical Services and Systems.
- Mare Solutions.

4. Assumptions:

The following assumptions were used in modeling the power system, and result in conservative, worst-case results:

- All motors were assumed to be running.
- Motor subtransient reactance is assumed to be 17%.
- System voltage is modeled at 100% nominal.
- The 480 V switchgear was modeled with the tie breaker closed and one main breaker open. The key interlock system at the main switchgear ensures only a single source (utility or generator) is connected; therefore, this configuration represents worst-case short-circuit conditions.
- The generator breaker at the main switchgear was assumed to be open (refer to previous comment). Calculations are included for available short-circuit contributions from the generator.
- Generator decrement curve is estimated based on assumed generator reactance values and constant short-circuit capability of 3X rated full load current.
- Unless otherwise provided, transformer X/R ratios are obtained from IEEE Std C37.010-1999. Typical design impedances published by Eaton were used to model the Cutler-Hammer dry-type transformers.

Complete information regarding the system model used for the computer simulation is included in Appendix A.

2.3 Short-Circuit Results

The results of the short-circuit analysis, including calculated branch contributions, are provided in Appendix B. The one-line diagrams with referenced bus identification are included in Appendix C.

2.4 Equipment Evaluation

The purpose of the equipment evaluation is to compare the ***maximum*** calculated short-circuit currents to the short-circuit ratings of protective devices. The comparison is made in order to determine if the device can interrupt or withstand the available fault currents of the electrical system to which the device is applied, as required by NEC-2011, Article 110.9 and NEC-2011, Article 110.10. The device evaluation follows the evaluation procedures outlined in IEEE Std C37.13-2008, IEEE Std C37.010-1999, IEEE Std C37.5-1979, IEEE Std C37.41™-2008, IEEE Std 1015™-2006 (Blue Book), and applicable ANSI, NEMA, and UL standards.

The results of the short-circuit equipment evaluation are summarized in Table 2.1. The table indicates “Bus I.D.” (corresponds to bus designations used in the one-line diagrams of Appendix C), “Manufacturer”, “Status” (Pass, fail, unknown, or marginal), “Type” (equipment category), “Equip Volts”, calculated short-circuit duty, the equipment short-circuit rating, the series rating (if applicable), and the maximum duty rating.

The maximum duty rating is calculated by:

$$\frac{S.C.duty}{DeviceS.C.Rating} \times 100$$

If the short-circuit rating of a device is not known, a MINIMUM REQUIRED short-circuit rating is listed. For equipment with series ratings, the maximum duty rating is calculated using the series rating instead of the individual device short-circuit rating. All short-circuit current values are reported in units of kA.

1. <u>For low voltage devices:</u>

The calculated short-circuit duty is reported under “Calc Isc kA" and the device short-circuit rating is reported under "Equip Isc kA". The calculated duty has been adjusted accordingly per the system X/R and device test X/R.

2. For medium/high voltage breakers:

The calculated *interrupting* short-circuit duty is reported under "Calc Isc kA" and the breaker short-circuit interrupting rating is reported under "Equip Isc kA". The interrupting duty has been adjusted per multiplying factors based on the breaker clearing time and system X/R. The calculated momentary duty (i.e. close-and-latch duty) is reported under "Calc Msc kA". The breaker momentary (i.e. close-and-latch) rating is reported under "Equip Msc kA".

3. For medium/high voltage fuses, switches, and motor starters:

The calculated *momentary symmetrical* short-circuit duty is reported under "Calc Isc kA" and the device's momentary symmetrical short-circuit rating is reported under "Equip Isc kA". The calculated *momentary asymmetrical* duty is reported under "Calc Msc kA". The device's momentary asymmetrical short-circuit rating is reported under "Equip Msc kA".

Table 2.1 - Equipment Evaluation

Bus	Manufacturer	Status	Type	Bus Voltage	Calc Isc kA	Dev Isc kA	Isc Rating%	Calc Mom kA	Dev Mom kA	Mom Rating%
1 HNB	CUTLER-HAMMER	Pass	LV Panelboard	480	14.53	25.00	58.11			
19-1LEQA	CUTLER-HAMMER	Pass	LV Panelboard	208	2.97 (*N1)	10.00	29.65			
19-1LNA	CUTLER-HAMMER	Pass	LV Panelboard	208	3.06 (*N1)	10.00	30.65			
1CA		Pass	LV Panelboard	208	1.99	18.00	11.06			
1CB		Pass	LV Panelboard	208	4.03	10.00	40.34			
1CC		Pass	LV Panelboard	208	2.31	10.00	23.11			
1CD		Pass	LV Panelboard	208	3.83	10.00	38.31			
1HCCB	CUTLER-HAMMER	Pass	LV Panelboard	480	14.16	25.00	56.64			
1HLSB	CUTLER-HAMMER	Pass	LV Panelboard	480	9.15	25.00	36.60			
1LCCA	CUTLER-HAMMER	Pass	LV Panelboard	208	7.48	22.00	34.01			
1LCCB	CUTLER-HAMMER	Pass	LV Panelboard	208	9.08 (*N1)	10.00	90.76			
1LCCC	CUTLER-HAMMER	Pass	LV Panelboard	208	2.78	10.00	27.82			
1LCCD	CUTLER-HAMMER	Pass	LV Panelboard	208	4.04	10.00	40.38			
1LCCE	CUTLER-HAMMER	Pass	LV Panelboard	208	3.94	10.00	39.37			
1LEQA	CUTLER-HAMMER	Pass	LV Panelboard	208	7.35	22.00	33.41			
1LEQB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.47 (*N1)	10.00	24.68			
1LLSA	CUTLER-HAMMER	Pass	LV Panelboard	208	4.11	10.00	41.07			
1LLSB	CUTLER-HAMMER	Pass	LV Panelboard	208	4.72 (*N1)	10.00	47.19			
1LLSC	CUTLER-HAMMER	Pass	LV Panelboard	208	2.26	10.00	22.61			
1LLSD	CUTLER-HAMMER	Pass	LV Panelboard	208	2.17	10.00	21.68			

Bus	Manufacturer	Status	Type	Bus Voltage	Calc Isc kA	Dev Isc kA	Isc Rating%	Calc Mom kA	Dev Mom kA	Mom Rating%
1LNA	CUTLER-HAMMER	Pass	LV Panelboard	208	9.23	22.00	41.97			
1LNB	CUTLER-HAMMER	Pass	LV Panelboard	208	9.51 (*N1)	10.00	95.10			
1LNC	CUTLER-HAMMER	Pass	LV Panelboard	208	3.21	10.00	32.10			
1WC		Pass	LV Panelboard	208	3.74	10.00	37.36			
2HEQA	CUTLER-HAMMER	Pass	LV Panelboard	480	10.58	25.00	42.32			
2HEQB	CUTLER-HAMMER	Pass	LV Panelboard	480	12.99	25.00	51.97			
2HNA	CUTLER-HAMMER	Pass	LV Panelboard	480	10.49	25.00	41.94			
2HNB	CUTLER-HAMMER	Pass	LV Panelboard	480	13.77	25.00	55.07			
2LCCA	CUTLER-HAMMER	Pass	LV Panelboard	208	7.21	22.00	32.79			
2LCCB	CUTLER-HAMMER	Pass	LV Panelboard	208	8.02 (*N1)	10.00	80.22			
2LCCC	CUTLER-HAMMER	Pass	LV Panelboard	208	3.80	10.00	37.96			
2LCCD	CUTLER-HAMMER	Pass	LV Panelboard	208	3.66	10.00	36.57			
2LCCE	CUTLER-HAMMER	Pass	LV Panelboard	208	3.43	10.00	34.31			
2LCCF	CUTLER-HAMMER	Pass	LV Panelboard	208	3.43	10.00	34.31			
2LEQA	CUTLER-HAMMER	Pass	LV Panelboard	208	7.61 (*N1)	10.00	76.08			
2LEQB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.66 (*N1)	10.00	26.62			
2LLSA	CUTLER-HAMMER	Pass	LV Panelboard	208	3.90	10.00	39.05			
2LLSB	CUTLER-HAMMER	Pass	LV Panelboard	208	3.91 (*N1)	10.00	39.10			
2LLSC	CUTLER-HAMMER	Pass	LV Panelboard	208	1.96	10.00	19.64			
2LLSD	CUTLER-HAMMER	Pass	LV Panelboard	208	2.39	10.00	23.86			

Bus	Manufacturer	Status	Type	Bus Voltage	Calc Isc kA	Dev Isc kA	Isc Rating%	Calc Mom kA	Dev Mom kA	Mom Rating%
2LNA	CUTLER-HAMMER	Pass	LV Panelboard	208	8.83	22.00	40.12			
2LNB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.67 (*N1)	10.00	26.72			
3A1	SQUARE D	Pass	LV Panelboard	208	3.87	18.00	21.49			
3HCCB	CUTLER-HAMMER	Pass	LV Panelboard	480	12.30	25.00	49.20			
3HLSB	CUTLER-HAMMER	Pass	LV Panelboard	480	7.64	14.00	54.60			
3HNB	CUTLER-HAMMER	Pass	LV Panelboard	480	13.08	25.00	52.33			
3LCCA	CUTLER-HAMMER	Pass	LV Panelboard	208	5.96	22.00	27.09			
3LCCB	CUTLER-HAMMER	Pass	LV Panelboard	208	4.24	10.00	42.40			
3LCCC	CUTLER-HAMMER	Pass	LV Panelboard	208	4.15	10.00	41.48			
3LEQA	CUTLER-HAMMER	Pass	LV Panelboard	208	7.61 (*N1)	10.00	76.08			
3LEQB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.45 (*N1)	10.00	24.52			
3LLSA	CUTLER-HAMMER	Pass	LV Panelboard	208	3.90	10.00	39.05			
3LLSB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.23 (*N1)	10.00	22.29			
3LLSC	CUTLER-HAMMER	Pass	LV Panelboard	208	1.91	10.00	19.13			
3LLSD	CUTLER-HAMMER	Pass	LV Panelboard	208	1.52	10.00	15.16			
3LNA	CUTLER-HAMMER	Pass	LV Panelboard	208	6.77	22.00	30.75			
3LNB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.66 (*N1)	10.00	26.63			
3LNC	CUTLER-HAMMER	Pass	LV Panelboard	208	4.50	10.00	45.03			
4C	CUTLER-HAMMER	Pass	LV Panelboard	208	4.00	18.00	22.20			
4DP	CUTLER-HAMMER	Pass	LV Panelboard	208	3.79 (*N1)	10.00	37.86			

Bus	Manufacturer	Status	Type	Bus Voltage	Calc Isc kA	Dev Isc kA	Isc Rating%	Calc Mom kA	Dev Mom kA	Mom Rating%
4EML	CUTLER-HAMMER	Pass	LV Panelboard	208	3.36	18.00	18.67			
4HEQA	CUTLER-HAMMER	Pass	LV Panelboard	480	10.16	25.00	40.65			
4HEQB	CUTLER-HAMMER	Pass	LV Panelboard	480	12.09	25.00	48.36			
4HNA	CUTLER-HAMMER	Pass	LV Panelboard	480	6.93	25.00	27.73			
4HNB	CUTLER-HAMMER	Pass	LV Panelboard	480	12.46	25.00	49.83			
4L	CUTLER-HAMMER	Pass	LV Panelboard	208	3.60 (*N1)	10.00	36.04			
4LA	CUTLER-HAMMER	Pass	LV Panelboard	208	3.48	18.00	19.36			
4LCCA	CUTLER-HAMMER	Pass	LV Panelboard	208	6.22 (*N1)	10.00	62.16			
4LCCB	CUTLER-HAMMER	Pass	LV Panelboard	208	4.18 (*N1)	10.00	41.84			
4LEQA	CUTLER-HAMMER	Pass	LV Panelboard	208	7.10 (*N1)	10.00	71.01			
4LEQB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.65 (*N1)	10.00	26.49			
4LEQC	CUTLER-HAMMER	Pass	LV Panelboard	208	4.05	10.00	40.46			
4LLSA	CUTLER-HAMMER	Pass	LV Panelboard	208	3.72	10.00	37.20			
4LLSB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.04 (*N1)	10.00	20.35			
4LLSC	CUTLER-HAMMER	Pass	LV Panelboard	208	2.19	10.00	21.93			
4LLSD	CUTLER-HAMMER	Pass	LV Panelboard	208	1.39	10.00	13.90			
4LNA	CUTLER-HAMMER	Pass	LV Panelboard	208	6.88 (*N1)	10.00	68.76			
4LNB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.65 (*N1)	10.00	26.55			
4LNC	CUTLER-HAMMER	Pass	LV Panelboard	208	3.26	10.00	32.59			
5HCCB	CUTLER-HAMMER	Pass	LV Panelboard	480	10.92	25.00	43.69			

Bus	Manufacturer	Status	Type	Bus Voltage	Calc Isc kA	Dev Isc kA	Isc Rating%	Calc Mom kA	Dev Mom kA	Mom Rating%
5HLSB	CUTLER-HAMMER	Pass	LV Panelboard	480	6.63	25.00	26.51			
5HNB	CUTLER-HAMMER	Pass	LV Panelboard	480	11.89	25.00	47.56			
5LCCA	CUTLER-HAMMER	Pass	LV Panelboard	208	6.13 (*N1)	10.00	61.27			
5LCCB	CUTLER-HAMMER	Pass	LV Panelboard	208	4.80 (*N1)	10.00	47.99			
5LEQA	CUTLER-HAMMER	Pass	LV Panelboard	208	6.98 (*N1)	10.00	69.84			
5LEQB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.22	10.00	22.20			
5LLSA	CUTLER-HAMMER	Pass	LV Panelboard	208	3.72	10.00	37.20			
5LLSB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.19 (*N1)	10.00	21.89			
5LNA	CUTLER-HAMMER	Pass	LV Panelboard	208	6.77 (*N1)	10.00	67.67			
5LNB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.65 (*N1)	10.00	26.47			
6HEQA	CUTLER-HAMMER	Pass	LV Panelboard	480	9.68	25.00	38.73			
6HEQB	CUTLER-HAMMER	Pass	LV Panelboard	480	11.06	25.00	44.24			
6HNA	CUTLER-HAMMER	Pass	LV Panelboard	480	9.70	25.00	38.78			
6HNB	CUTLER-HAMMER	Pass	LV Panelboard	480	11.37	25.00	45.48			
6LCCA	CUTLER-HAMMER	Pass	LV Panelboard	208	5.79 (*N1)	10.00	57.93			
6LCCB	CUTLER-HAMMER	Pass	LV Panelboard	208	4.28 (*N1)	10.00	42.82			
6LEQA	CUTLER-HAMMER	Pass	LV Panelboard	208	6.55 (*N1)	10.00	65.54			
6LEQB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.34	10.00	23.38			
6LLSA	CUTLER-HAMMER	Pass	LV Panelboard	208	3.55	10.00	35.51			
6LLSB	CUTLER-HAMMER	Pass	LV Panelboard	208	1.99 (*N1)	10.00	19.86			

Bus	Manufacturer	Status	Type	Bus Voltage	Calc Isc kA	Dev Isc kA	Isc Rating%	Calc Mom kA	Dev Mom kA	Mom Rating%
6LNA	CUTLER-HAMMER	Pass	LV Panelboard	208	6.36 (*N1)	10.00	63.62			
6LNB	CUTLER-HAMMER	Pass	LV Panelboard	208	2.64 (*N1)	10.00	26.38			
7-1LNA	CUTLER-HAMMER	Pass	LV Panelboard	208	12.19	65.00	18.75			
7-1LNB	CUTLER-HAMMER	Pass	LV Panelboard	208	9.13 (*N1)	10.00	91.26			
7-1NLC	CUTLER-HAMMER	Pass	LV Panelboard	208	6.39 (*N1)	10.00	63.90			
ATS 7 Load Side		Pass	ATS Unit	4160	4.38	65.00	6.74	5.89	65.00	9.06
BHCCA	CUTLER-HAMMER	Pass	LV Switchboard	480	14.15	65.00	21.76			
BHCCB	CUTLER-HAMMER	Pass	LV Panelboard	480	15.02	35.00	42.91			
BHEQA	CUTLER-HAMMER	Pass	LV Switchboard	480	14.38	65.00	22.12			
BHEQB	CUTLER-HAMMER	Pass	LV Panelboard	480	14.82	35.00	42.35			
BHLSA	CUTLER-HAMMER	Pass	LV Panelboard	480	8.55	35.00	24.43			
BHLSB	CUTLER-HAMMER	Pass	LV Panelboard	480	9.59	35.00	27.40			
BHNA	CUTLER-HAMMER	Pass	LV Switchboard	480	15.01	65.00	23.09			
BHNB	CUTLER-HAMMER	Pass	LV Panelboard	480	15.70	35.00	44.85			
BLCCA	CUTLER-HAMMER	Pass	LV Switchboard	208	10.96	65.00	16.87			
BLCCB	CUTLER-HAMMER	Pass	LV Panelboard	208	11.06	22.00	50.29			
BLCCC	CUTLER-HAMMER	Pass	LV Panelboard	208	2.47	10.00	24.71			
BLCCD	CUTLER-HAMMER	Pass	LV Panelboard	208	6.52	22.00	29.65			
BLCCE	CUTLER-HAMMER	Pass	LV Panelboard	208	4.24	10.00	42.41			
BLEQA	CUTLER-HAMMER	Pass	LV Switchboard	208	14.14	65.00	21.75			

Bus	Manufacturer	Status	Type	Bus Voltage	Calc Isc kA	Dev Isc kA	Isc Rating%	Calc Mom kA	Dev Mom kA	Mom Rating%
BLEQB	CUTLER-HAMMER	Pass	LV Panelboard	208	5.03 (*N1)	10.00	50.26			
BLEQC	CUTLER-HAMMER	Pass	LV Panelboard	208	2.97	10.00	29.71			
BLEQD	CUTLER-HAMMER	Pass	LV Panelboard	208	2.86	10.00	28.60			
BLEQE	CUTLER-HAMMER	Pass	LV Panelboard	208	7.75 (*N1)	10.00	77.46			
BLEQF	CUTLER-HAMMER	Pass	LV Panelboard	208	6.91 (*N1)	10.00	69.14			
BLEQG	CUTLER-HAMMER	Pass	LV Panelboard	208	5.94	10.00	59.41			
BLEQH	CUTLER-HAMMER	Pass	LV Panelboard	208	7.97 (*N1)	10.00	79.69			
BLEQI	CUTLER-HAMMER	Pass	LV Panelboard	208	7.16	10.00	71.61			
BLEQJ	CUTLER-HAMMER	Pass	LV Panelboard	208	2.66	10.00	26.58			
BLLSA	CUTLER-HAMMER	Pass	LV Panelboard	208	8.36 (*N1)	10.00	83.62			
BLLSB	CUTLER-HAMMER	Pass	LV Panelboard	208	3.91 (*N1)	10.00	39.10			
BLLSC	CUTLER-HAMMER	Pass	LV Panelboard	208	1.87	10.00	18.72			
BLLSD	CUTLER-HAMMER	Pass	LV Panelboard	208	4.70	10.00	46.99			
BLLSE	CUTLER-HAMMER	Pass	LV Panelboard	208	3.61	10.00	36.10			
BLLSF	CUTLER-HAMMER	Pass	LV Panelboard	208	3.76	10.00	37.65			
BLLSG	CUTLER-HAMMER	Pass	LV Panelboard	208	2.29	10.00	22.94			
BLNA	CUTLER-HAMMER	Pass	LV Switchboard	208	15.39	65.00	23.67			
BLNC	CUTLER-HAMMER	Pass	LV Panelboard	208	3.77	10.00	37.67			
BLND	CUTLER-HAMMER	Pass	LV Panelboard	208	9.72 (*N1)	10.00	97.23			
BLNE	CUTLER-HAMMER	Pass	LV Panelboard	208	5.28	10.00	52.77			

Bus	Manufacturer	Status	Type	Bus Voltage	Calc Isc kA	Dev Isc kA	Isc Rating%	Calc Mom kA	Dev Mom kA	Mom Rating%
BLNF	CUTLER-HAMMER	Pass	LV Panelboard	208	3.45	10.00	34.50			
CCSWBD	CUTLER-HAMMER	Pass	LV Switchboard	480	21.53 (*N1)	65.00	33.12			
DIST PNL R	CUTLER-HAMMER	Pass	LV Panelboard	208	7.53	65.00	11.58			
EQSWBD	CUTLER-HAMMER	Pass	LV Switchboard	480	21.58 (*N1)	65.00	33.20			
EQUIP RM 372		Pass	LV Panelboard	208	1.61	10.00	16.07			
LSSWBD	CUTLER-HAMMER	Pass	LV Switchboard	480	20.20 (*N1)	65.00	31.08			
LVA-A	CUTLER-HAMMER	Pass	LV Switchgear	480	21.87 (*N1)	65.00	33.65			
LVA-B	CUTLER-HAMMER	Pass	LV Switchgear	480	22.00 (*N1)	65.00	33.85			
MP5C-1	CUTLER-HAMMER	Pass	LV Panelboard	208	4.68 (*N1)	10.00	46.82			
MP5C-2	CUTLER-HAMMER	Pass	LV Panelboard	208	4.62 (*N1)	10.00	46.21			
MVS 1	CUTLER-HAMMER	Pass	MV Switchgear	4160	4.38	25.00	17.50	6.05	40.00	15.13
MVS 2	CUTLER-HAMMER	Pass	MV Switchgear	4160	4.38	25.00	17.50	6.05	40.00	15.13
PHEQA	CUTLER-HAMMER	Pass	LV Panelboard	480	11.52	25.00	46.07			
PLEQA	CUTLER-HAMMER	Pass	LV Panelboard	208	8.71	22.00	39.57			
PLNA	CUTLER-HAMMER	Pass	LV Panelboard	208	4.78	10.00	47.80			
PNL A	SQUARE D	Pass	LV Panelboard	208	2.48	18.00	13.78			
PNL BIO MED		Pass	LV Panelboard	208	1.74	10.00	17.43			
PNL L	SQUARE D	Pass	LV Panelboard	208	2.62	10.00	26.23			
PNL R	SQUARE D	Pass	LV Panelboard	208	2.62	10.00	26.23			
PNL UTIL SHOP 1	SQUARE D	Pass	LV Panelboard	208	5.83	18.00	32.39			

Bus	Manufacturer	Status	Type	Bus Voltage	Calc Isc kA	Dev Isc kA	Isc Rating%	Calc Mom kA	Dev Mom kA	Mom Rating%
PNL UTIL SHOP 2	SQUARE D	Pass	LV Panelboard	208	3.70	18.00	20.58			
PNL UTIL SHOP 3	SQUARE D	Pass	LV Panelboard	208	3.45	18.00	19.17			
RP6L	CUTLER-HAMMER	Pass	LV Panelboard	208	2.31	10.00	23.11			
RP6R	CUTLER-HAMMER	Pass	LV Panelboard	208	2.63	65.00	4.04			
SWGR 1	CUTLER-HAMMER	Pass	MV Switchgear	4160	4.40	25.00	17.59	6.08	40.00	15.19
SWGR 2	CUTLER-HAMMER	Pass	MV Switchgear	4160	4.46	25.00	17.83	6.24	40.00	15.60
SWGR PARALLEL	CUTLER-HAMMER	Pass	LV Switchgear	480	18.29 (*N1)	65.00	28.14			

(*N1) System X/R higher than Test X/R, Calc Isc kA modified based on low voltage factor.

3.0 PROTECTIVE DEVICE COORDINATION STUDY

The protective device coordination study determines overcurrent protective relay and circuit breaker settings in order to provide an optimal compromise between protection and selectivity.

The coordination plots were developed using SKM System Analysis' CAPTOR software. Protective device coordination was performed in accordance with IEEE Std 242™-2001 (Buff Book). Minimum guidelines for equipment protection, as outlined in the National Electrical Code (NEC) and applicable standards of the American National Standards Institute (ANSI), were followed.

3.1 General Description and Protection Philosophy

Using the appropriate maximum fault currents, the time-current coordination curves were plotted as operating time versus current magnitudes to show protective device tripping and/or clearing characteristics and coordination among these devices.

Consideration was given to provide both selective isolation of faults and maximum protection of equipment such as cables, transformers, motors, etc.

To achieve the optimum protection and selectivity, the following guidelines were followed throughout the study:

1. Ideally, the settings of any overcurrent device should be high enough to permit the continuous full-load operating capacity of the cables and the equipment they supply, and to ride through system temporary disturbances such as in-rush current. On the other hand, the settings should be low enough to provide overload and short-circuit protection under minimum fault conditions.

2. Considering any two protective devices in series:

    - The maximum available fault current at the downstream device determines the upper limit of the coordination range between these two devices.

    - The minimum available fault current at the downstream device or the pick-up setting of the upstream device determines the lower limit of the coordination range.

    - Series instantaneous devices do not coordinate unless there is sufficient impedance between the two devices.

- When plotting coordination curves, certain time intervals must be maintained between the curves in order to ensure correct selectivity. These time intervals vary, depending on the device types. In general, however, the following must be taken into consideration when determining the appropriate time separation interval: Breaker clearing time, relay tolerances, induction disk over-travel, and a reasonable safety margin for error.

3.2 Codes and Standards

The minimum protection requirements as outlined in the National Electric Code (NEC), ANSI and IEEE Standards were used as guidelines for protective device settings.

Applicable requirements are summarized below.

1. Cables

Power cables require overload and short-circuit protection in order to meet the requirements stated in NEC-2011, Article 240 and IEEE Std 242-2001 (Buff Book). Table 3.1 summarizes these limitations to the pick-up settings of the protective devices designated for cable protection. NEC further requires that the ampacity of low voltage cable (0-2000 Volts) be determined by NEC-2011, Article 310.15. Cable de-rating based upon ambient temperature and the number of current carrying conductors in a raceway must also be applied. Medium voltage cable (2001-35,000 Volts) ampacity is defined by NEC-2011, Article 240.100(A) and NEC-2011, Article 310.60.

Table 3.1 - NEC Conductor Overcurrent Protective Levels

Voltage Class	<600 V			> 600 V (a)	
Equipment Supplied	Circuit Breaker, Relay (b)	Fuse	Thermal Device	Circuit Breaker, Relay (b)	Fuse (c)
Transformer	<1.0X	<1.0X	(d)	<6.0X	<3.0X
Motor	<1.0X	<1.0X	<1.0X	<6.0X	<3.0X
Feeder	<1.0X	<1.0X	(d)	<6.0X	<3.0X

Remarks:

a. The operating time of the protective device, the available short-circuit current, and the conductor used should be coordinated to prevent damaging or dangerous temperatures in the conductors and conductor insulation under short-circuit conditions (NEC-2011, Article 240). In coordinating system protection, the cable should withstand the maximum through short-circuit current for a time equivalent to the tripping time of the phase overcurrent relay (IEEE Std 242-2001, Section 9.4.4.2).

b. Values represent long-delay pick-up for the low voltage circuit breakers; tap setting for relays. Per NEC 2011, for breakers rated ≤ 800 amperes, the next highest trip rating is permitted. Breakers rated > 800 amperes; the ampacity of the conductor must be equal to or greater than the breaker rating.

c. Fuse continuous current rating.

d. Not allowed in NEC-2011, Article 240.9.

2. Transformers

The transformers should have protective devices on either the primary or on both primary and secondary windings in order to meet the basic protection requirements for overloads and short-circuit withstand values. In addition, the transformer protective devices must be able to withstand magnetizing inrush currents without tripping.

NEC protection requirements for transformers: Overcurrent devices should be selected and settings should be recommended to provide overcurrent protection in accordance with NEC-2011, Article 450.3. Paragraph (A) specifies that transformers over 600 V comply with Table 450.3(A). Paragraph (b) specifies that transformers less than 600 V comply with Table 450.3(B).

Table 3.2 – NEC-2011 Table 450.3(A) Maximum Rating or Setting of Overcurrent Protection for Transformers Over 600 Volts

Location Limitations	Transformer Rated Impedance	Primary Protection over 600 Volts		Secondary Protection (Note 2)		
				Over 600 Volts		600 Volts or Less
		Circuit Breaker (Note 4)	Fuse Rating	Circuit Breaker (Note 4)	Fuse Rating	Circuit Breaker or Fuse Rating
Any Location	Not more than 6%	600% (Note 1)	300% (Note 1)	300% (Note 1)	250% (Note 1)	125% (Note 1)
	Greater than 6% and not more than 10%	400% (Note 1)	300% (Note 1)	250% (Note 1)	225% (Note 1)	125% (Note 1)
Supervised Locations Only (Note 3)	Any	300% (Note 1)	250% (Note 1)	Not Required	Not Required	Not Required
	Not more than 6%	600%	300%	300% (Note 5)	250% (Note 5)	250% (Note 5)
	Greater than 6% and not more than 10%	400%	300%	250% (Note 5)	225% (Note 5)	250% (Note 5)

Note 1: Where the required fuse rating or circuit breaker setting does not correspond to a standard rating or setting, a higher rating or setting that does not exceed the next higher standard rating or setting shall be permitted.

Note 2: Where secondary overcurrent protection is required, the secondary overcurrent device shall be permitted to consist of not more than six circuit breakers or six sets of fuses grouped in one location. Where multiple overcurrent devices are utilized, the total of all the device ratings shall not exceed the allowed value of a single overcurrent device. If both circuit breakers and fuses are used as the overcurrent device, the total of the device ratings shall not exceed that allowed for fuses.

Note 3: A supervised location is a location where conditions of maintenance and supervision ensure that only qualified person monitor and service the transformer installation.

Note 4: Electronically actuated fuses that may be set to open at a specific current shall be set in accordance with settings for circuit breakers.

Note 5: A transformer equipped with a coordinated thermal overload protection by the manufacturer shall be permitted to have separate secondary protection omitted.

Table 3.3 – NEC-2011 Table 450.3(B) Maximum Rating or Setting of Overcurrent Protection for Transformers 600 Volts and Less

Protection Method	Primary Protection			Secondary Protection (Note 2)	
	Currents of 9 amperes or more	Currents less than 9 amperes	Currents less than 2 Amperes	Currents of 9 amperes or more	Currents less than 9 amperes
Primary only protection	125% (Note 1)	167%	300%	Not Required	Not Required
Primary and secondary protection	250% (Note 3)	250% (Note 3)	250% (Note 3)	125% (Note 1)	167%

Note 1: Where 125% of this current does not correspond to a standard rating of a fuse or nonadjustable circuit breaker, a higher rating that does not exceed the next higher standard rating shall be permitted.

Note 2: Where secondary overcurrent protection is required, the secondary overcurrent device shall be permitted to consist of not more than six circuit breakers or six sets of fuses grouped in one location. Where multiple overcurrent devices are utilized, the total of all the device ratings shall not exceed the allowed value of a single overcurrent device. If both breakers and fuses are utilized as the overcurrent device, the total of the device ratings shall not exceed that allowed for fuses.

Note 3: A transformer equipped with coordinated thermal overload protection by the manufacturer and arranged to interrupt the primary current shall be permitted to have primary overcurrent protection rated or set at a current value that is not more than six times the rated current of the transformer for transformers having not more than 6 percent impedance and not more than four times the rated current of the transformer for transformers having more than 6 percent but not more than 10 percent impedance.

Short-circuit thermal limits for transformers: The primary devices should be set on the basis that the transformers have short-circuit withstand capabilities as defined by IEEE Std C57.109™-1993.

3. Motors

The motors should have appropriate protective devices to meet the basic protection requirements for overloads and fault current withstand values. In addition, the motor short-circuit and ground fault protective devices should be set to ride through motor starting current.

3.3 Coordination Objectives

Develop time-current coordination plots to derive coordinated settings for the protective devices at VA Medical Center, Clarksburg, WV.

3.4 Coordination Results

The normal system coordination began at the 12.47 kV transformer fuses and continued downstream through Switchgear LVA to the largest feeder breaker at each panelboard. The emergency system coordination began at the generator breakers and continued downstream through Switchboard SWGR Parallel to the largest feeder breaker at each panelboard.

As shown on the time-current plots, each device curve is tagged with an arrow and label referencing its location on the plot's individual representative one line diagram. This label also references the device to its' specific manufacturer information, including ratings and settings, as indicated in the text box on each plot. The device time-current characteristics are truncated at maximum through-fault current for a downstream fault.

Efforts were made to provide the best coordination possible with the protective devices supplied under this contract. Areas where breaker trip curves overlap indicate areas of possible non-selective breaker operation. Where possible, efforts were made to reduce non-selective breaker operation while maintaining adequate system protection. In some cases, because of device limitations, little can be done to improve selective coordination. Such device limitations include the fixed operating characteristic of a fuse, the built-in instantaneous or instantaneous "over-ride" elements of molded case circuit breakers, and the limited instantaneous trip range of trip units with an instantaneous trip function.

In cases involving redundant protective devices, non-selective breaker operation is of little or no concern. Protective devices are redundant if, regardless of which device opens, the same system outage occurs. Often, in order to improve overall system protection and coordination, redundant devices are intentionally set to overlap (i.e. non-selectively coordinate with) one another. The feeder breakers in the LVA Switchgear are intentionally overlapped with the redundant downstream devices. This was done to improve coordination with the main 4160V Switchgear. It is suggested that VA Clarksburg consider the installation of a larger utility service. A larger utility service would allow for better coordination of downstream devices. The information provided to Eaton suggests that the existing utility transformers have a combined base rating of 5 MVA. The combined base rating of the new 480V unit substation transformers added under this project is 3 MVA.

Settings for relays upstream of RLY F NORM PC 1 and RLY F NORM PC 2 were taken from the previous Square D study and used in this report. Settings changes are not necessary for these relays at this time. An outage to verify the 150E fuse type on the 12.47 kV transformer winding could not be scheduled. The fuse holder manufacturer is known to be S&C. Therefore S&C type SM-4 fuses were used in this analysis, with the approval of Mare Solutions.

Adequate protection is achieved using the recommended protective devices, with settings and ratings as listed in Section 4. The recommended adjustments would maximize coordination in an attempt to allow the various downstream devices to isolate faults without operation of the upstream devices. Although instantaneous trip devices provide the highest degree of protection, when applied in series they compromise selectivity at high-magnitude fault currents.

It is recommended that ground fault protection not be used on the load side of the automatic transfer switches, per NEC 2008 Article 517.17. These locations include busses EQSWBD, CCSWBD, and BHEQA. However, coordinated ground fault settings are provided in the settings table within this report.

Note that phase coordination for circuit breakers downstream of the generator switchgear was based on the assumption that the two (2) generators are online. To account for the current division amongst the two generators, the curves for the generator feeder breakers and generator main breakers in the generator switchgear are multiplied by 2 (in the current domain) to account for only 1/2 of the fault current flowing through each circuit breaker. This shifts the time-current curves for the generators and illustrates the actual coordination during a fault with the two generators online.

3.5 Coordination Recommendations

All of the adjustable low voltage electronic trip and thermal magnetic circuit breakers and medium voltage equipment should be tested and adjusted according to the recommended settings given in Section 4.

It is recommended that ground fault protection not be used on the load side of the automatic transfer switches, per NEC 2008 Article 517.17. These locations include busses EQSWBD, CCSWBD, and BHEQA. However, coordinated ground fault settings are provided in the settings table within this report.

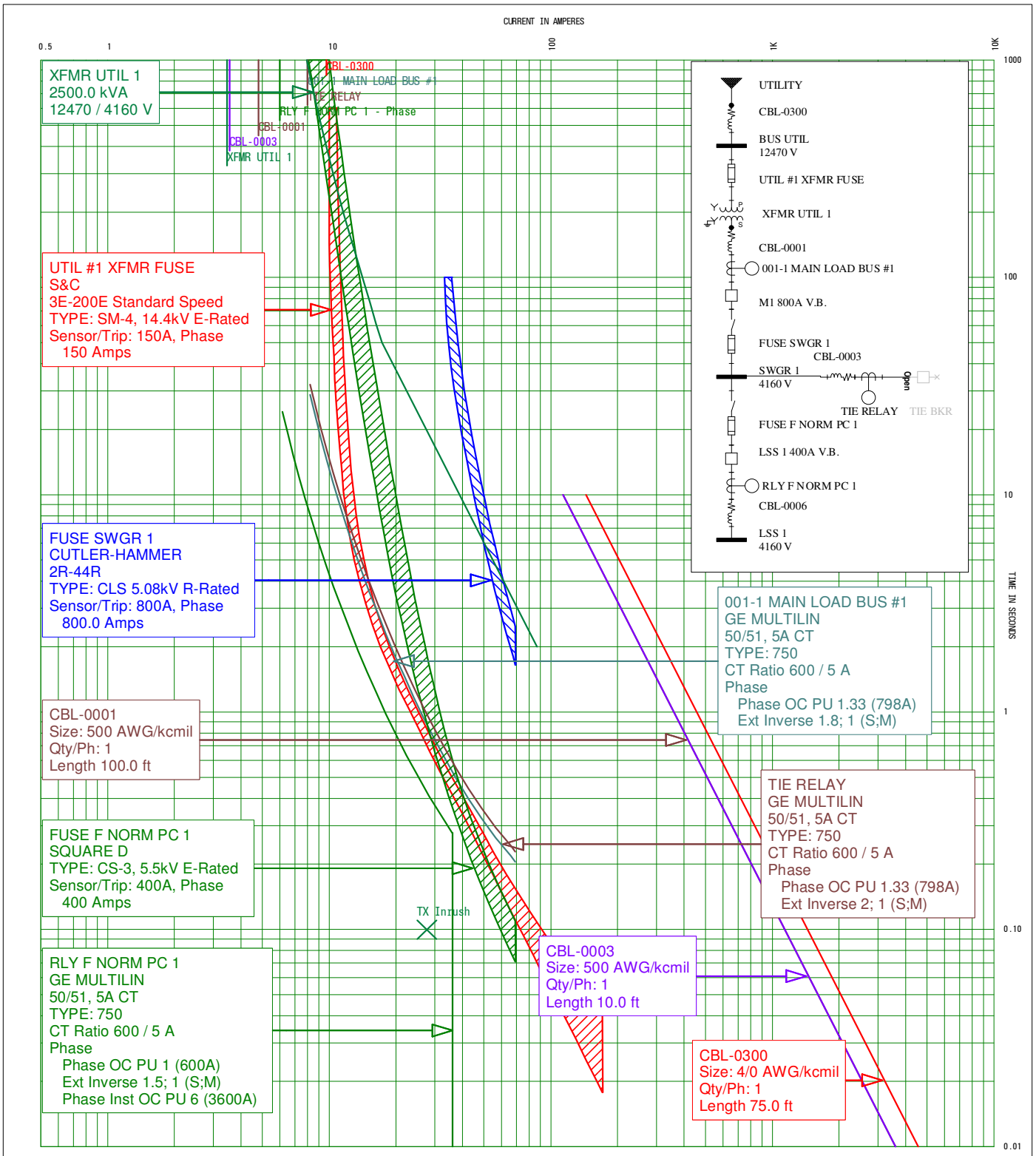
3.6 Time-Current Characteristic Plots

Refer to the following pages for the plotted coordination curves, which graphically indicate the degree of selectivity and protection obtained.

In some cases, a single time-current curve may be applicable to several locations in the system, where each location utilizes substantially similar devices and serves similar loads.

The following list references the attached time-current curves for this report.

Table 3.4 – TCC Plots Index



Eaton Electrical Services and Systems
November 28, 2012

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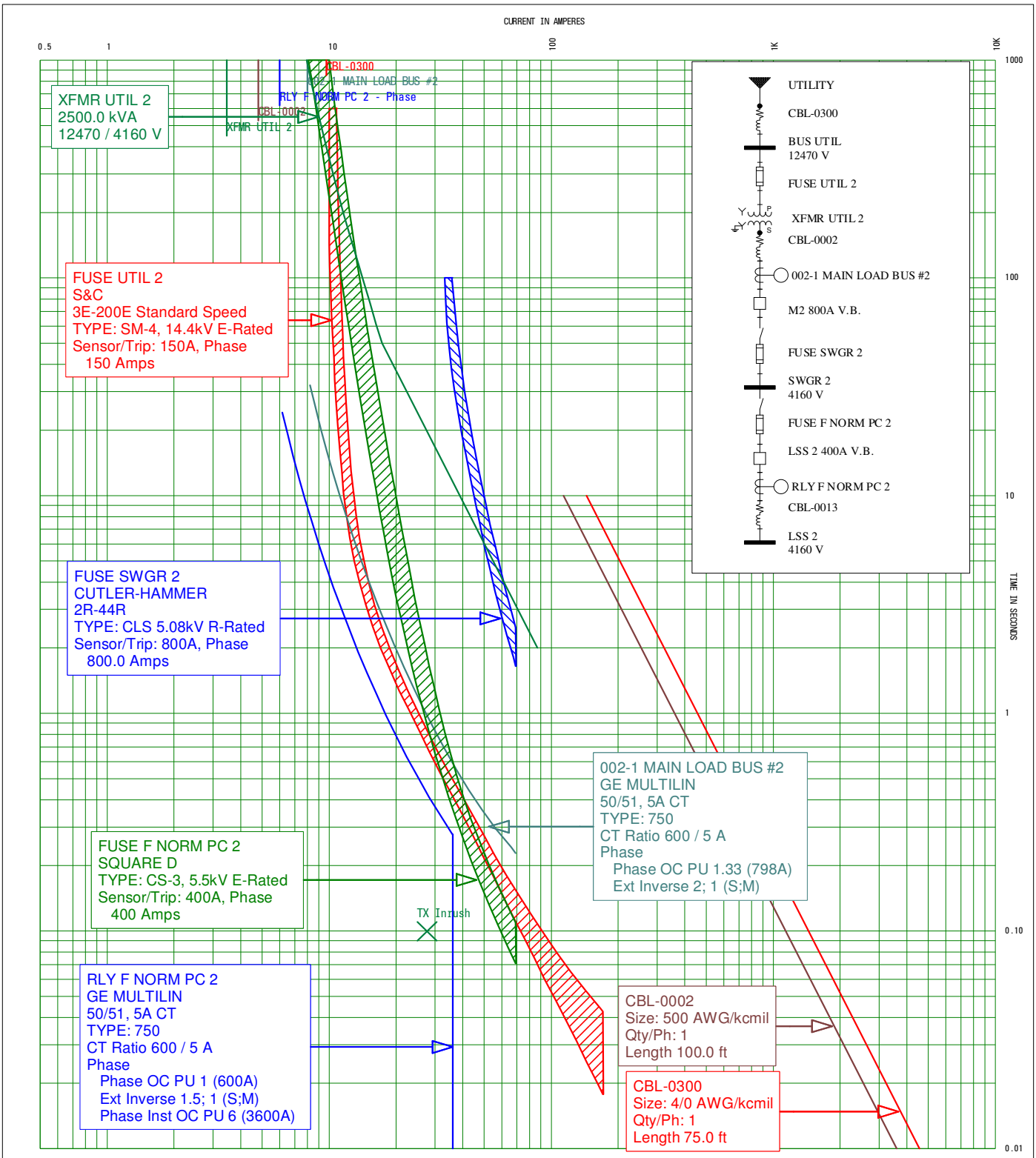
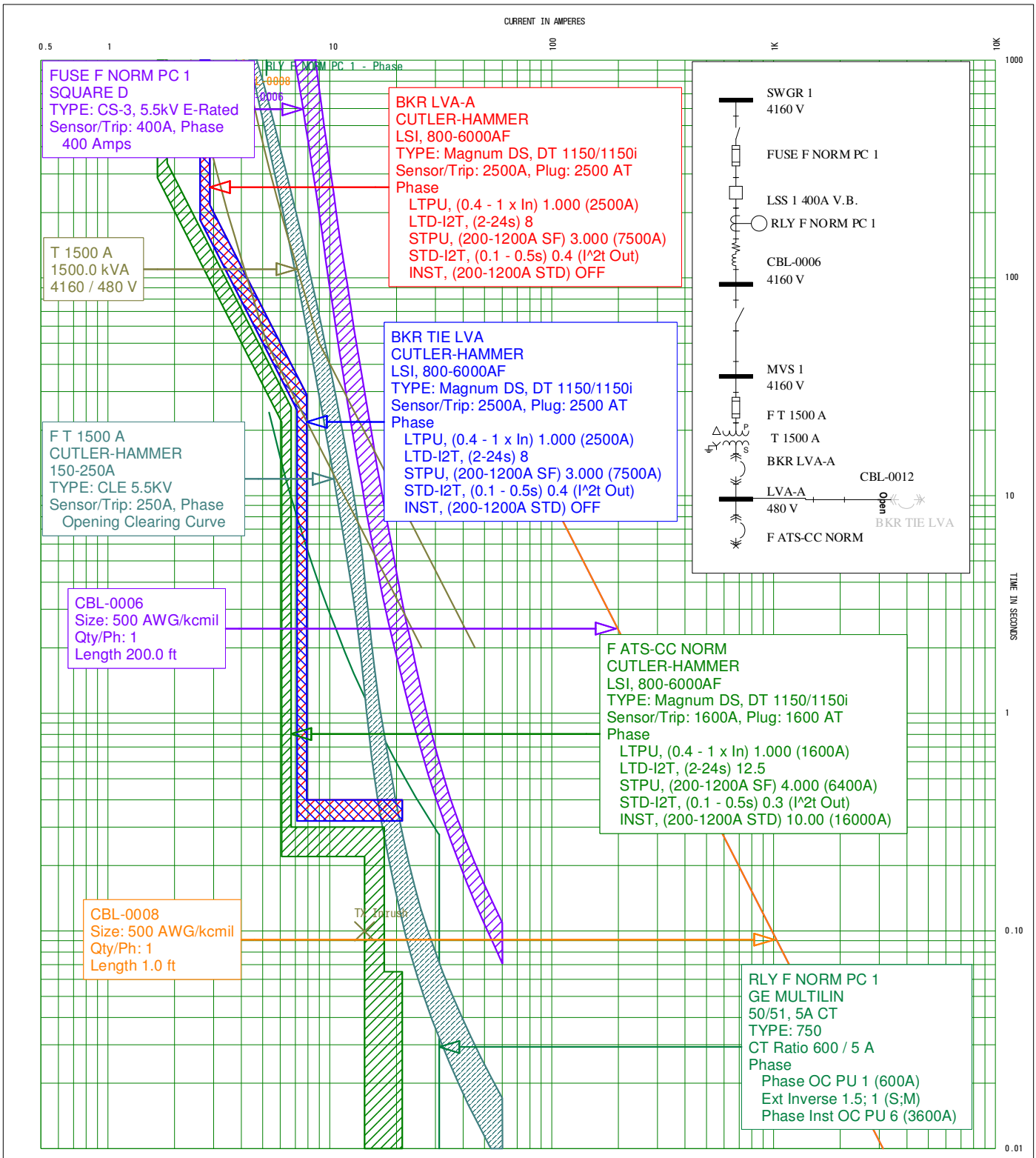
Ref. Voltage: 4160V
Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 02_Main 2 Coord Ref. Voltage: 4160V Current Scale: x 100



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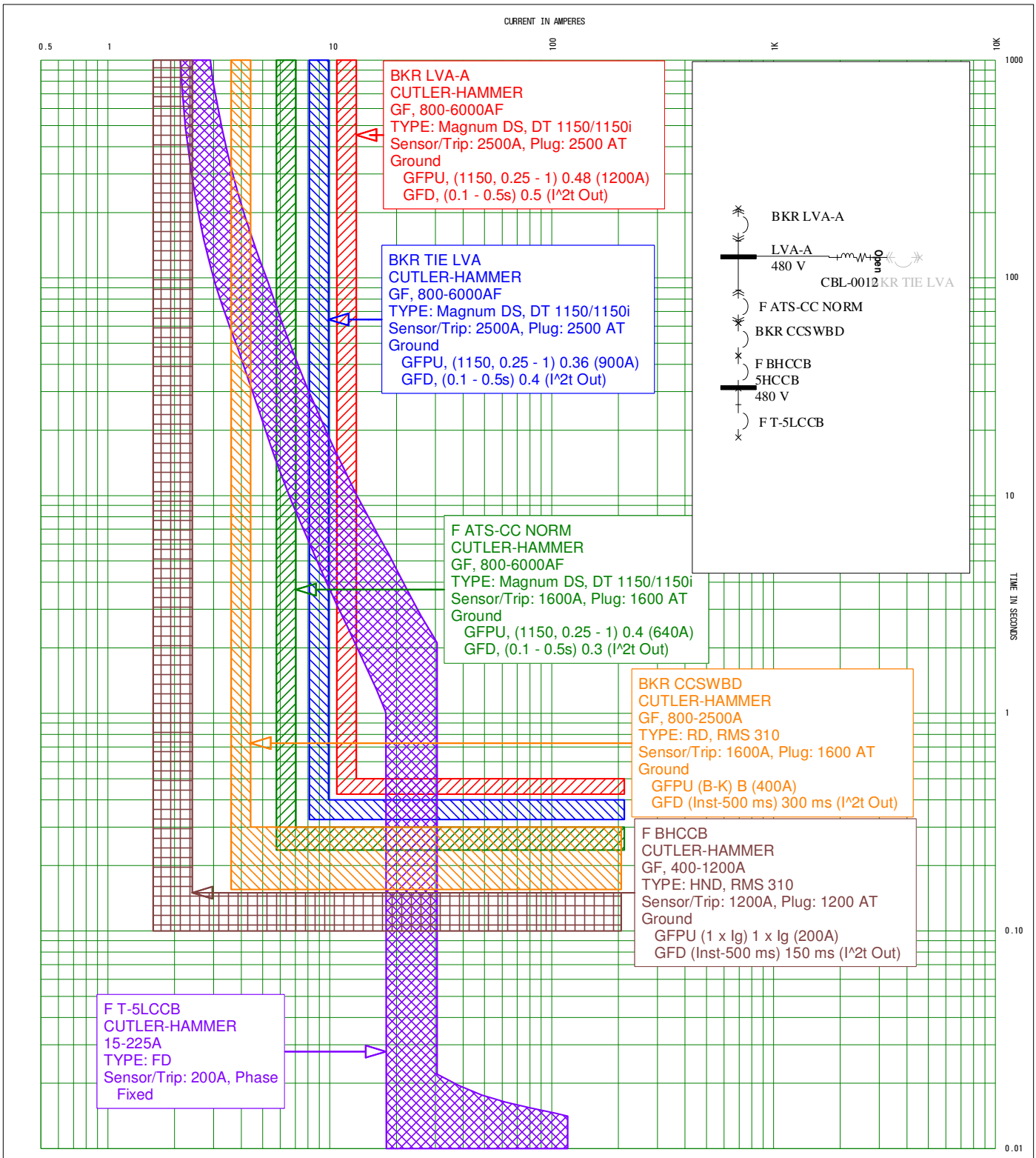

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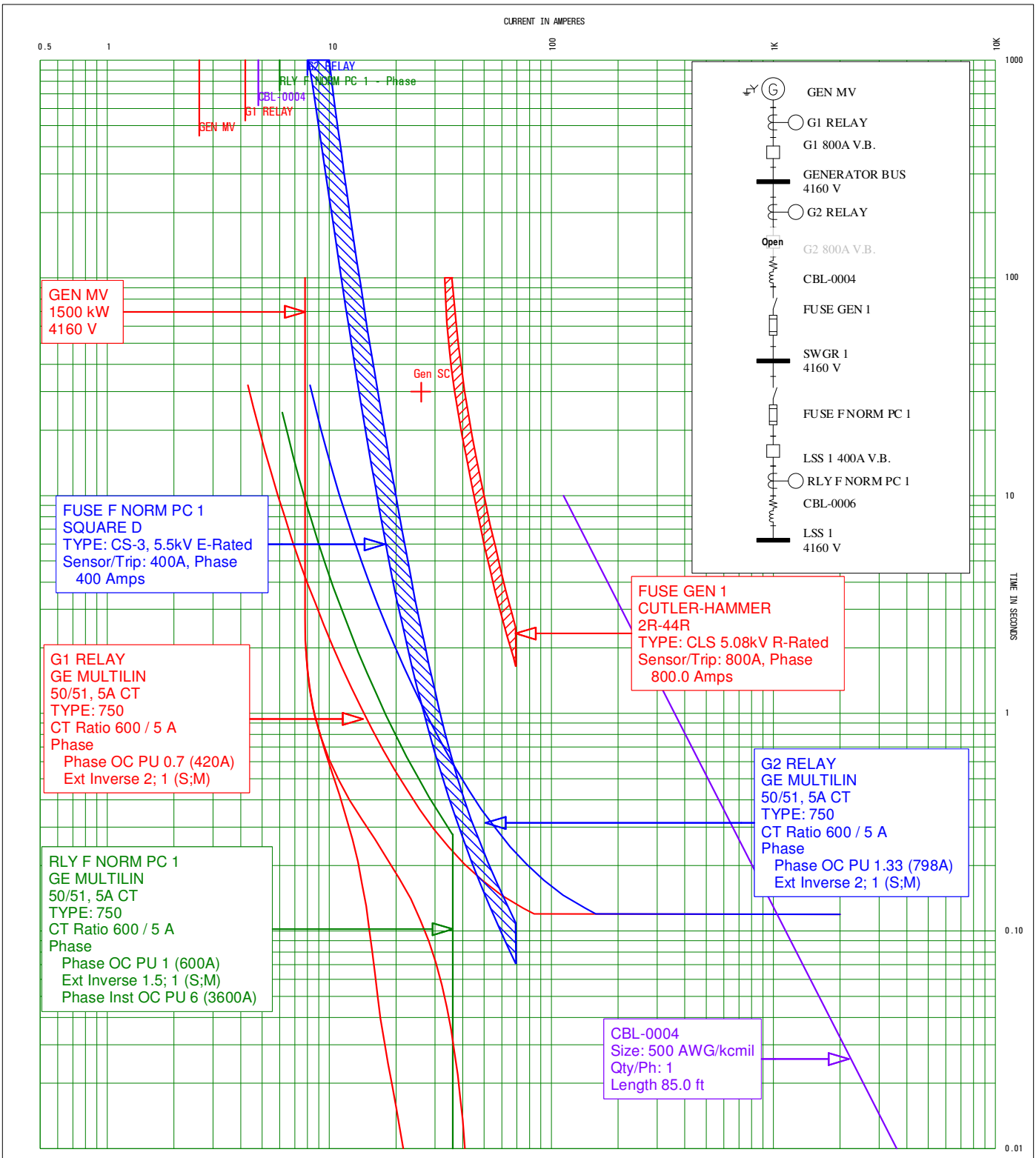

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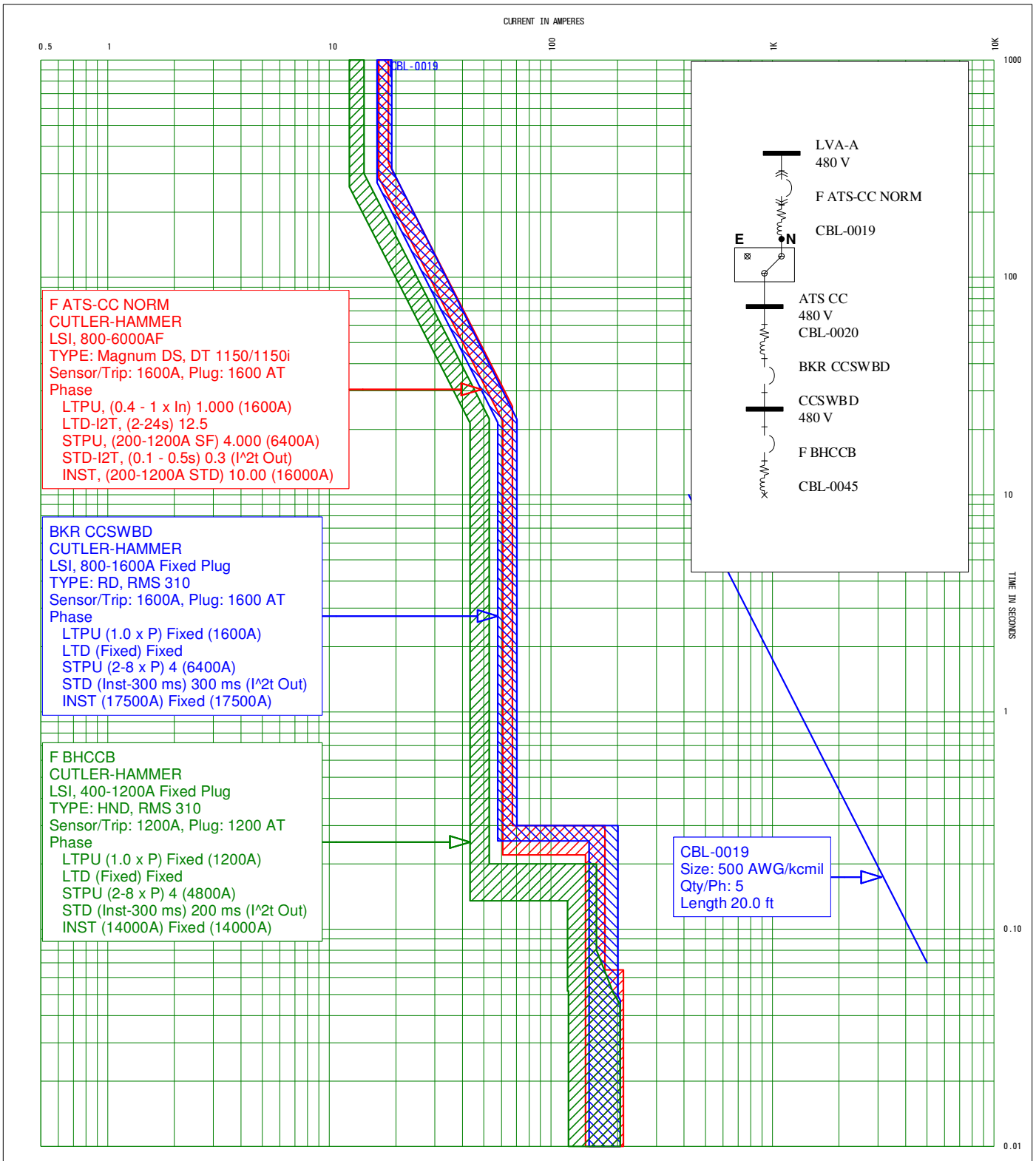
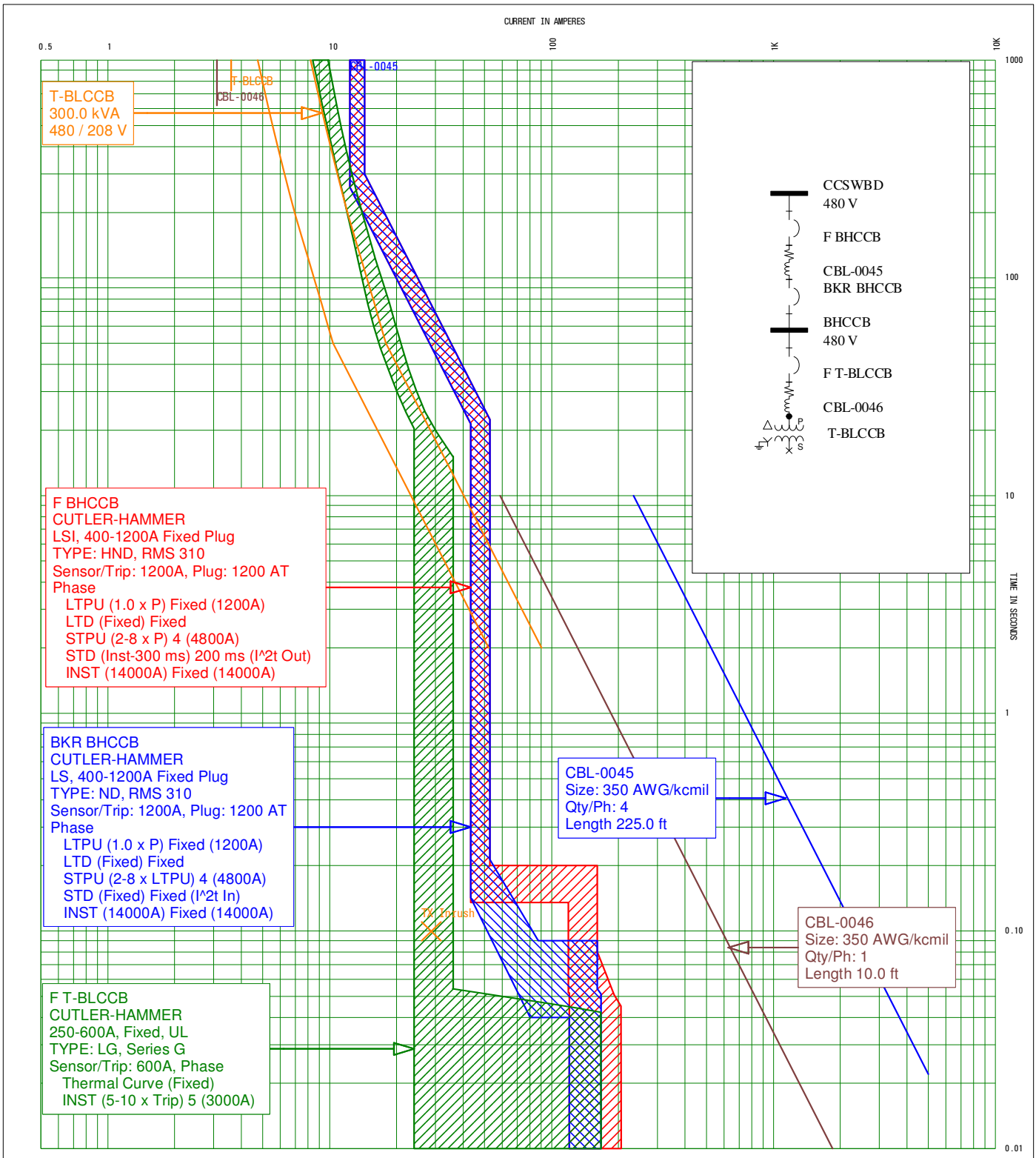
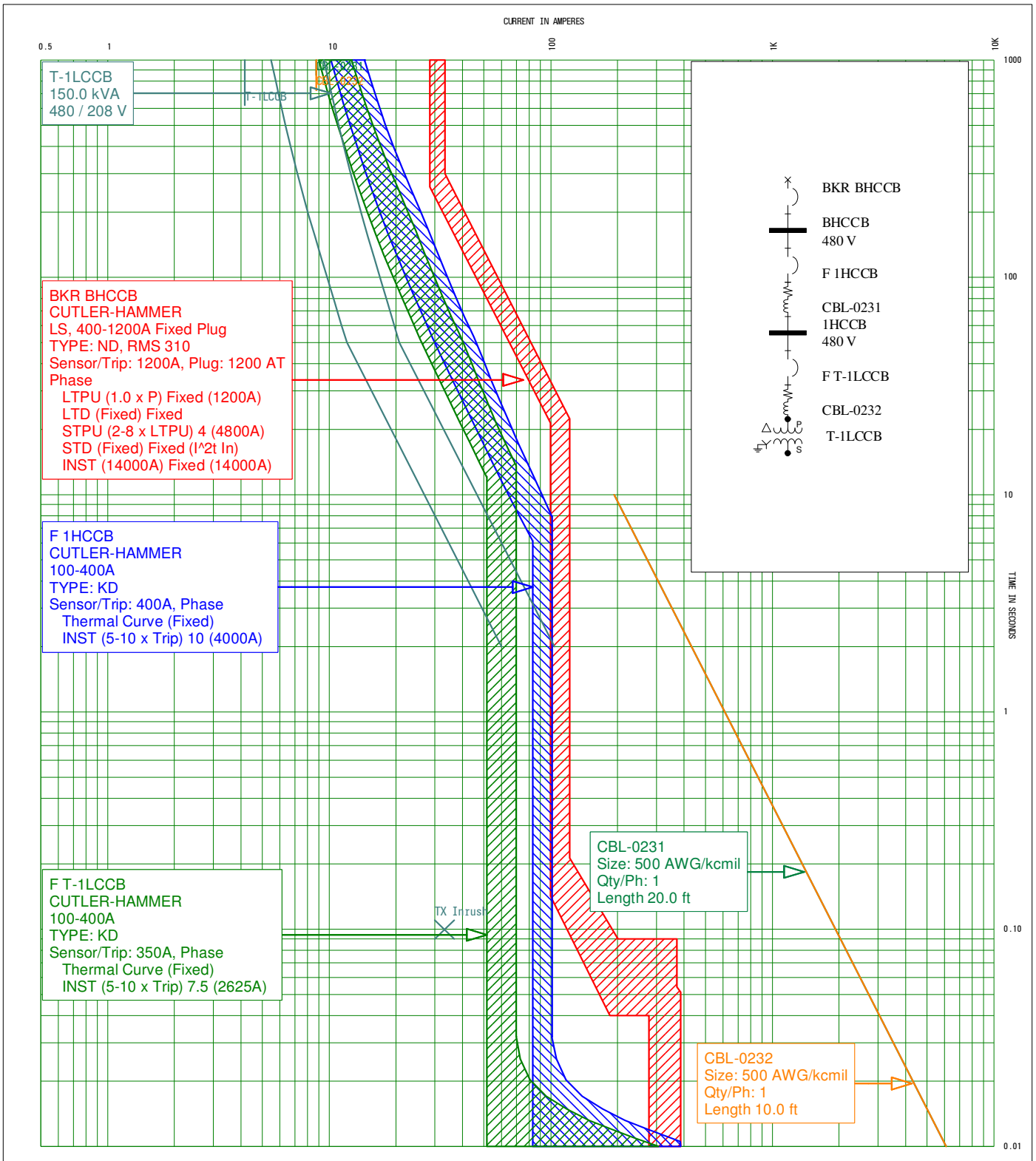


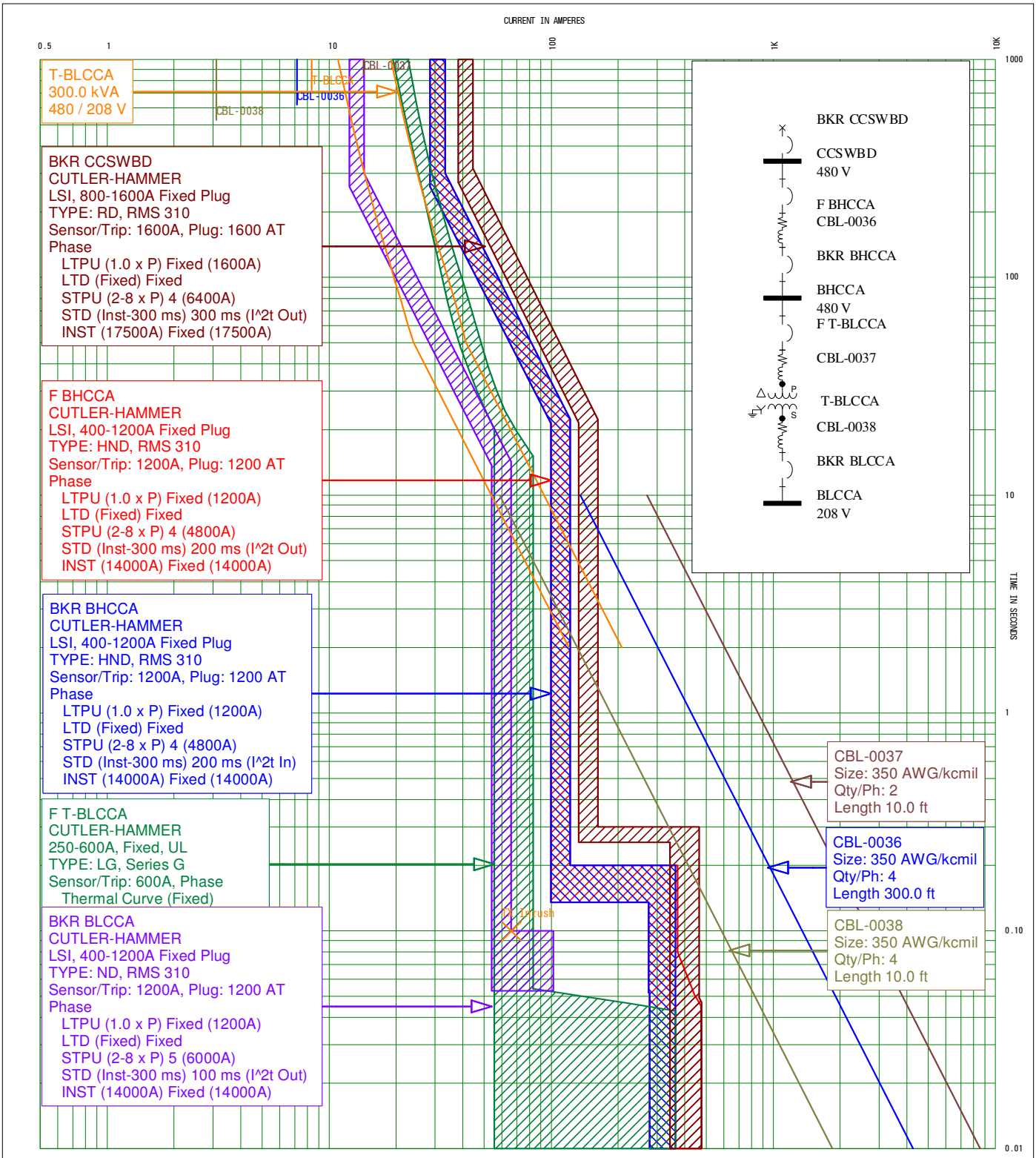
Eaton Electrical Services and Systems November 28, 2012	Plot name: 06_CCSWBD RD Ref. Voltage: 480V Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 07_BHCCB ND Ref. Voltage: 480V Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 08_BHCCB KD Ref. Voltage: 208V Current Scale: x 100



Eaton Electrical Services and Systems
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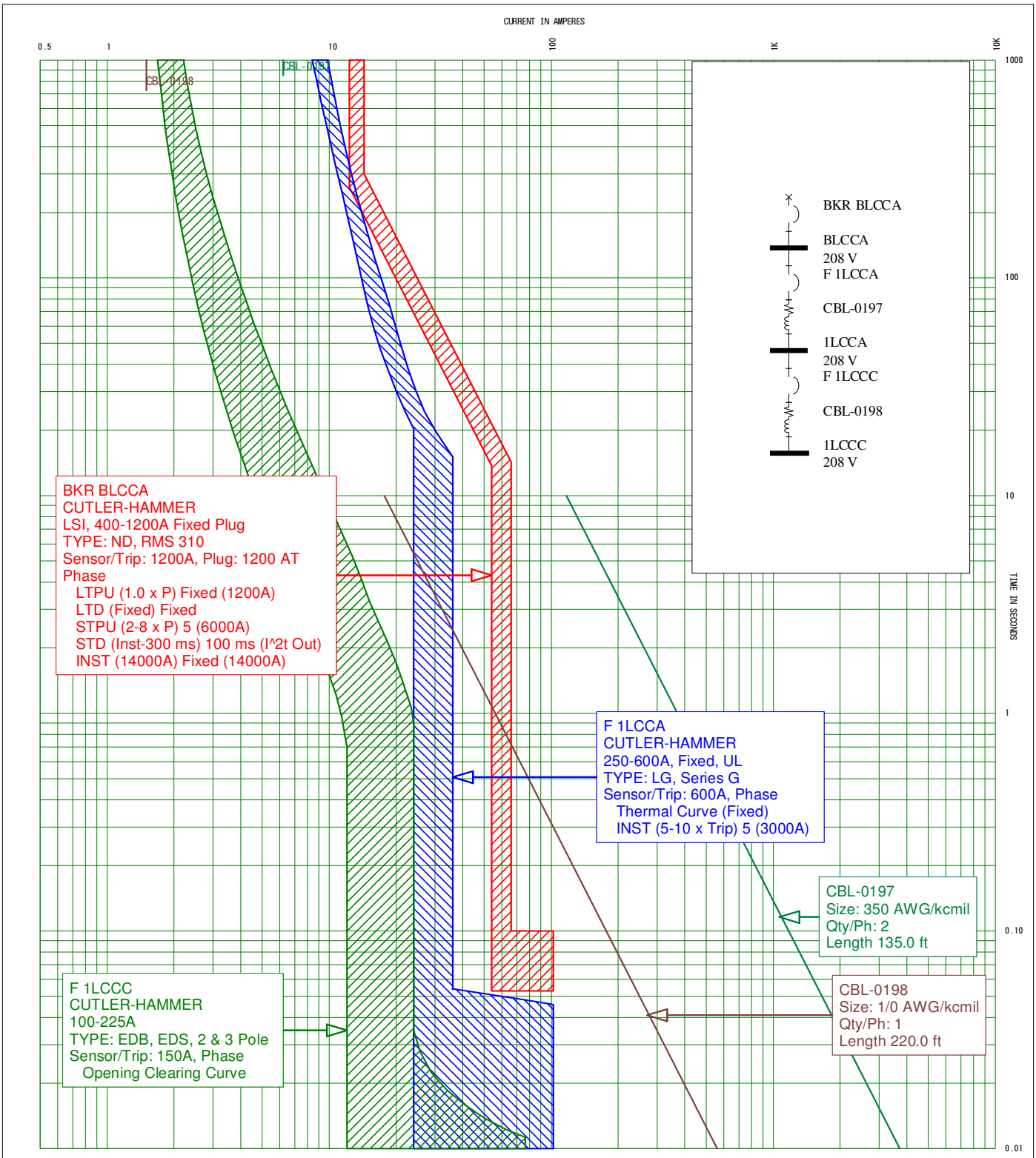
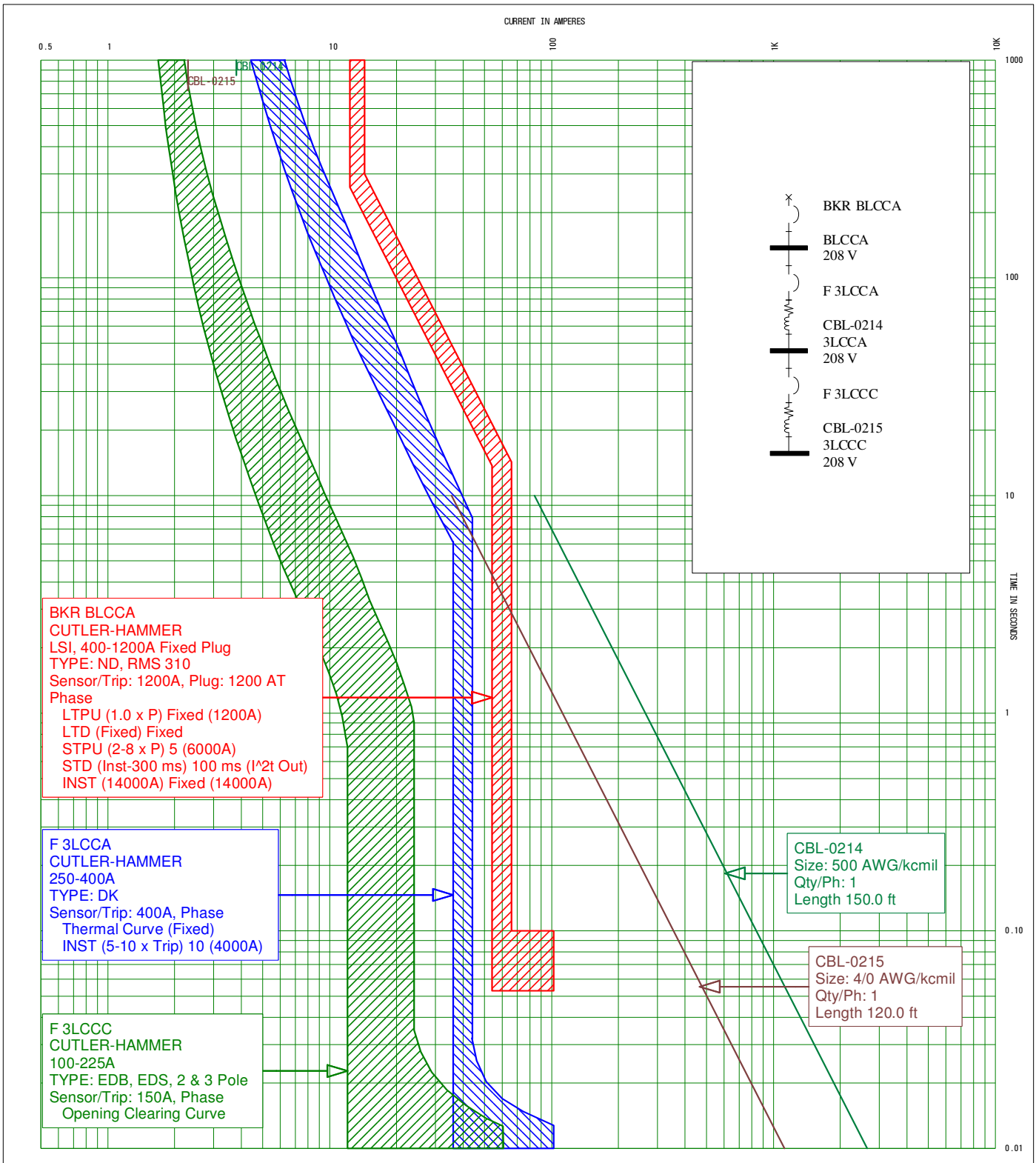
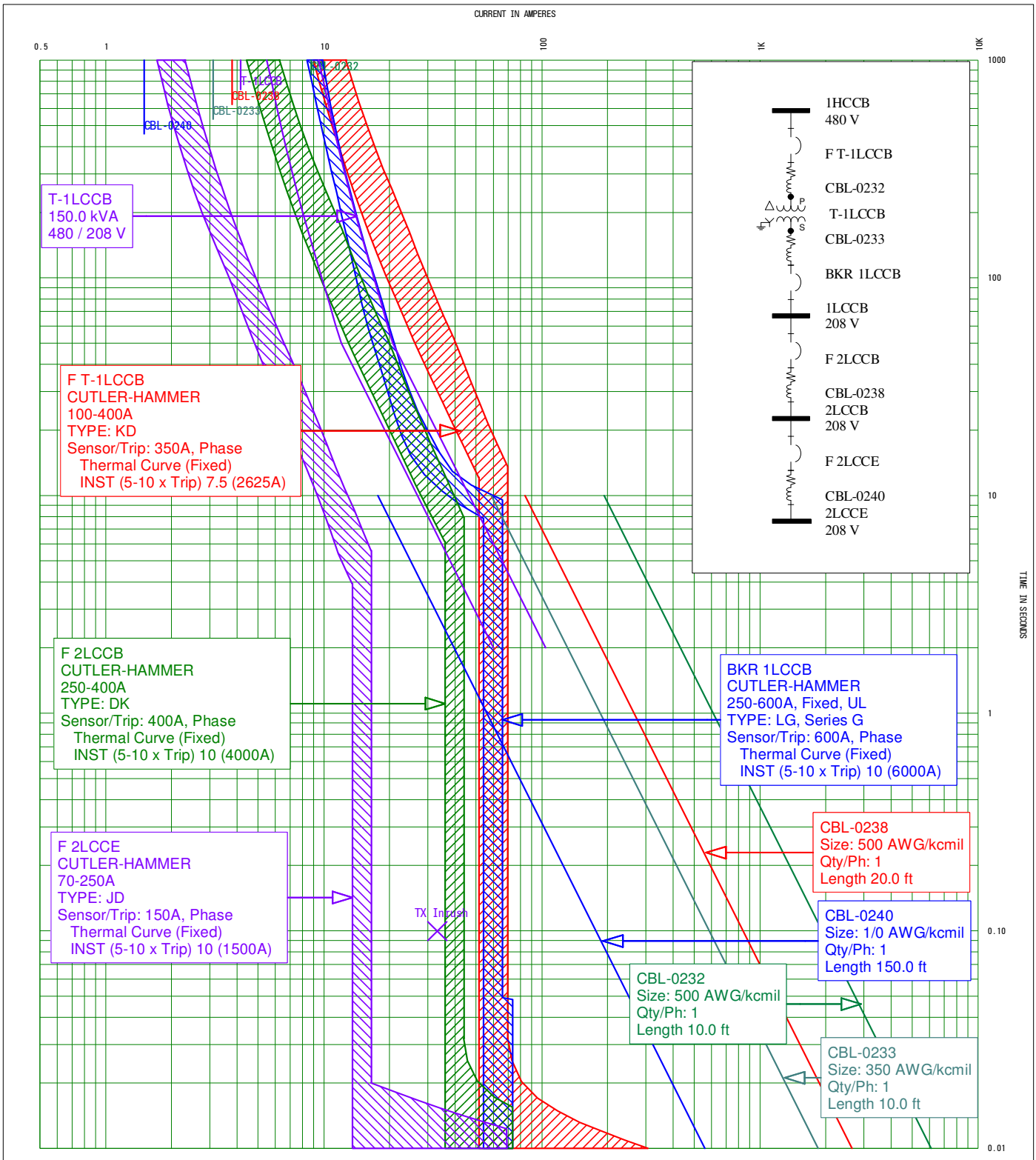
Plot name: 09_BHCCA HND
Ref. Voltage: 208V
Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 10_BLCCA LG Ref. Voltage: 208V Current Scale: x 100

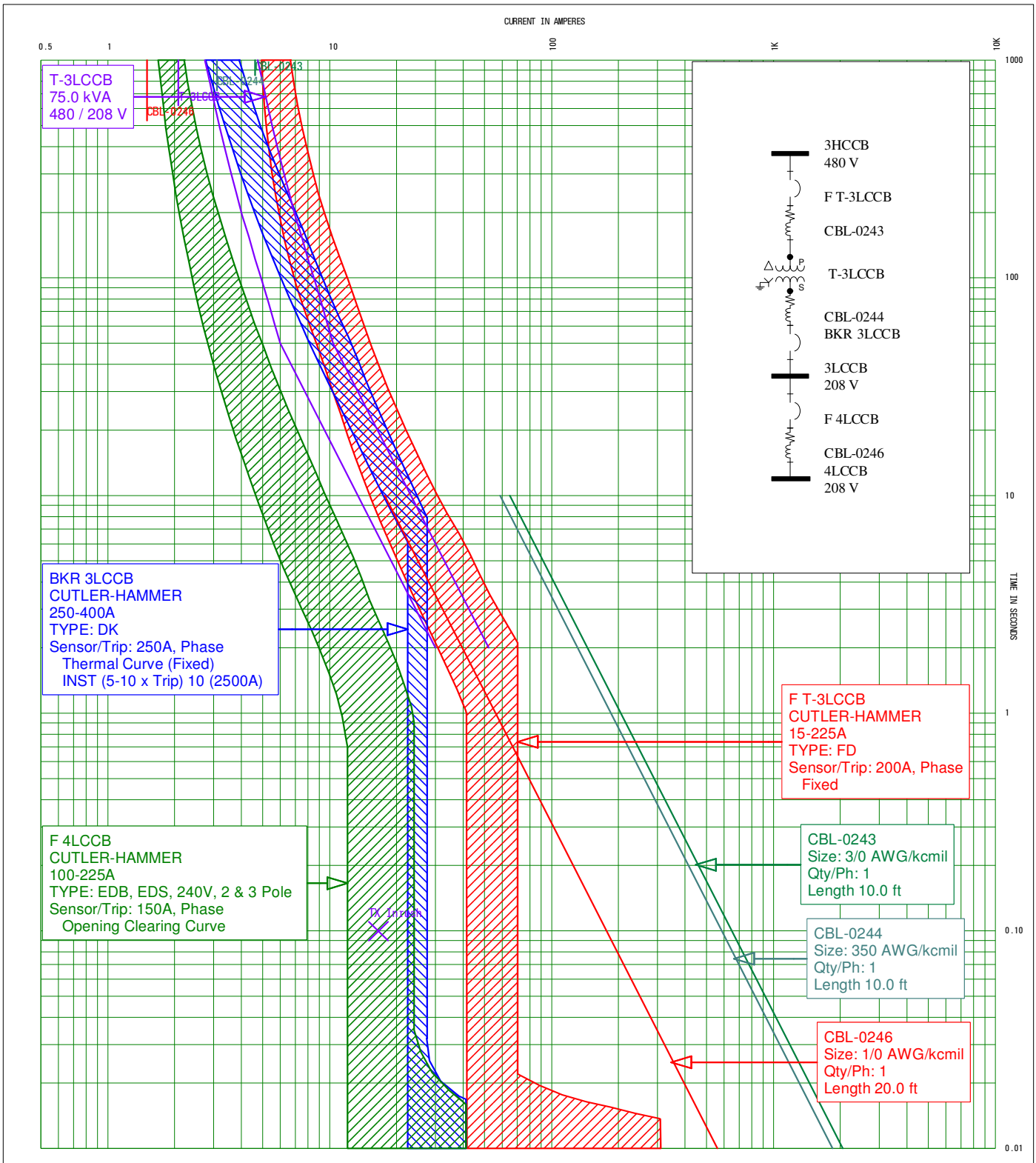


Eaton Electrical Services and Systems November 28, 2012	Plot name: 11_BLCCA DK Ref. Voltage: 208V Current Scale: x 100



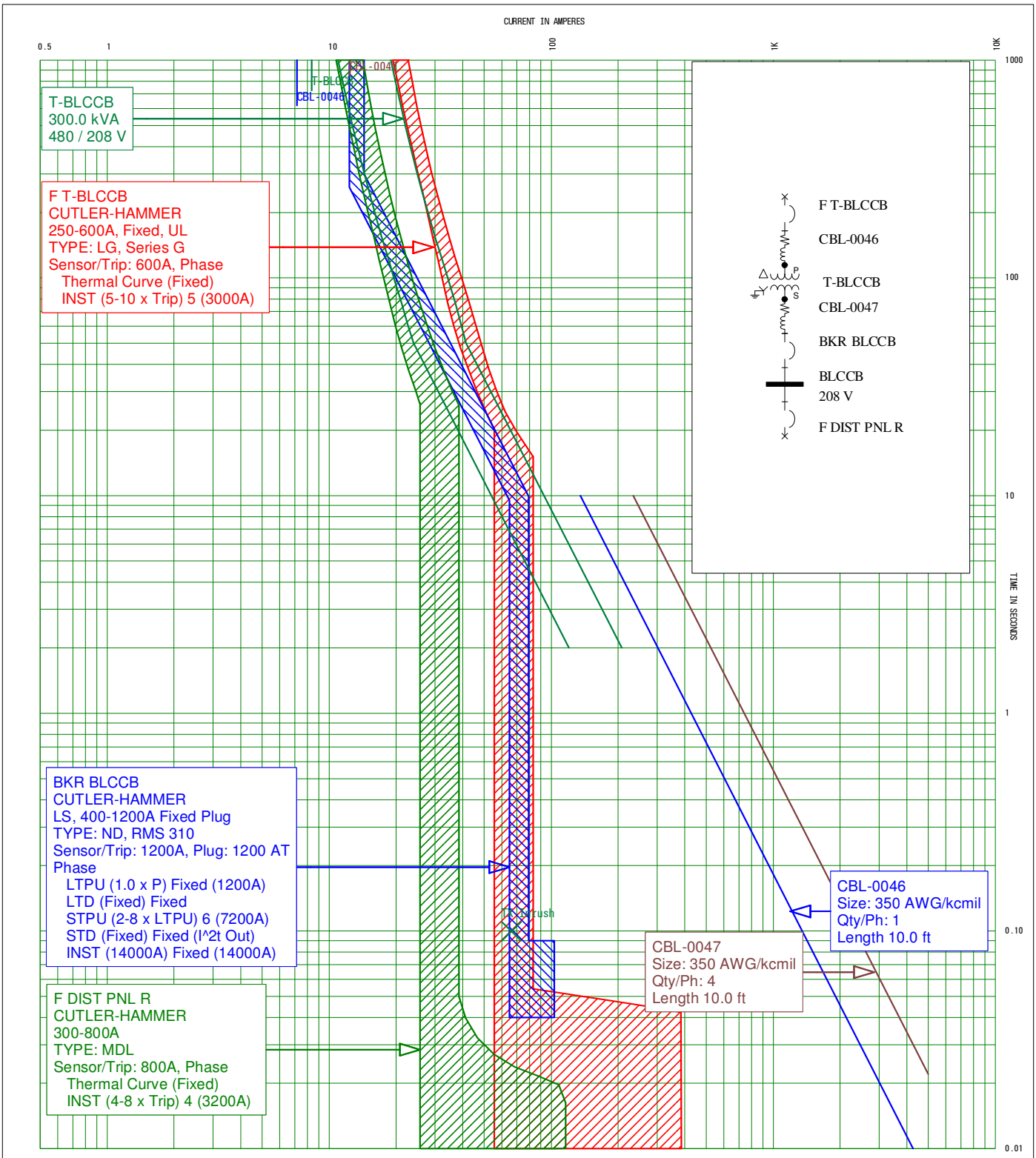
Eaton Electrical Services and Systems
November 28, 2012

Plot name: 12_1LCCB LG
Ref. Voltage: 208V
Current Scale: x 100



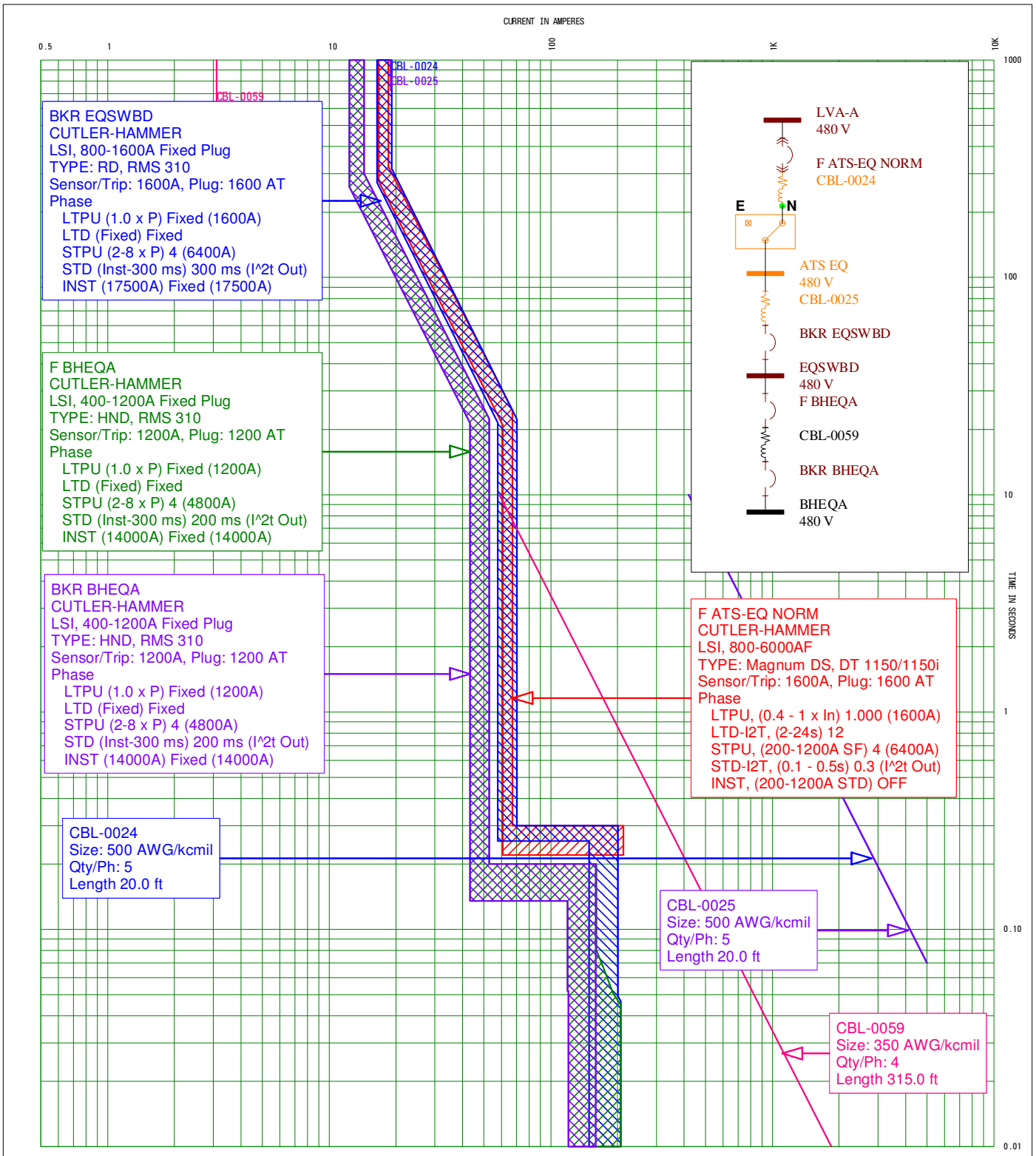
Eaton Electrical Services and Systems
November 28, 2012

Plot name: 13_3LCCB DK
Ref. Voltage: 208V
Current Scale: x 100

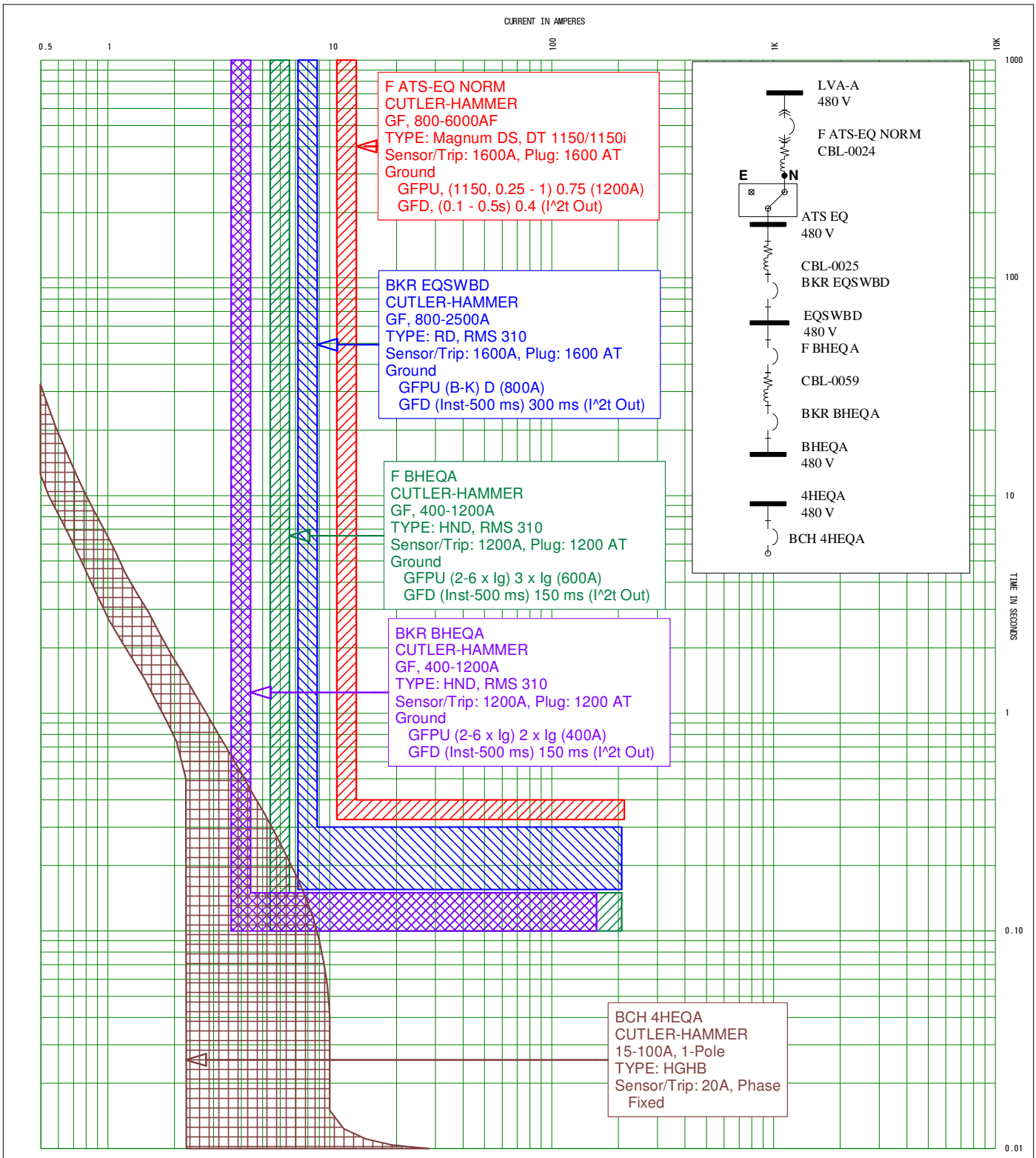


Eaton Electrical Services and Systems
November 28, 2012

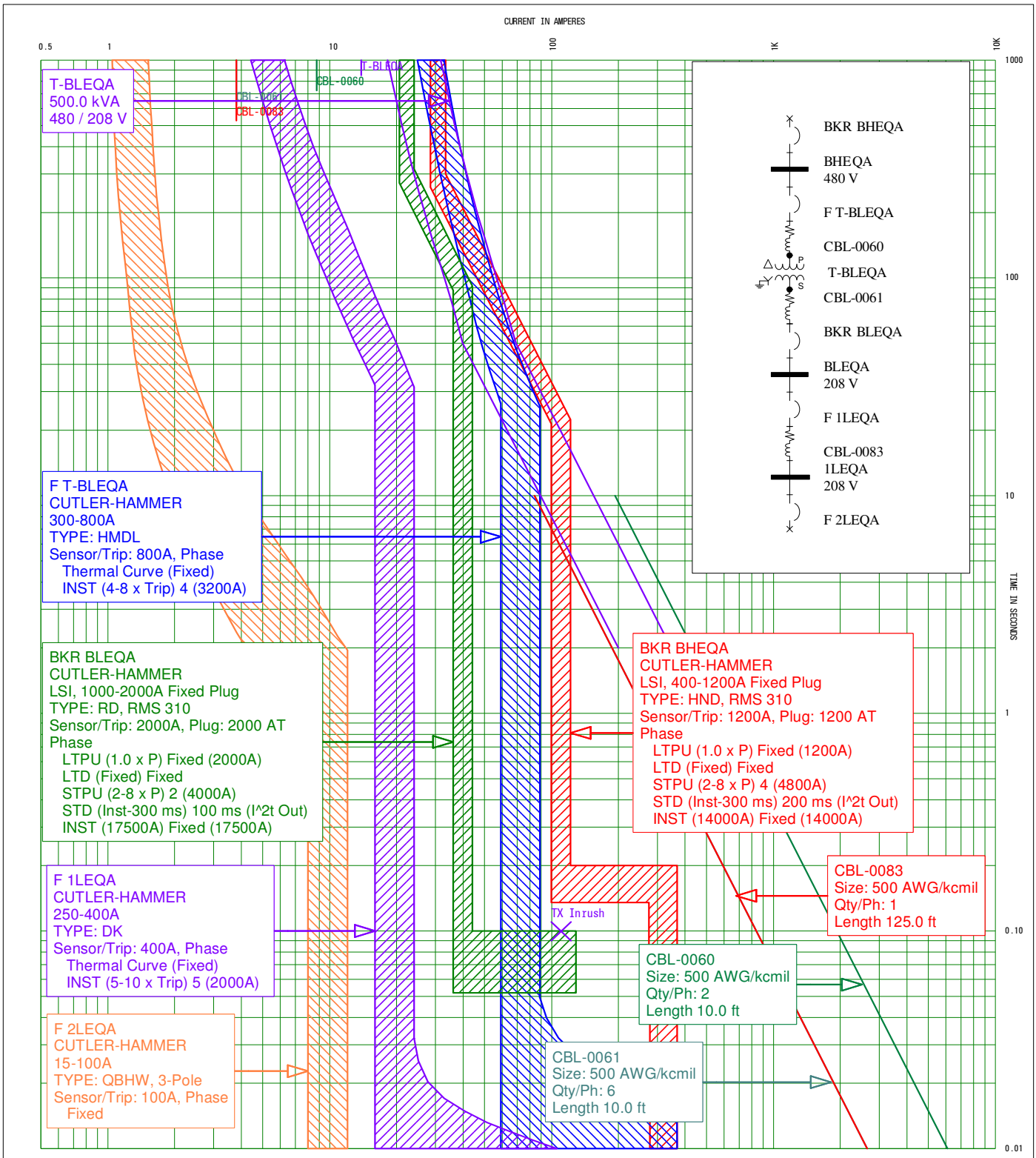
Plot name: 14_BLCCB ND
Ref. Voltage: 208V
Current Scale: x 100



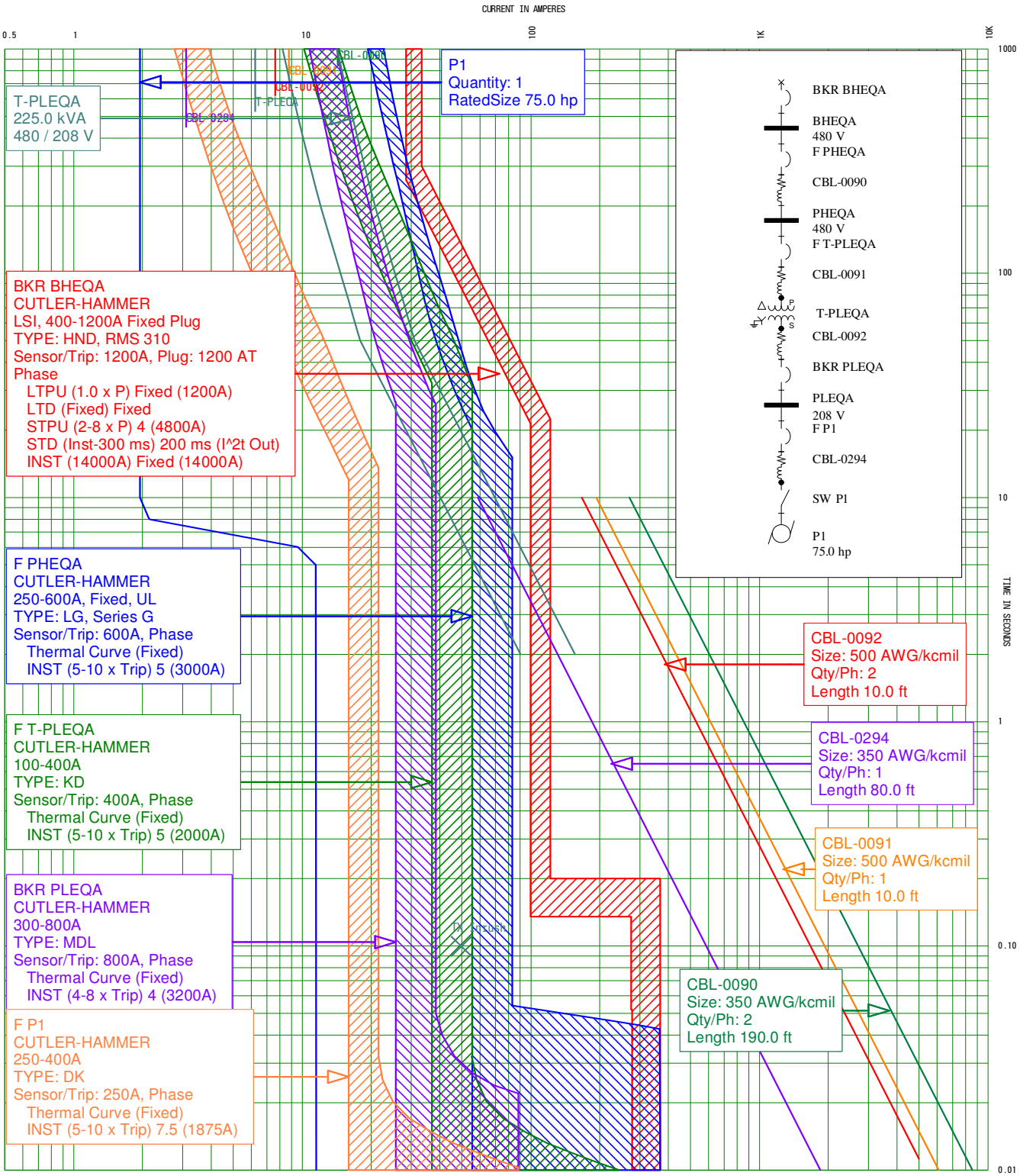
Eaton Electrical Services and Systems November 28, 2012	Plot name: 15_EQSWBD RD Ref. Voltage: 480V Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 16_EQSWBD RD Gnd Ref. Voltage: 480V Current Scale: x 100

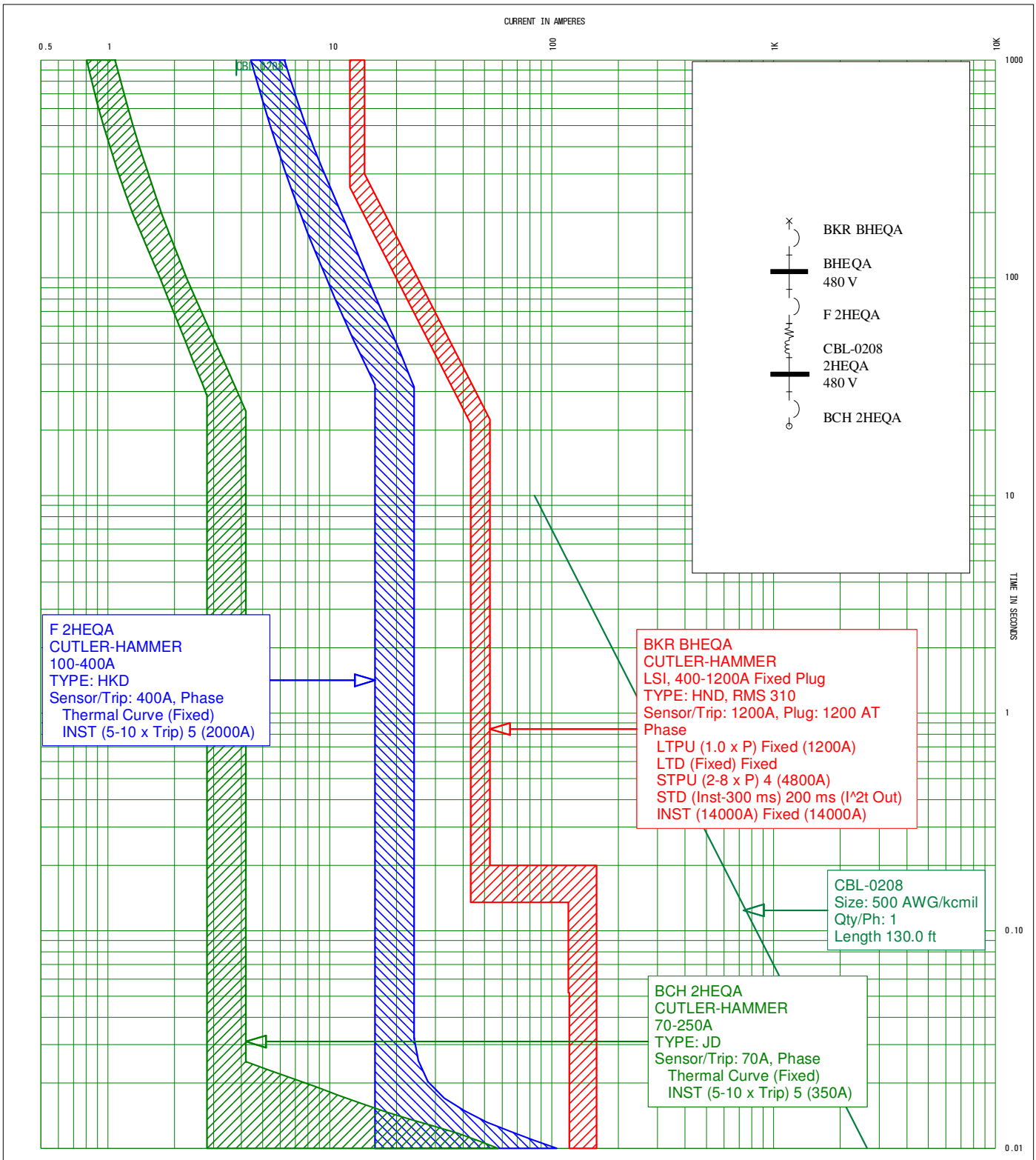


Eaton Electrical Services and Systems November 28, 2012	Plot name: 17_BHEQA HMDL Ref. Voltage: 208V Current Scale: x 100

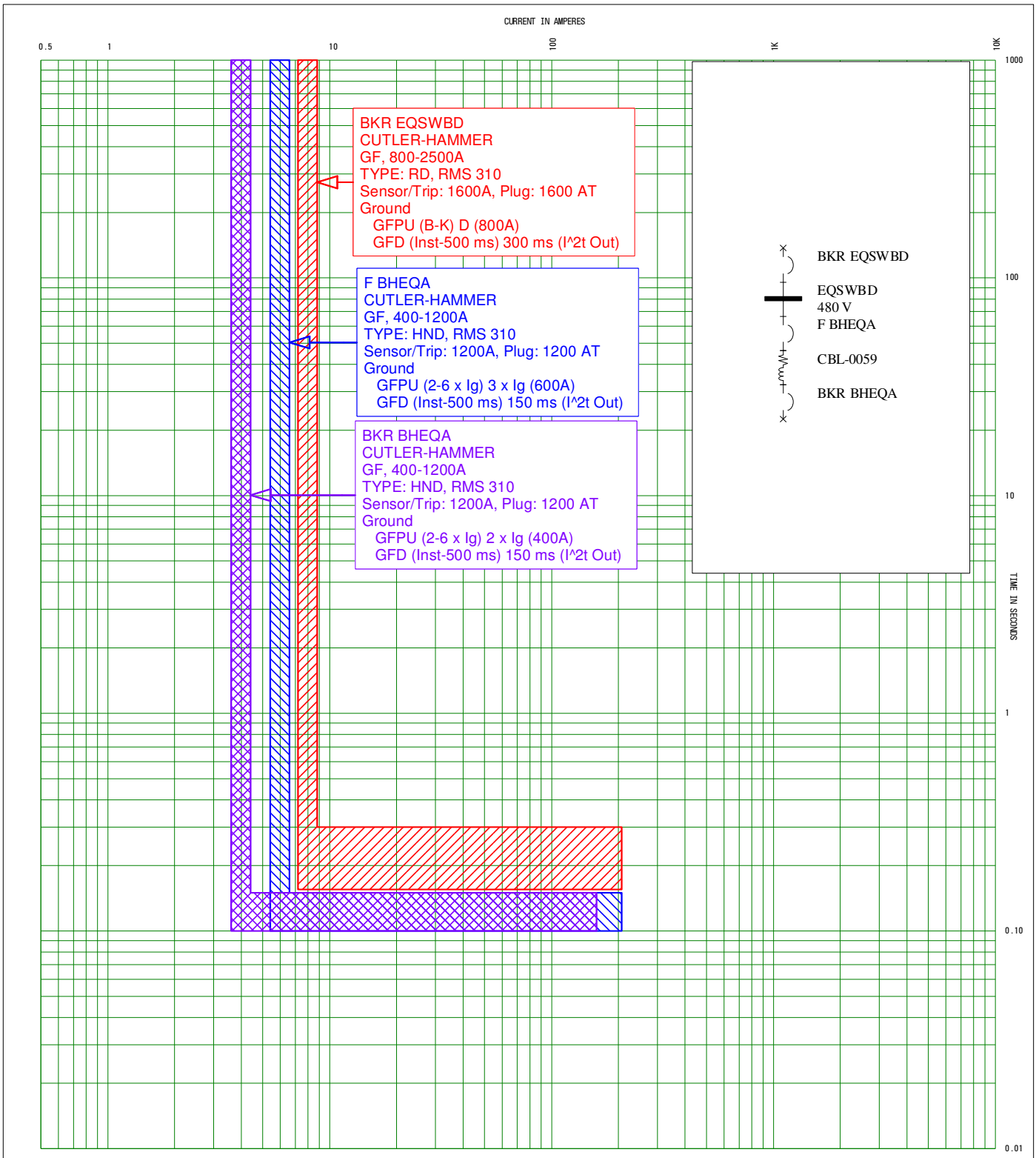


Eaton Electrical Services and Systems
November 28, 2012

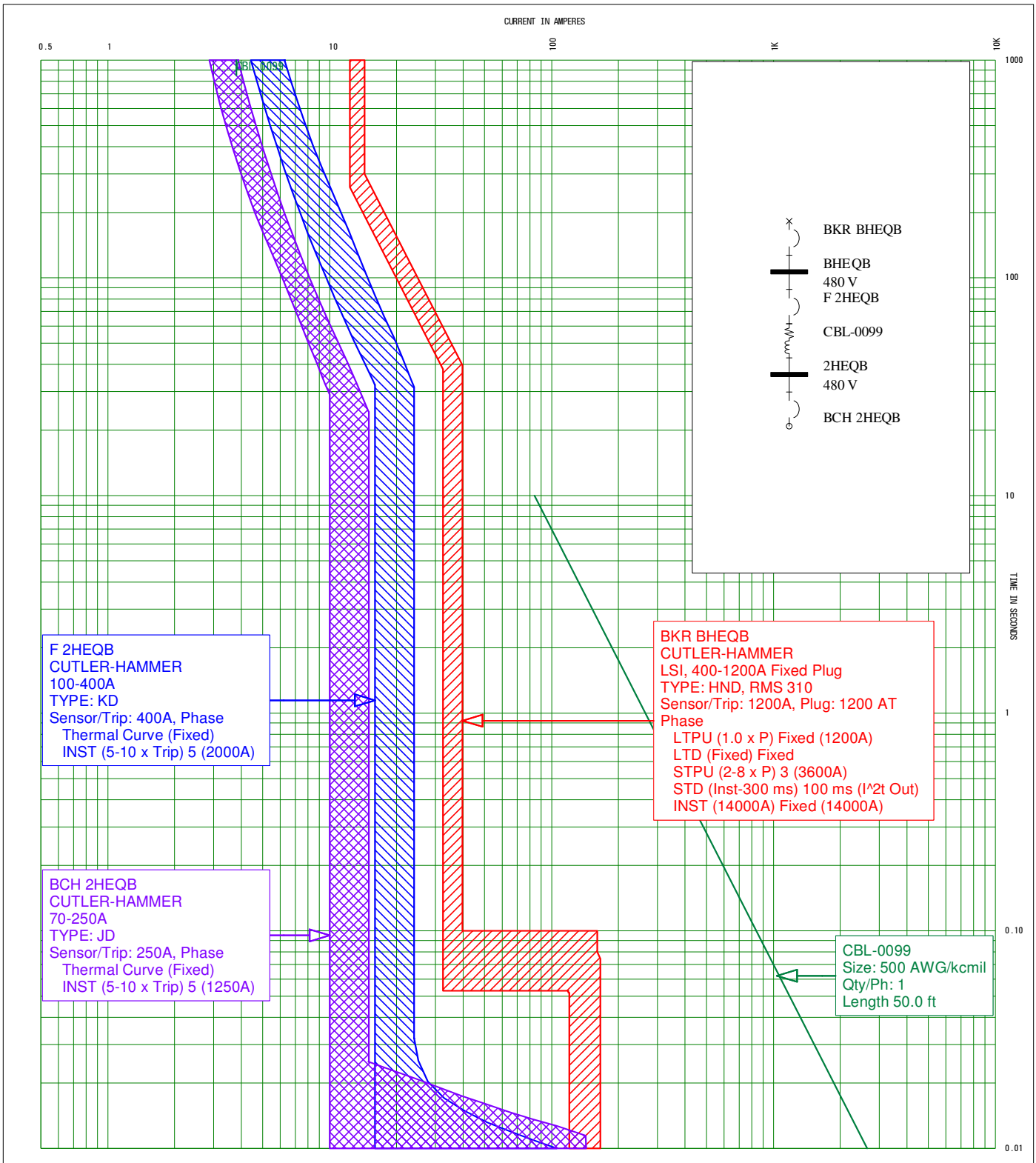
Plot name: 18_BHEQA LG
Ref. Voltage: 208V
Current Scale: x 100



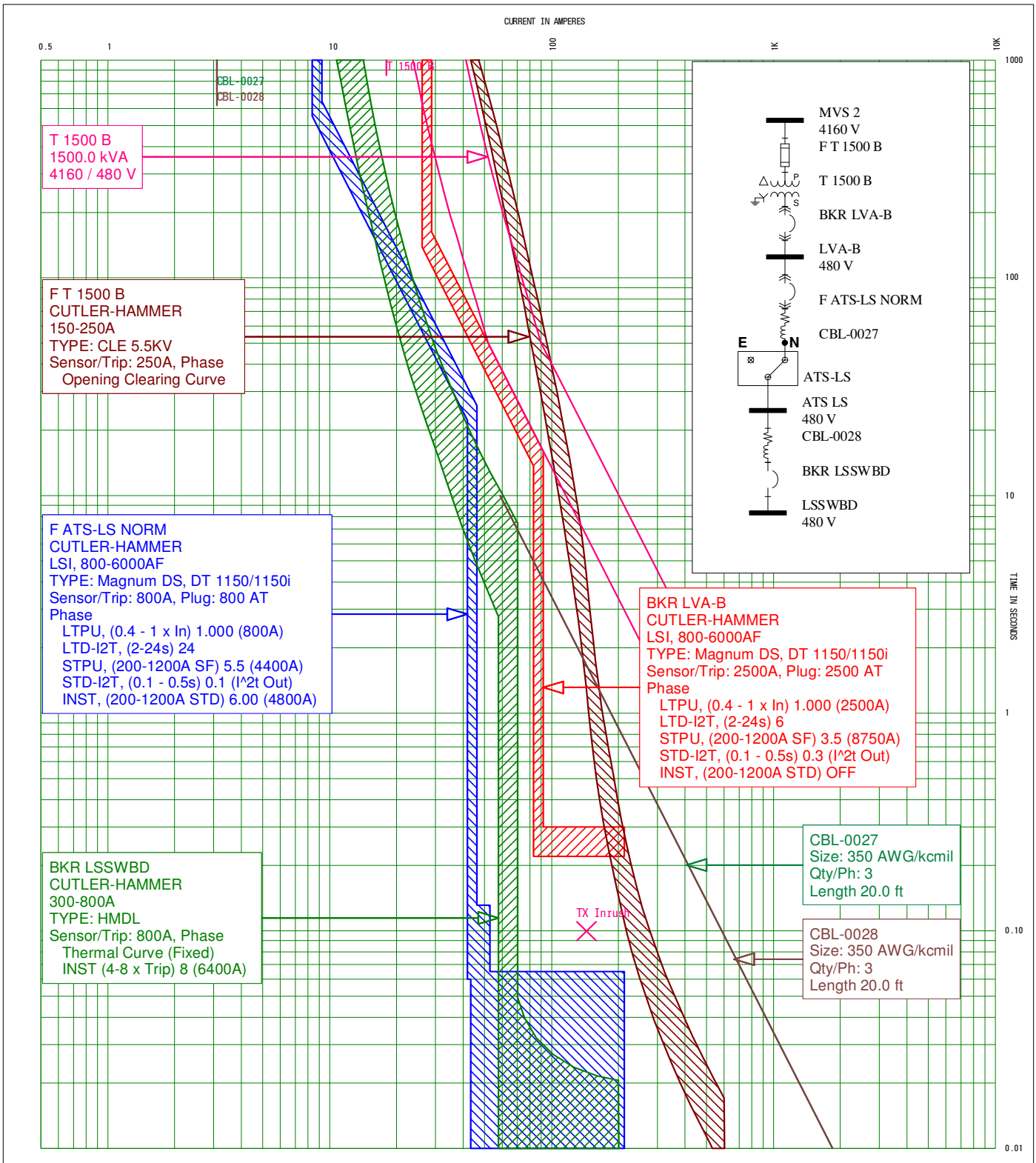
Eaton Electrical Services and Systems November 28, 2012	Plot name: 19_BHEQA HKD Ref. Voltage: 480V Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 20_BHEQA Gnd Ref. Voltage: 480V Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 21_BHEQB KD Ref. Voltage: 480V Current Scale: x 100



Eaton Electrical Services and Systems
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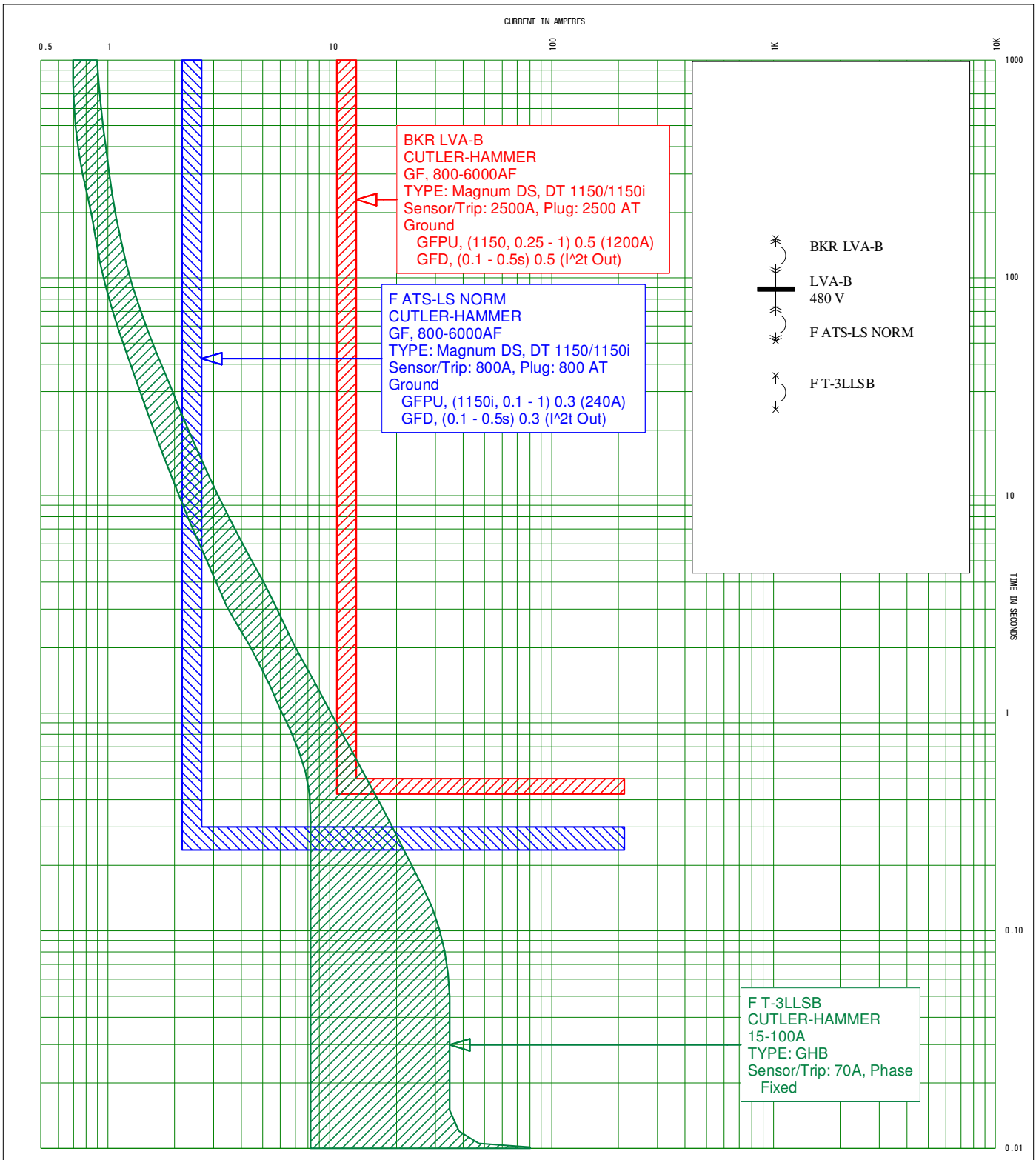
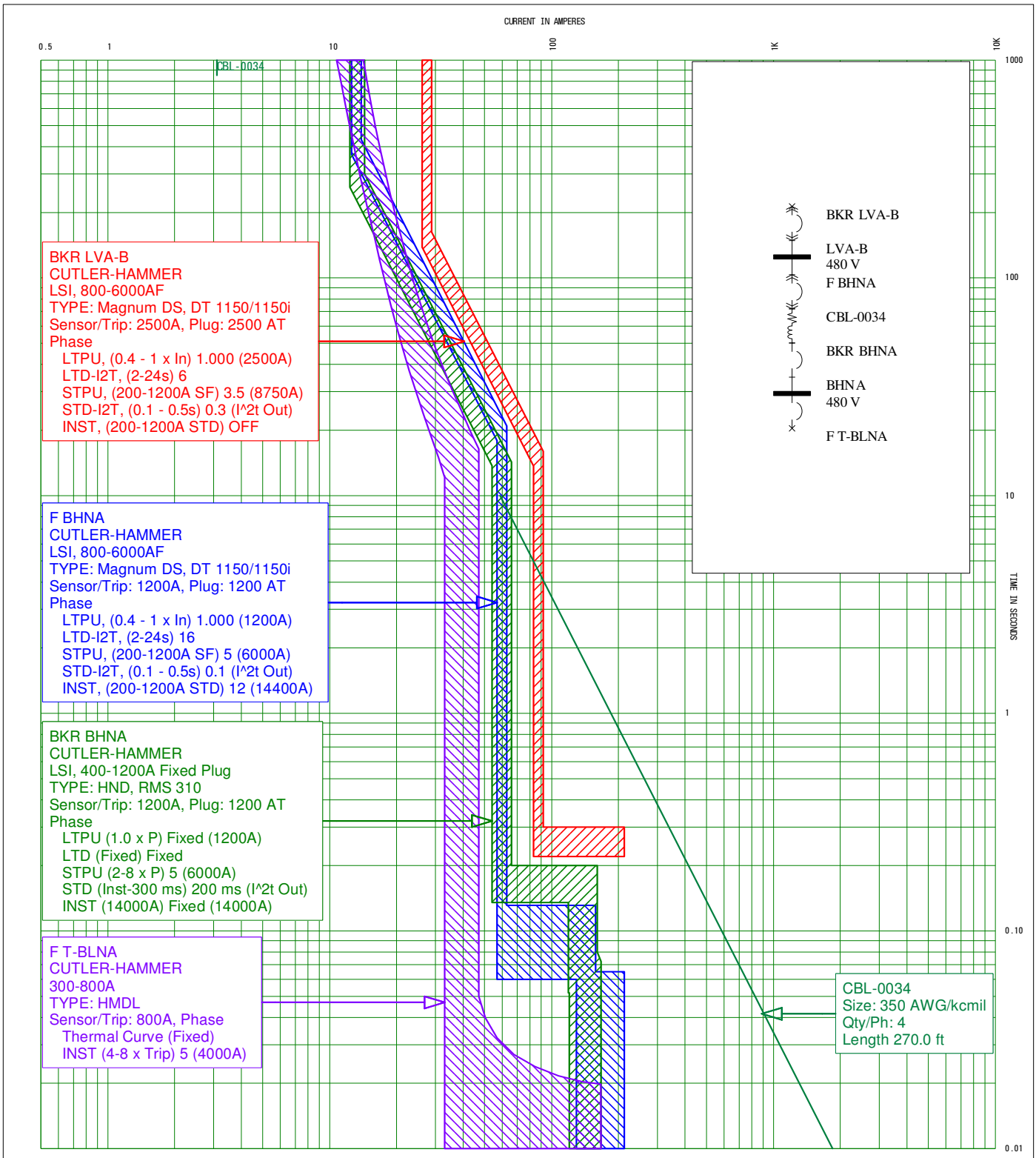
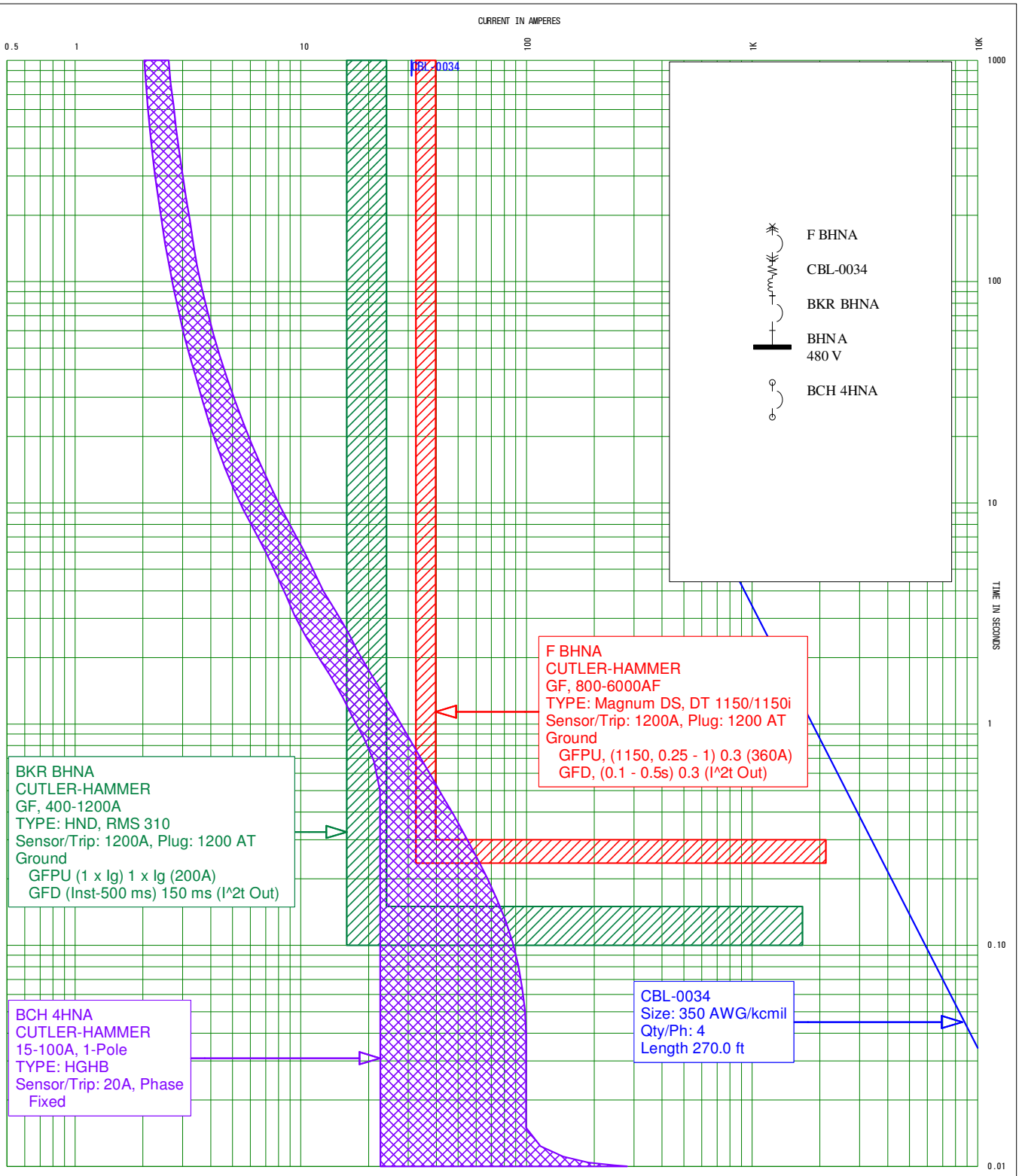
Plot name: 22_LVB Mag 800A ATS_LS
Ref. Voltage: 480V
Current Scale: x 100



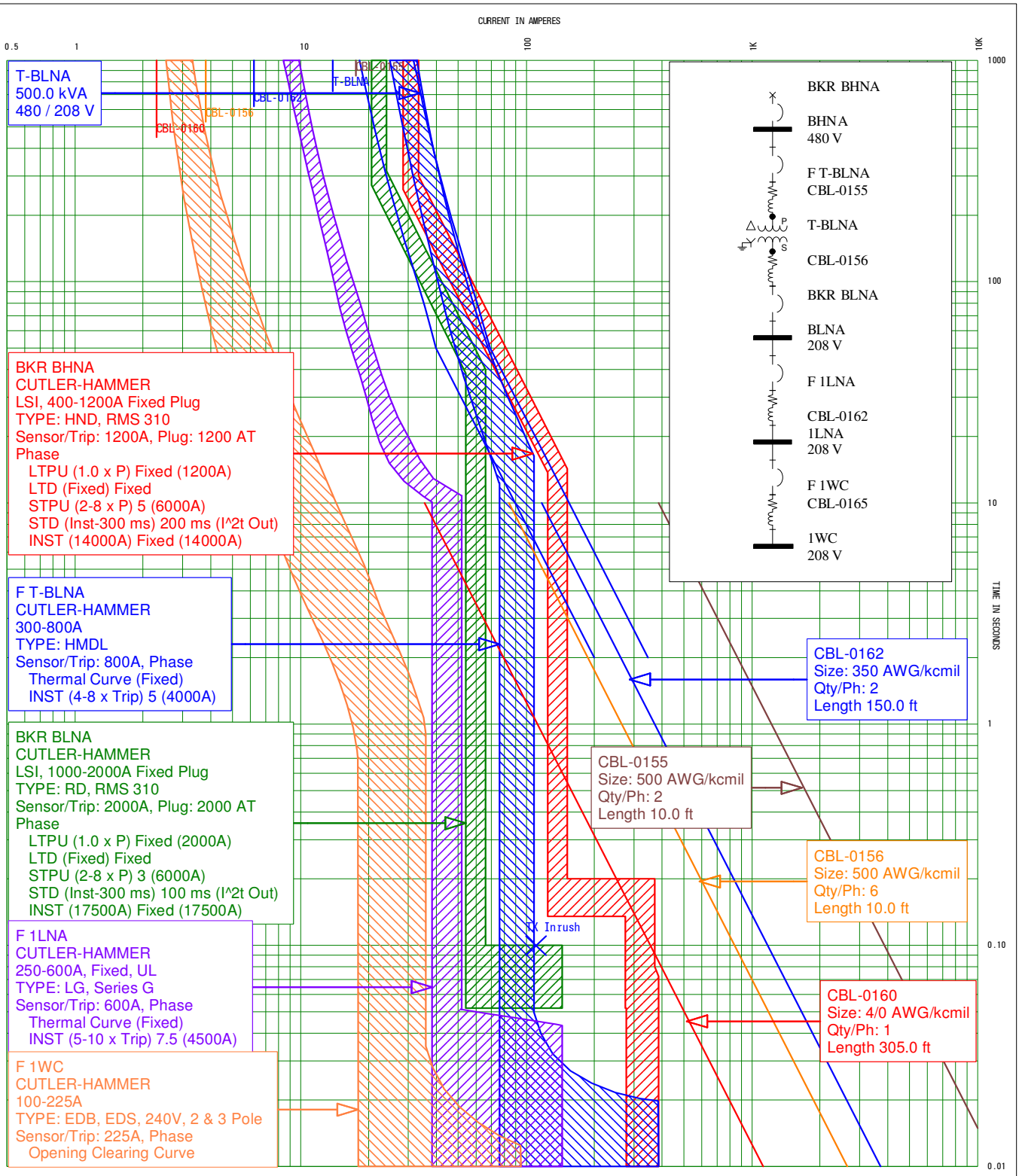
Eaton Electrical Services and Systems November 28, 2012	Plot name: 23_LVB Mag 800A ATS_LS Gnd Ref. Voltage: 480V Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 24_LVB Mag 800A F BHNA Ref. Voltage: 480V Current Scale: x 100

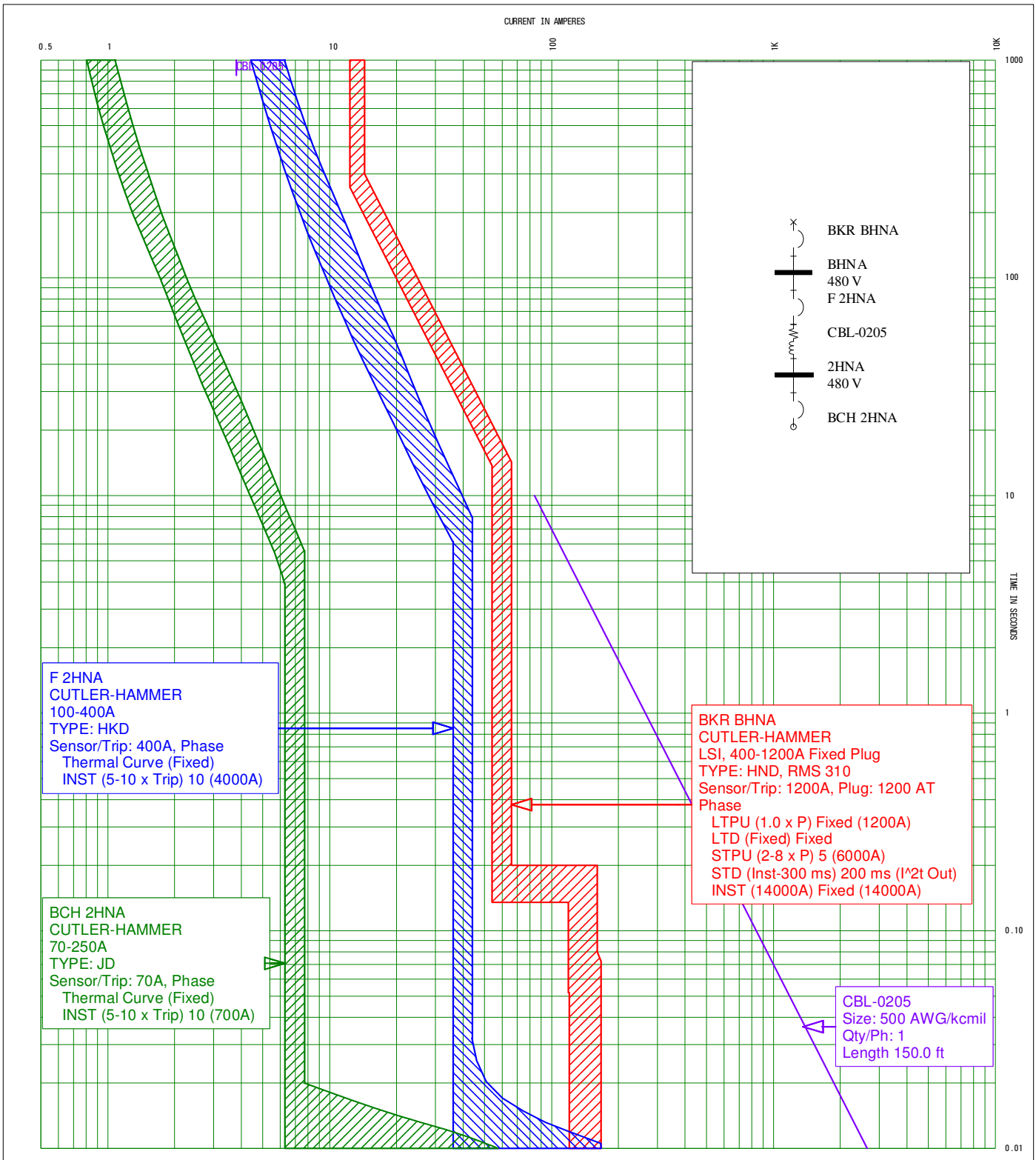


Eaton Electrical Services and Systems November 28, 2012	Plot name: 25_LVB Mag 800A F BHNA Gnd Ref. Voltage: 480V Current Scale: x 10

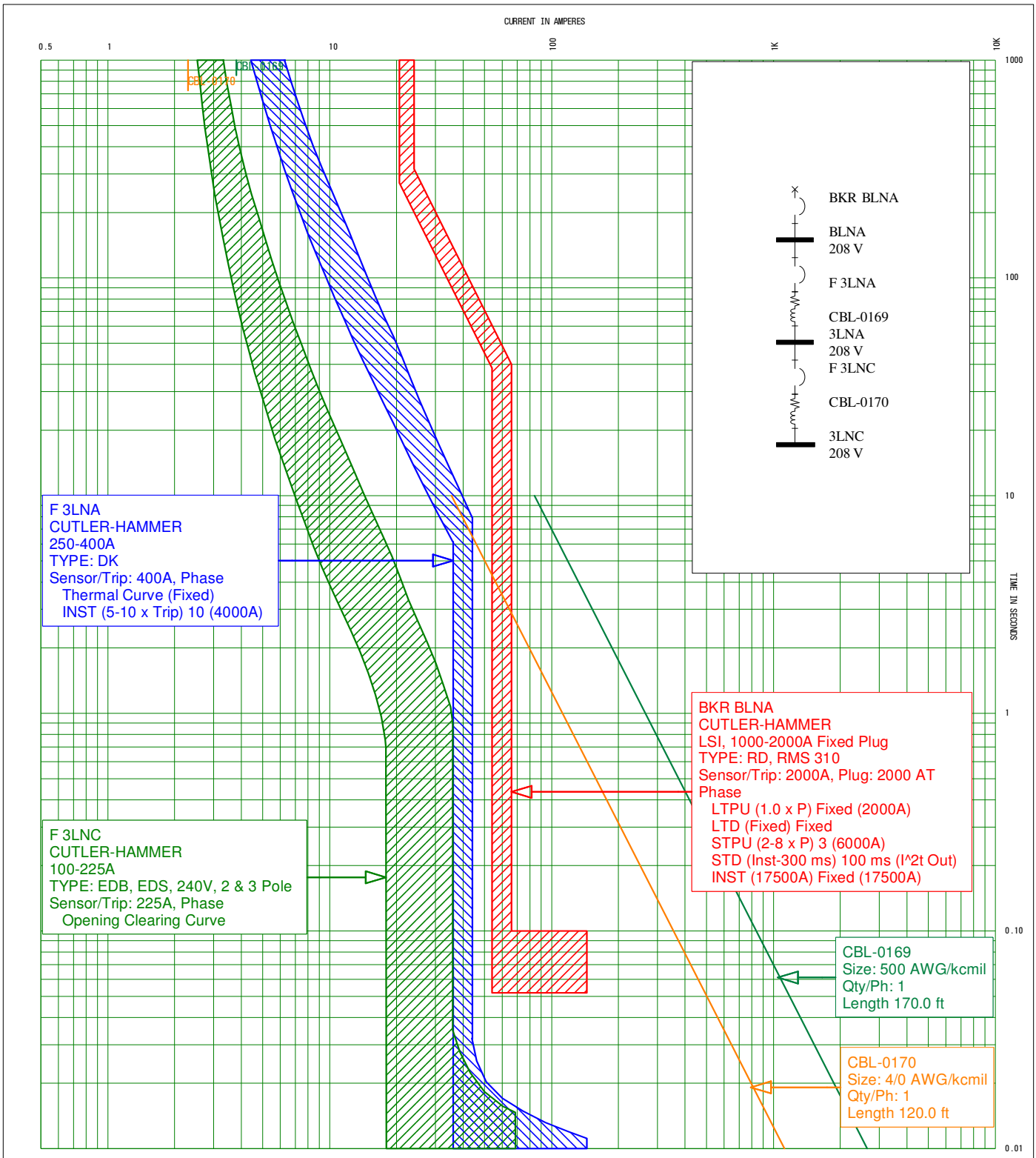


Eaton Electrical Services and Systems
November 28, 2012

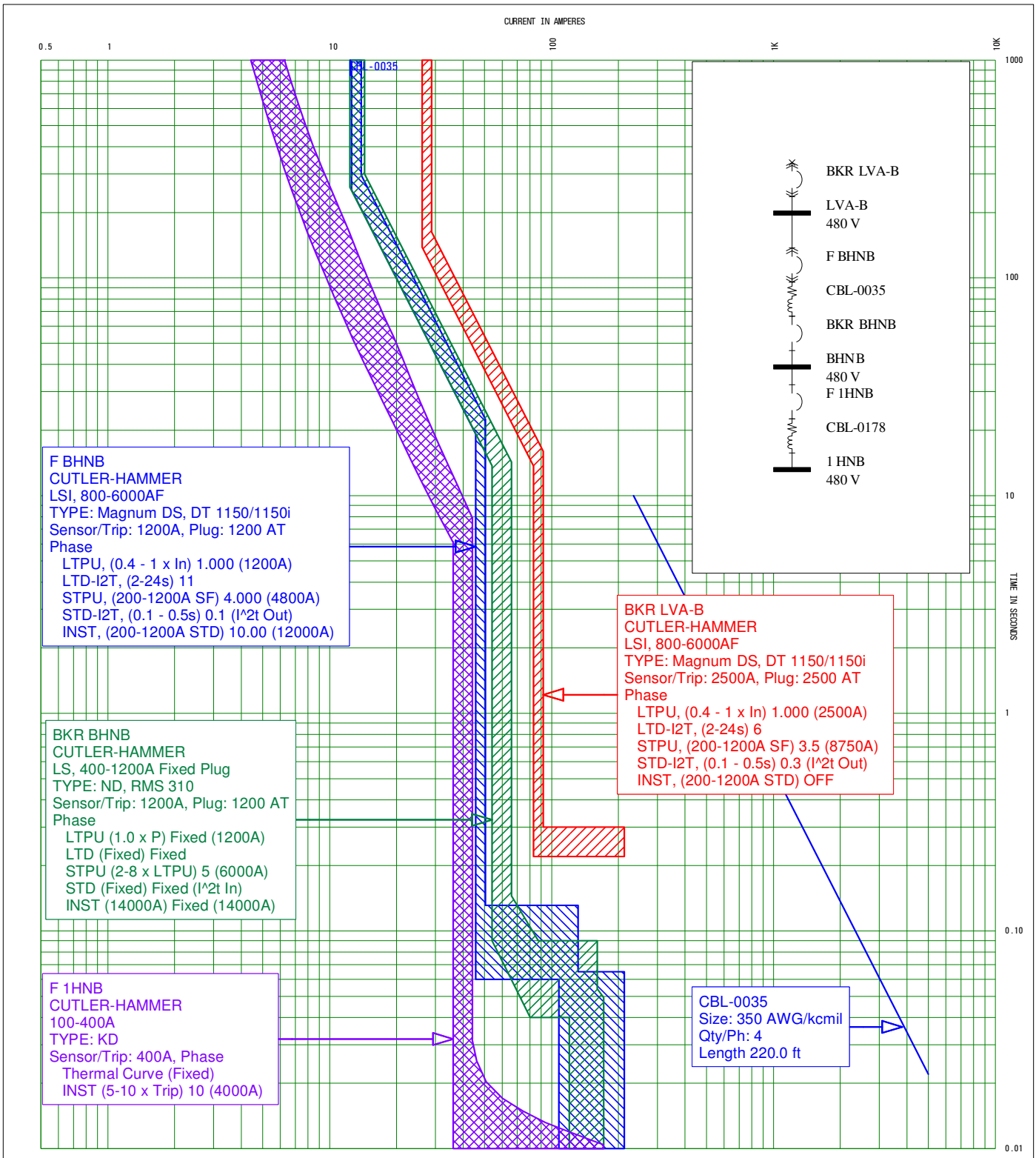
Plot name: 26_BHNA HMDL
Ref. Voltage: 208V
Current Scale: x 100



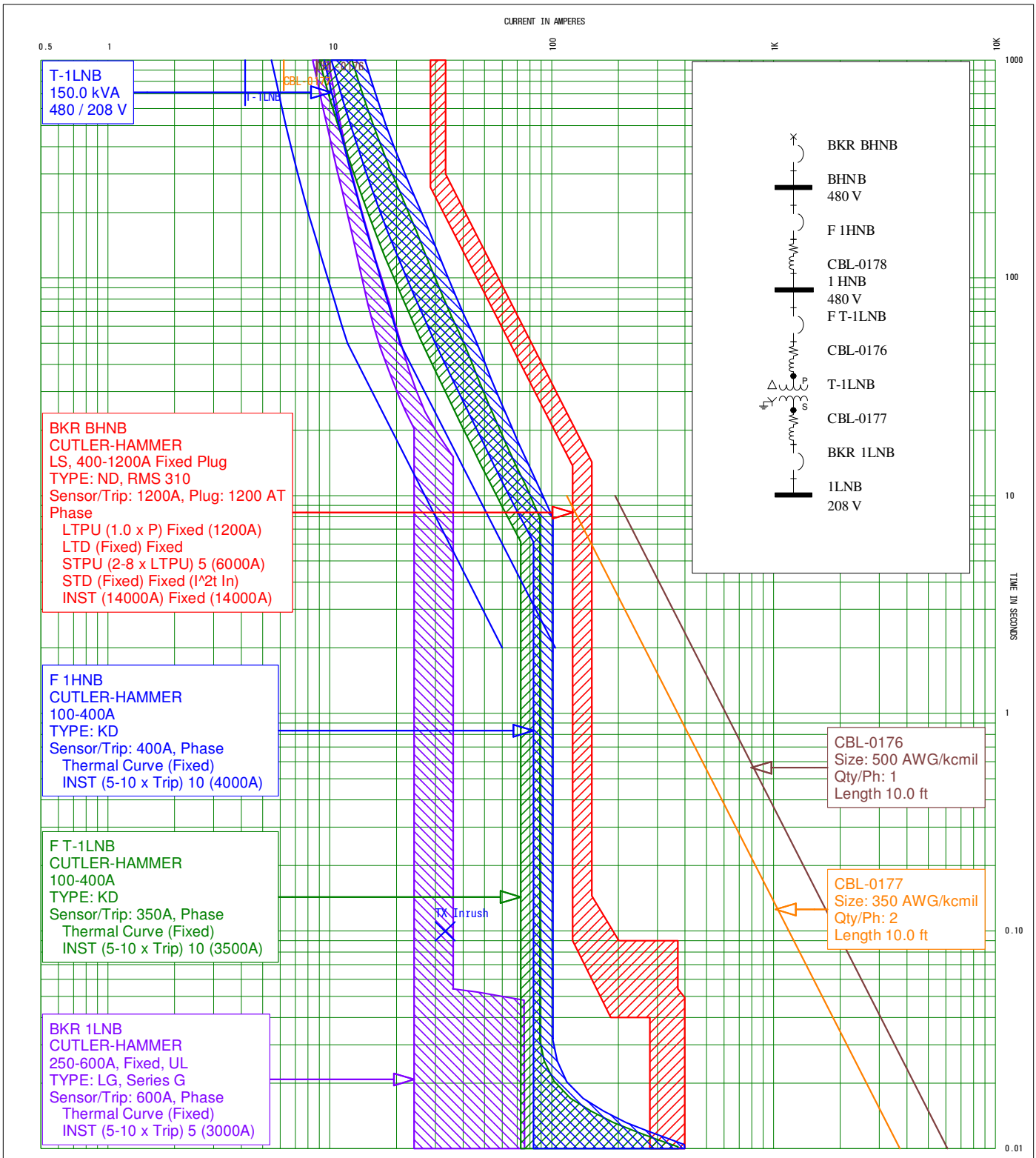
Eaton Electrical Services and Systems November 28, 2012	Plot name: 27_BHNA HKD Ref. Voltage: 480V Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 28_BLNA DK Ref. Voltage: 208V Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 29_LVB F BHNB Ref. Voltage: 480V Current Scale: x 100



Eaton Electrical Services and Systems
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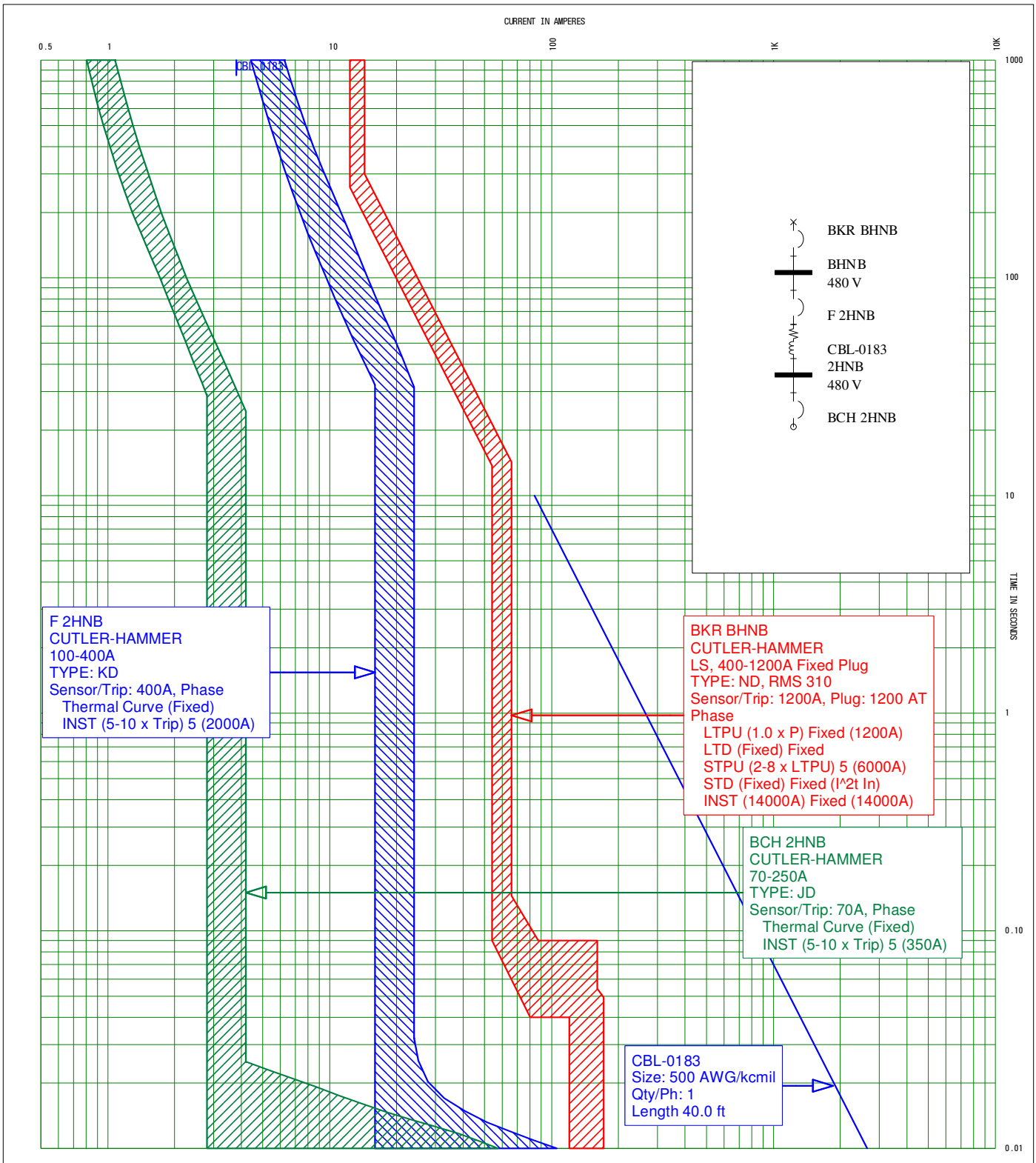
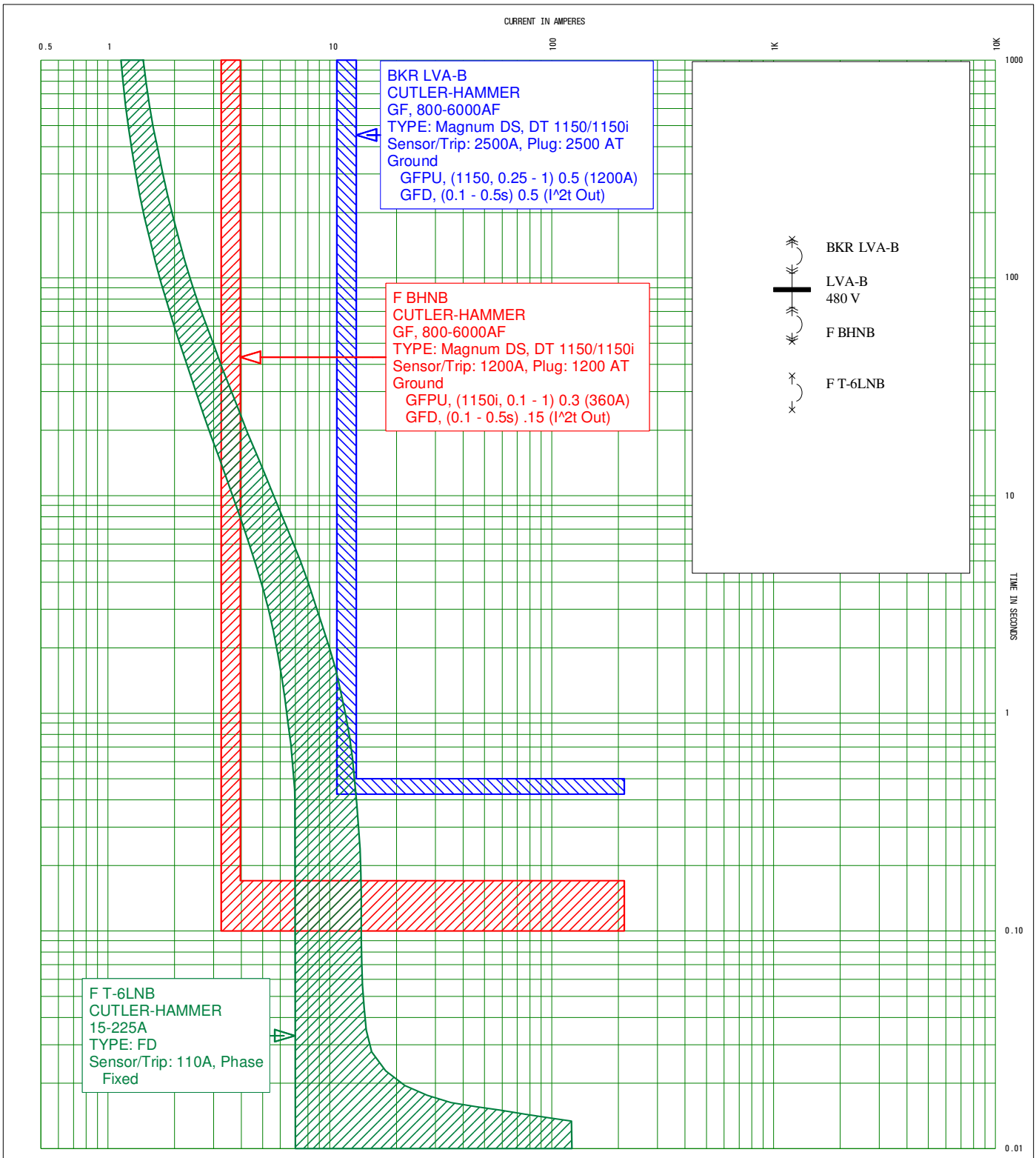
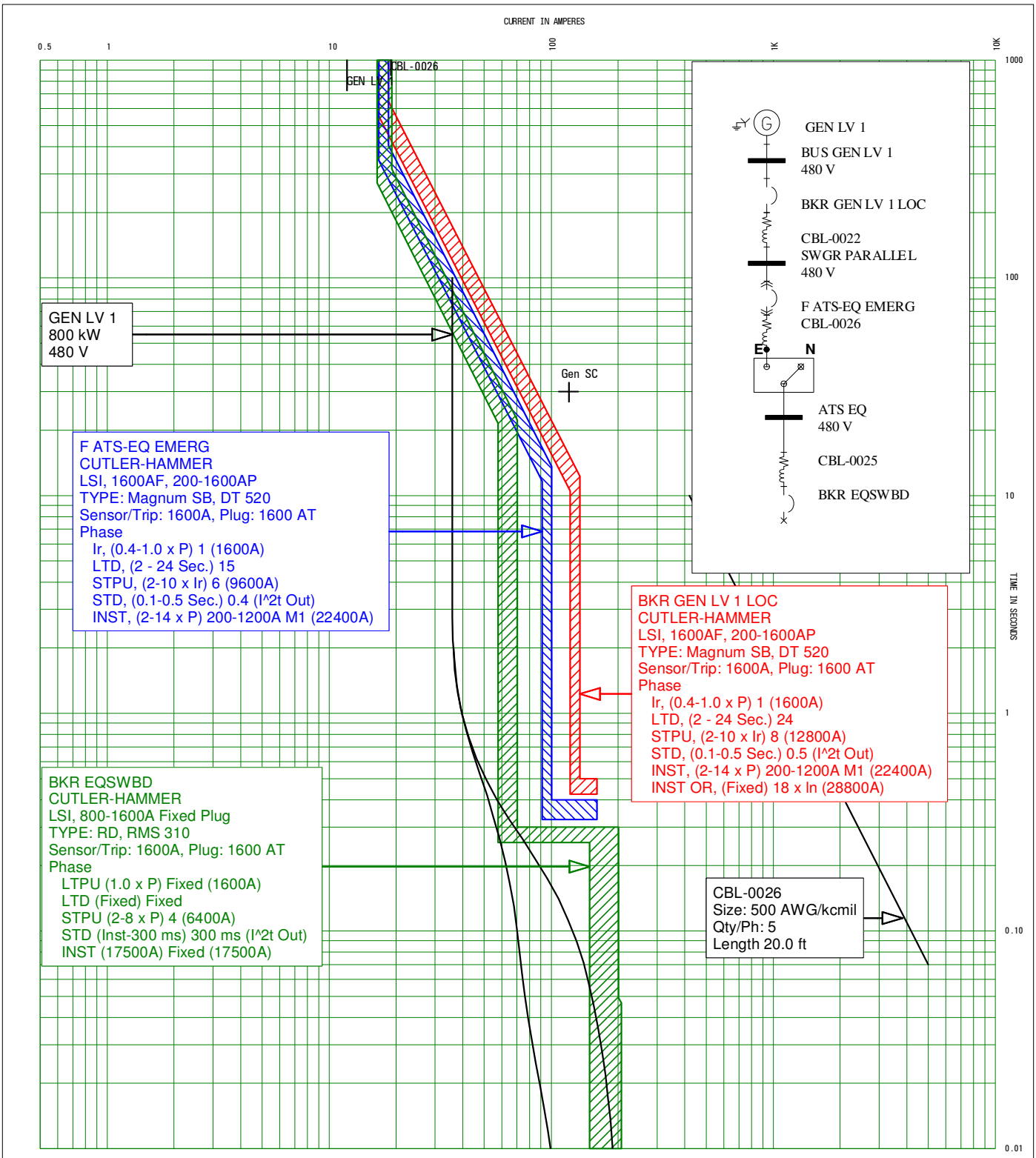
Plot name: 30_BHNB KD
Ref. Voltage: 208V
Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 31_2HNB JD Ref. Voltage: 480V Current Scale: x 100

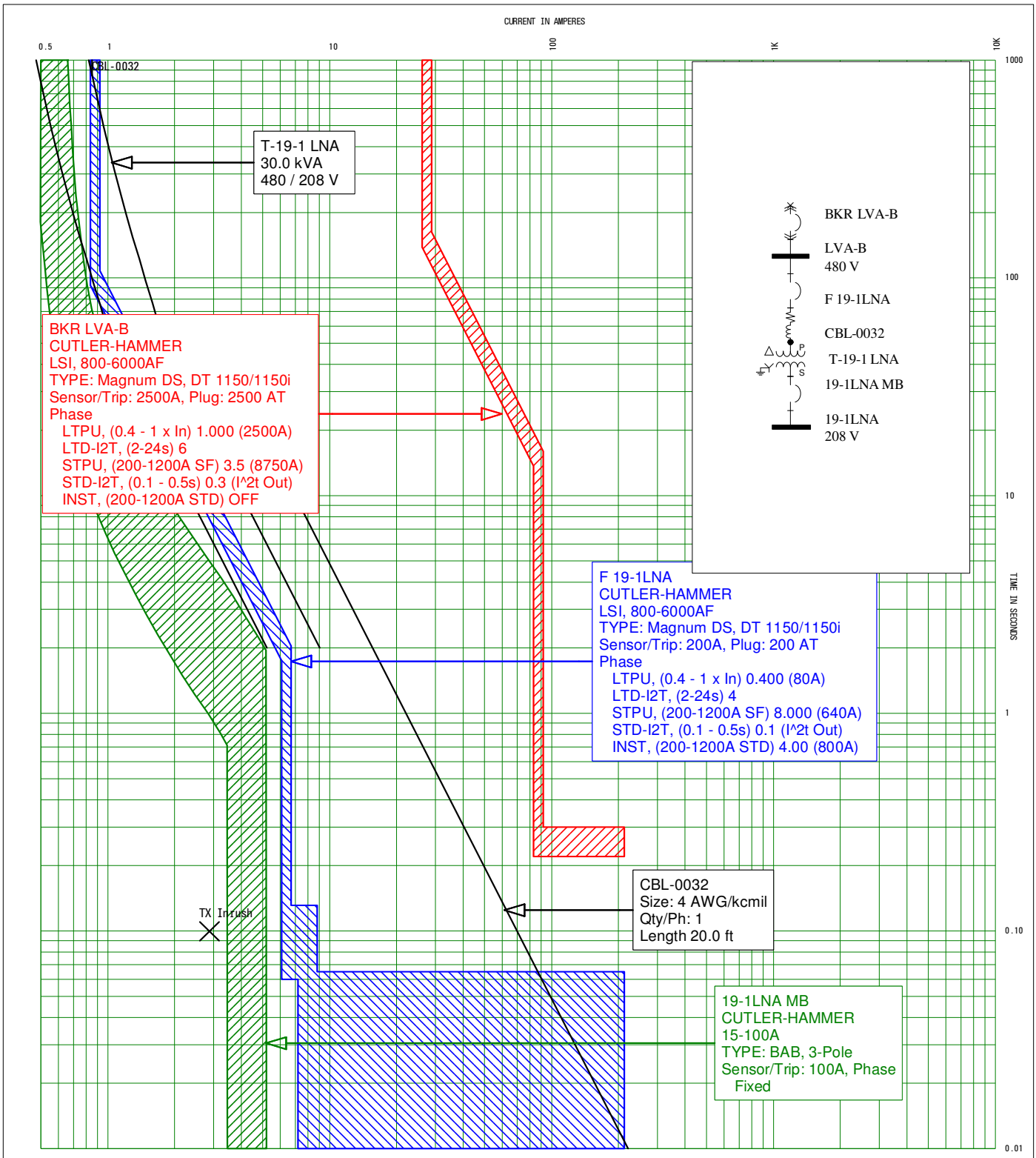


Eaton Electrical Services and Systems November 28, 2012	Plot name: 32_LVB F BHNB Gnd Ref. Voltage: 480V Current Scale: x 100

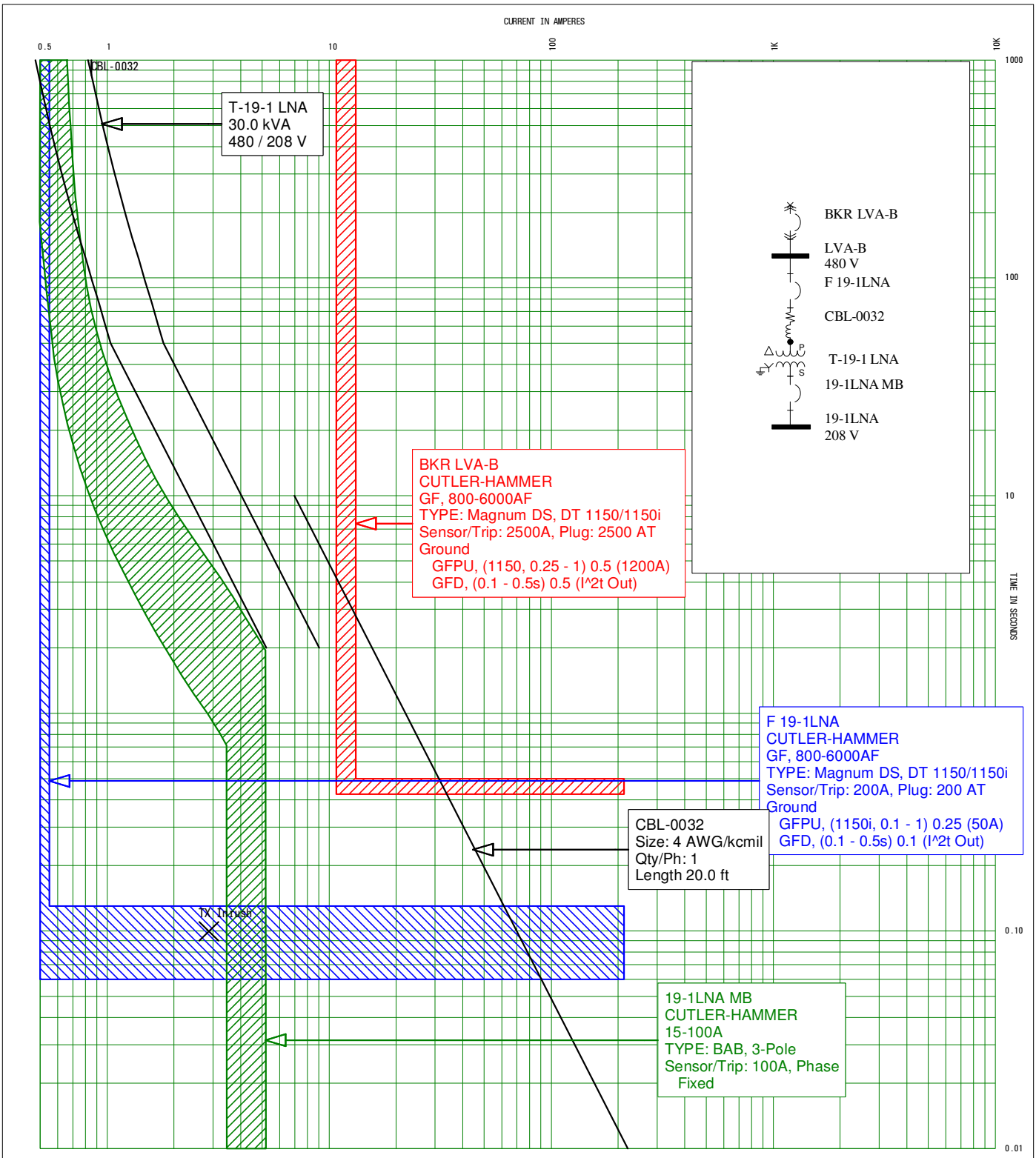


Eaton Electrical Services and Systems
November 28, 2012

Plot name: 33_GEN BKR
Ref. Voltage: 480V
Current Scale: x 100

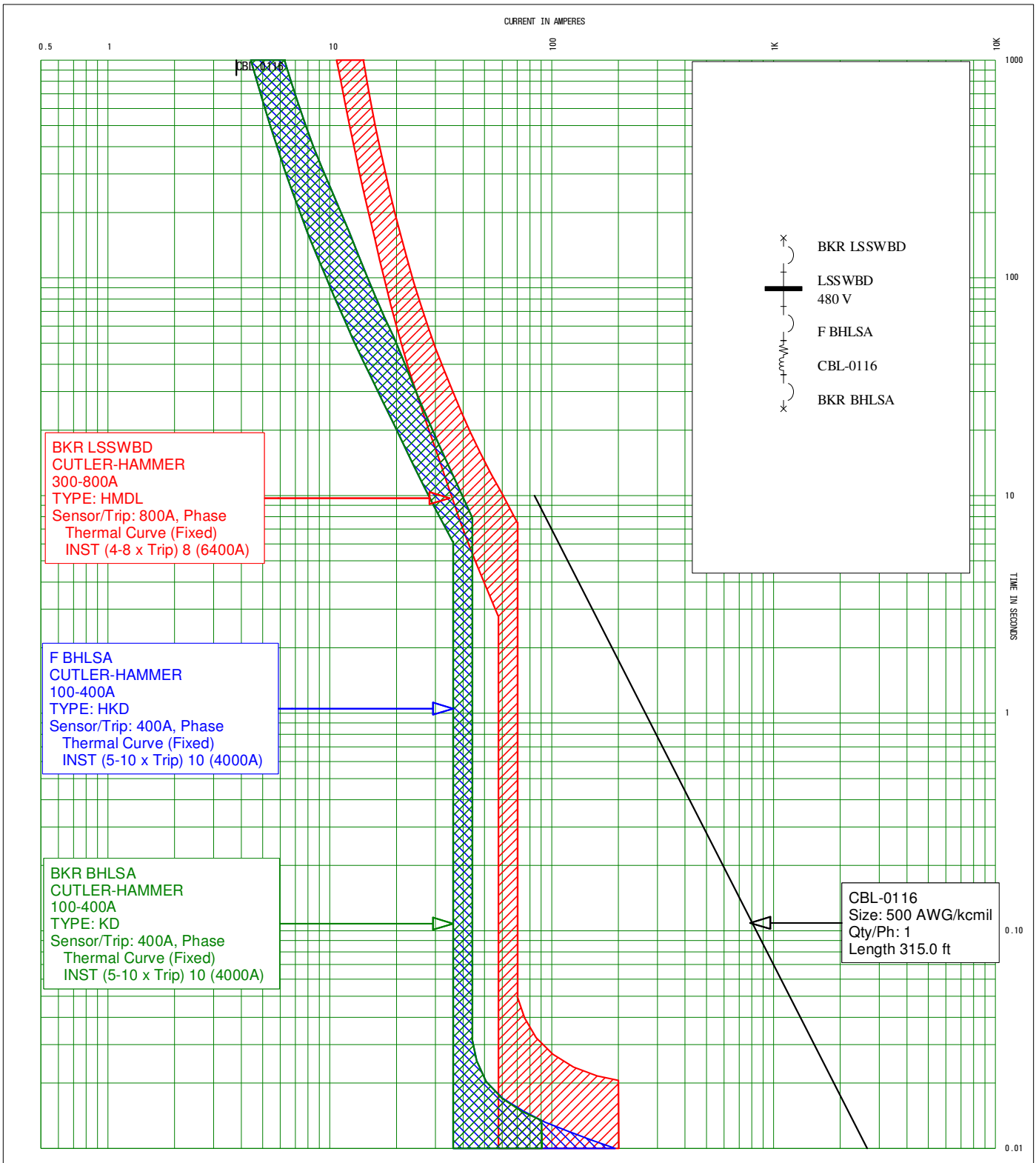


Eaton Electrical Services and Systems November 28, 2012	Plot name: 34_F 19-1LNA Ref. Voltage: 480V Current Scale: x 100

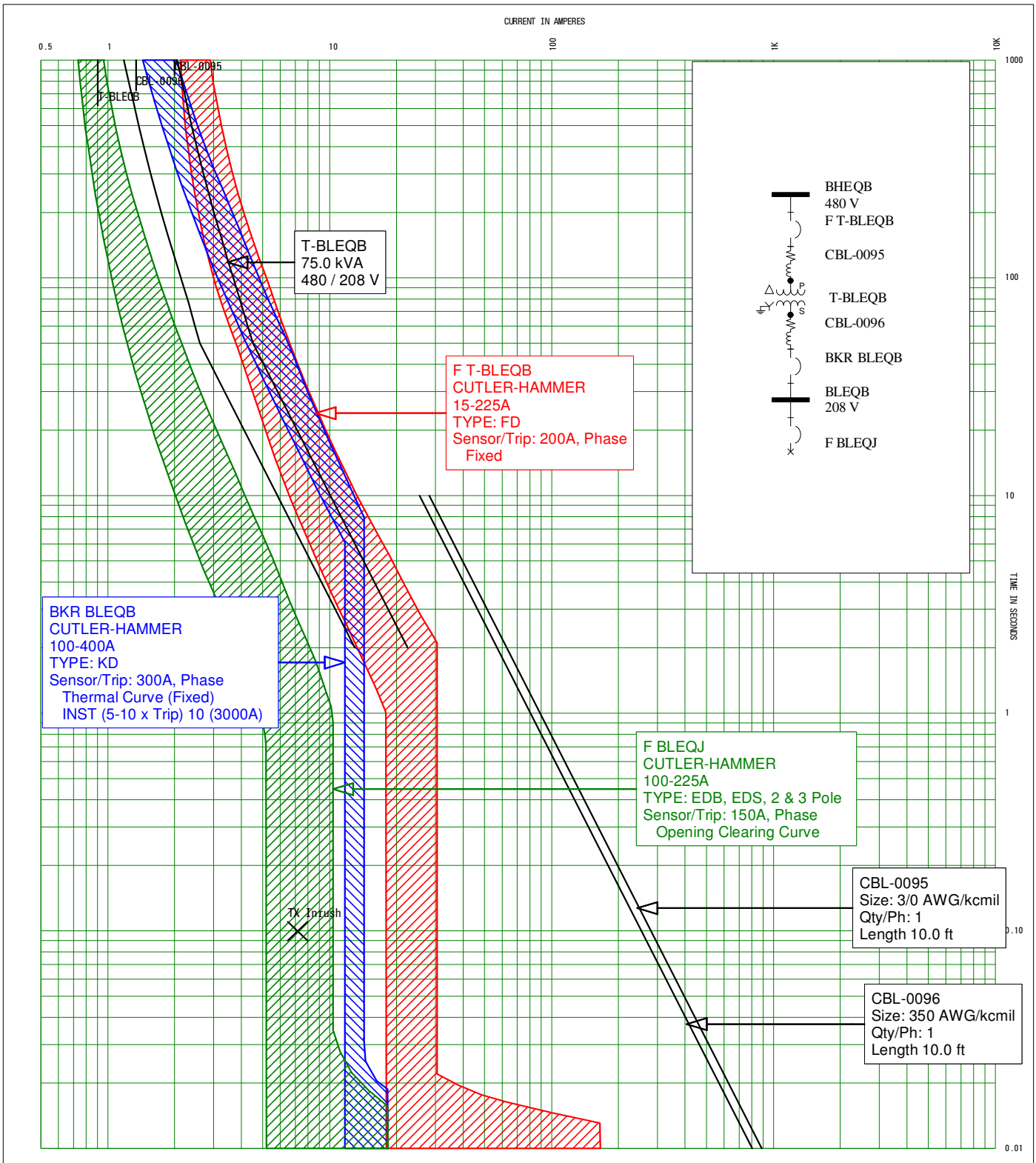


Eaton Electrical Services and Systems
November 28, 2012

Plot name: 35_F 19-1LNA GND
Ref. Voltage: 480V
Current Scale: x 100

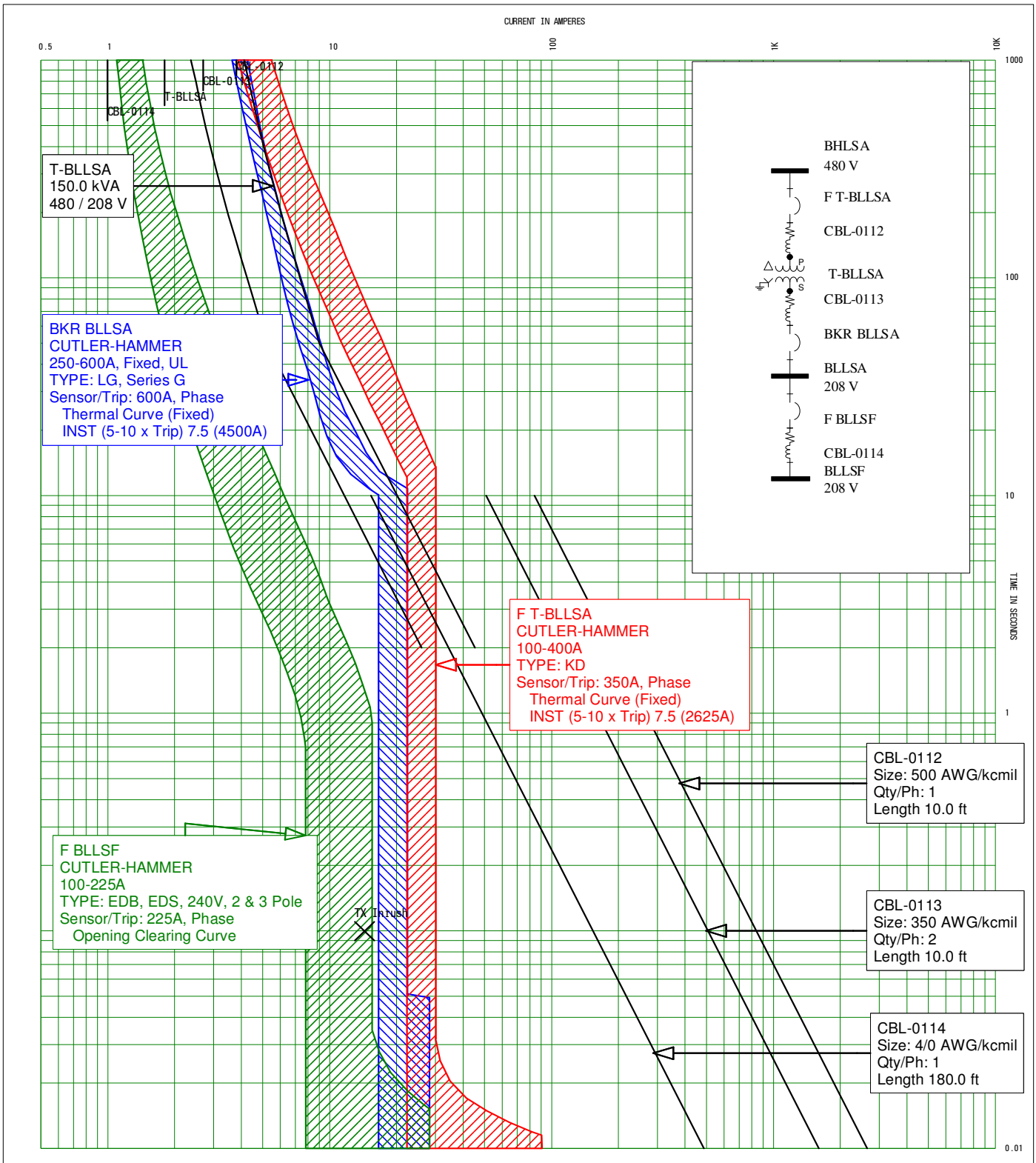


Eaton Electrical Services and Systems November 28, 2012	Plot name: 36_LSSWBD Ref. Voltage: 480V Current Scale: x 100

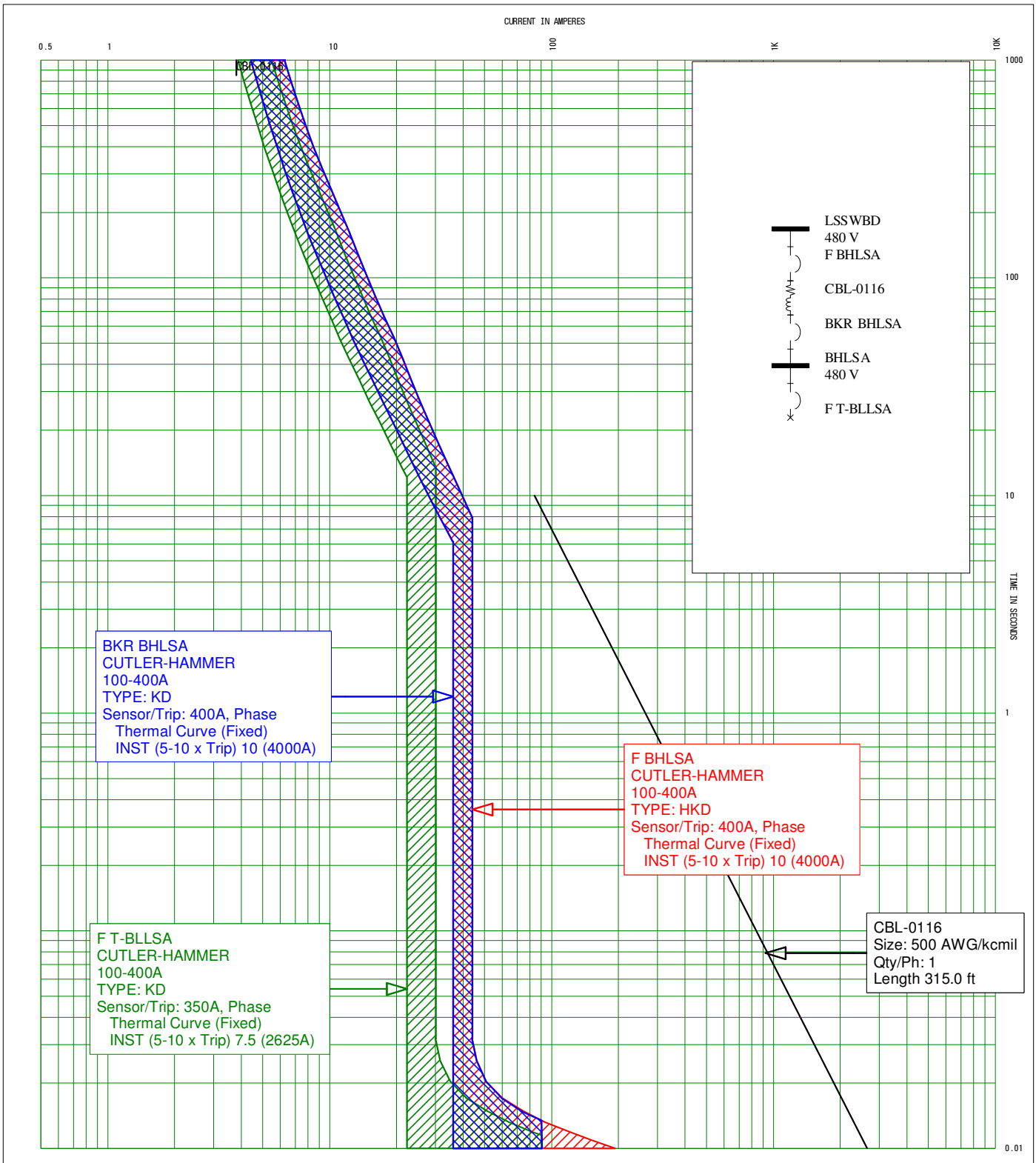


Eaton Electrical Services and Systems
November 28, 2012

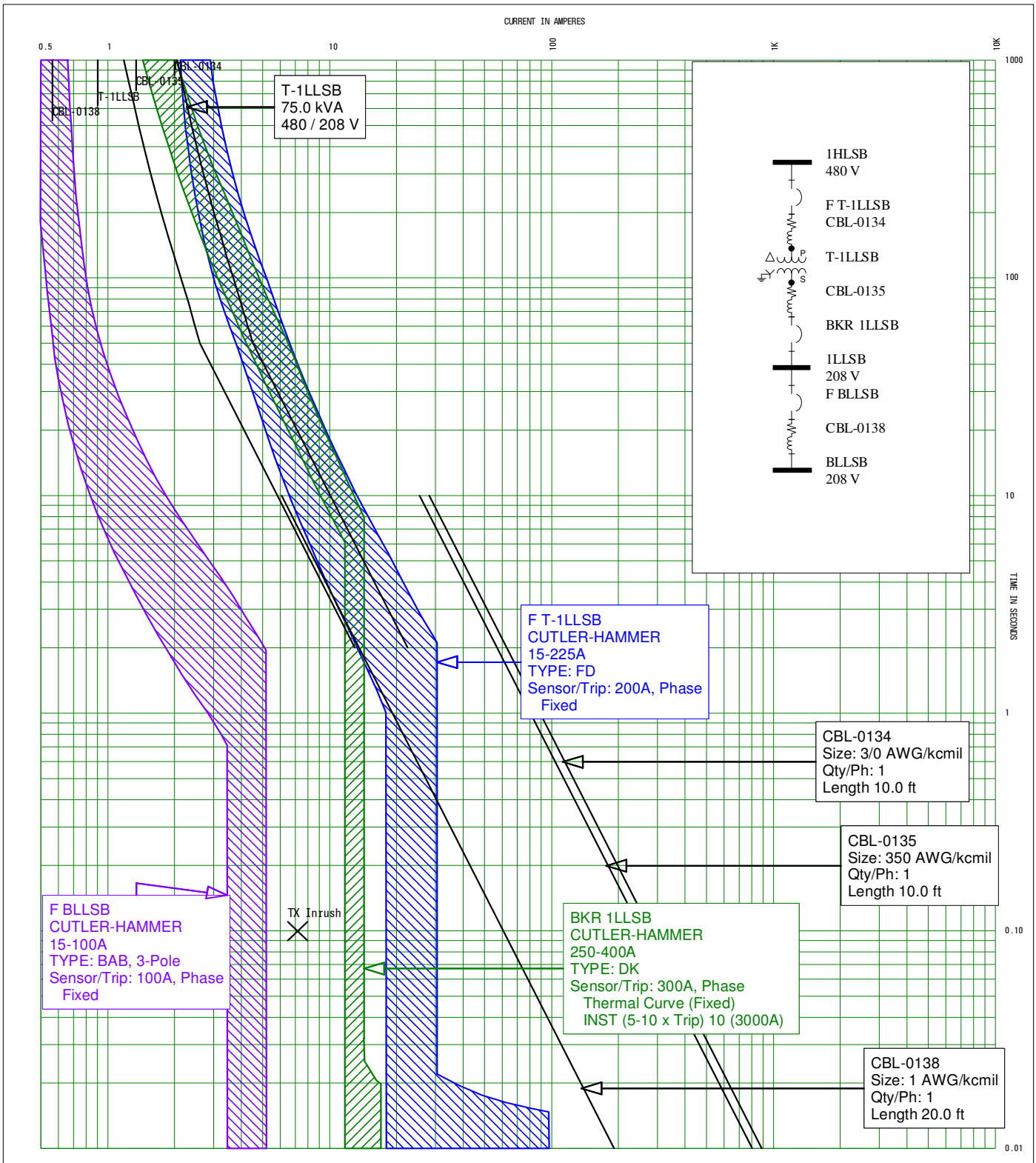
Plot name: 37_BLEQB
Ref. Voltage: 480V
Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 38_BLLSA LG Ref. Voltage: 480V Current Scale: x 100

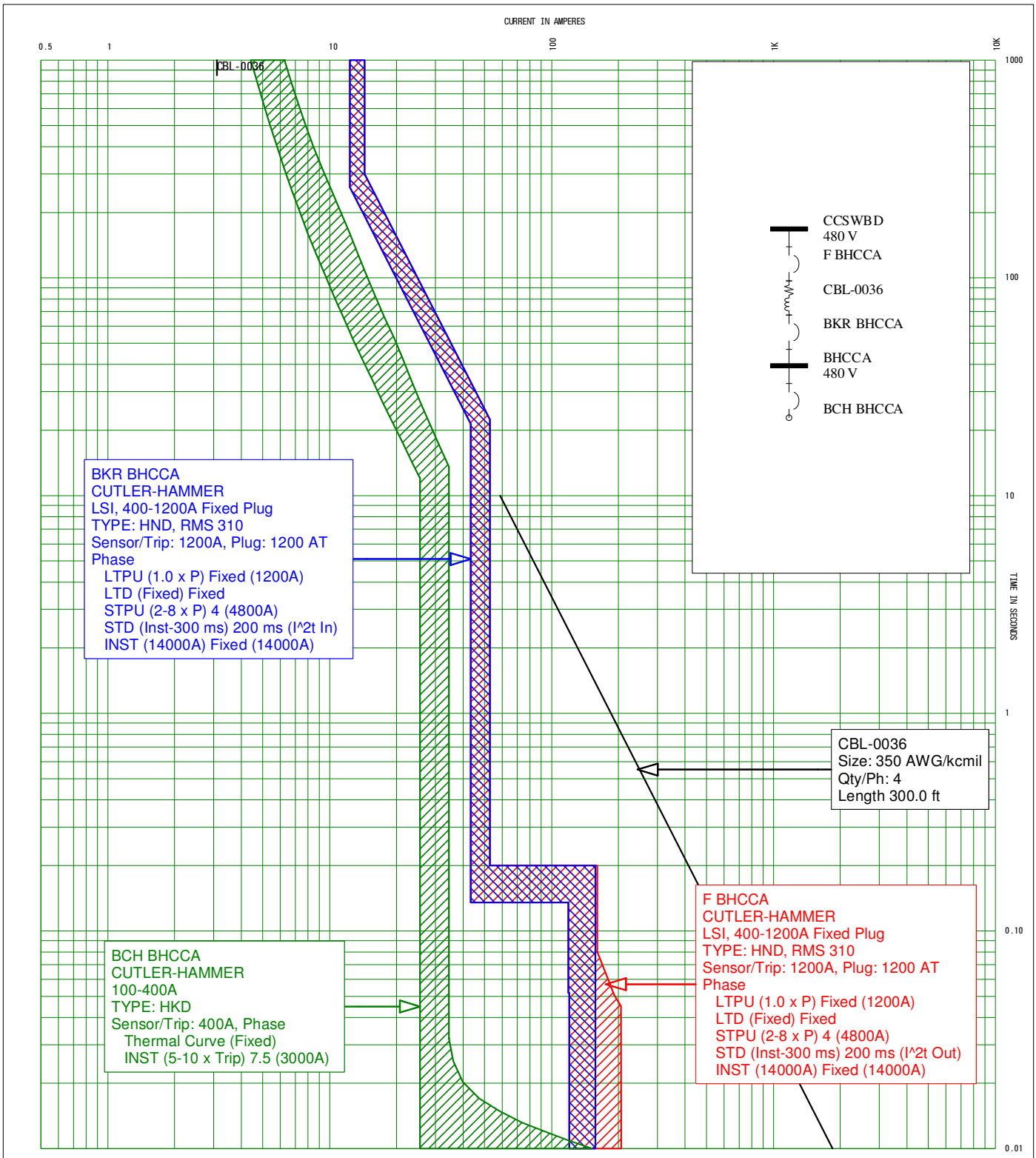


Eaton Electrical Services and Systems November 28, 2012	Plot name: 39_BHLSA KD Ref. Voltage: 480V Current Scale: x 100

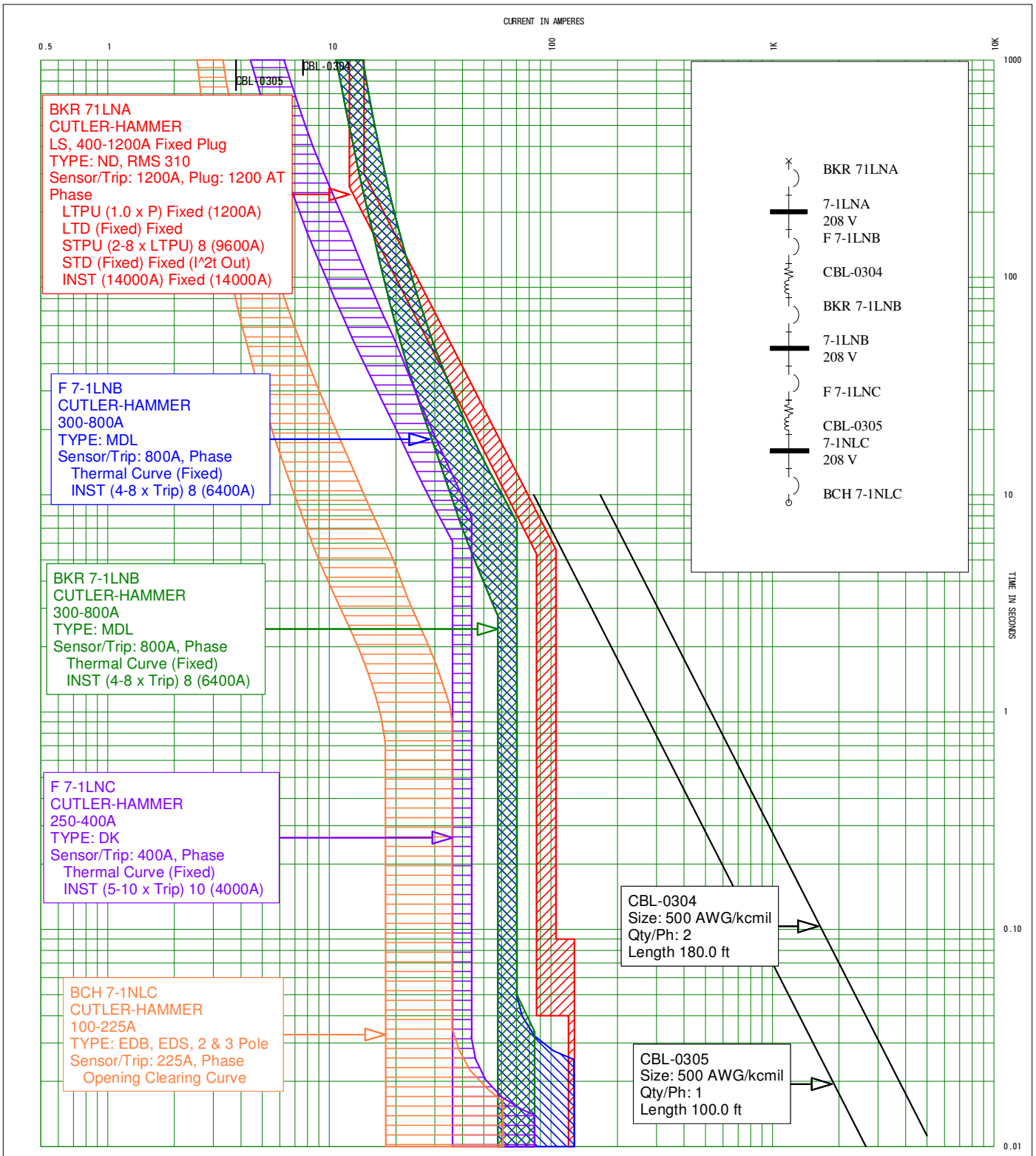


Eaton Electrical Services and Systems
November 28, 2012

Plot name: 40_1LLSB DK
Ref. Voltage: 480V
Current Scale: x 100



Eaton Electrical Services and Systems November 28, 2012	Plot name: 41_BHCCA HKD Ref. Voltage: 480V Current Scale: x 100



Eaton Electrical Services and Systems
November 28, 2012

Plot name: 42_7-1LNA ND
Ref. Voltage: 208V
Current Scale: x 100

4.0 RECOMMENDED PROTECTIVE DEVICE SETTINGS

The following tables show a comprehensive summary of the recommended settings for the adjustable protective devices. Refer to Appendix C for the system one line diagrams.

Table 4.1 - Recommended Low-Voltage Protective Device Settings

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
BCH 2HEQA	CUTLER-HAMMER	250A	Thermal Curve (Fixed)	3-26
Thermal Magnetic	JD	70A	INST (5-10 x Trip) 5 (350A)	
	70-250A			
BCH 2HEQB	CUTLER-HAMMER	250A	Thermal Curve (Fixed)	3-28
Thermal Magnetic	JD	250A	INST (5-10 x Trip) 5 (1250A)	
	70-250A			
BCH 2HNA	CUTLER-HAMMER	250A	Thermal Curve (Fixed)	3-34
Thermal Magnetic	JD	70A	INST (5-10 x Trip) 10 (700A)	
	70-250A			
BCH 2HNB	CUTLER-HAMMER	250A	Thermal Curve (Fixed)	3-38
Thermal Magnetic	JD	70A	INST (5-10 x Trip) 5 (350A)	
	70-250A			
BCH BHCCA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-48
Thermal Magnetic	HKD	400A	INST (5-10 x Trip) 7.5 (3000A)	
	100-400A			
BCH BLCCA	CUTLER-HAMMER	250A	Thermal Curve (Fixed)	3-28
Thermal Magnetic	JD	250A	INST (5-10 x Trip) 5 (1250A)	
	70-250A			
BKR 1LCCB	CUTLER-HAMMER	600A	Thermal Curve (Fixed)	3-19
Thermal Magnetic	LG, Series G	600A	INST (5-10 x Trip) 10 (6000A)	
	250-600A, Fixed, UL			
BKR 1LLSB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-47
Thermal Magnetic	DK	300A	INST (5-10 x Trip) 10 (3000A)	
	250-400A			
BKR 1LNB	CUTLER-HAMMER	600A	Thermal Curve (Fixed)	3-37
Thermal Magnetic	LG, Series G	600A	INST (5-10 x Trip) 5 (3000A)	
	250-600A, Fixed, UL			
BKR 3LCCB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-20
Thermal Magnetic	DK	250A	INST (5-10 x Trip) 10 (2500A)	
	250-400A			

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
BKR 5LCCB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-47
Thermal Magnetic	DK	300A	INST (5-10 x Trip) 10 (3000A)	
	250-400A			
BKR 7-1LNB	CUTLER-HAMMER	800A	Thermal Curve (Fixed)	3-49
Thermal Magnetic	MDL	800A	INST (4-8 x Trip) 8 (6400A)	
	300-800A			
BKR 71LNA	CUTLER-HAMMER	1200A	LTPU (1.0 x P) Fixed (1200A)	3-49
Static Trip	ND, RMS 310	1200A	LTD (Fixed) Fixed	
	LS, 400-1200A Fixed Plug	1200A	STPU (2-8 x LTPU) 8 (9600A)	
			STD (Fixed) Fixed (I^2t Out)	
			INST (14000A) Fixed (14000A)	
BKR BHCCA	CUTLER-HAMMER	1200A	LTPU (1.0 x P) Fixed (1200A)	3-16
Static Trip	HND, RMS 310	1200A	LTD (Fixed) Fixed	
	LSI, 400-1200A Fixed Plug	1200A	STPU (2-8 x P) 4 (4800A)	
			STD (Inst-300 ms) 200 ms (I^2t In)	
			INST (14000A) Fixed (14000A)	
BKR BHCCB	CUTLER-HAMMER	1200A	LTPU (1.0 x P) Fixed (1200A)	3-14
Static Trip	ND, RMS 310	1200A	LTD (Fixed) Fixed	
	LS, 400-1200A Fixed Plug	1200A	STPU (2-8 x LTPU) 4 (4800A)	
			STD (Fixed) Fixed (I^2t In)	
			INST (14000A) Fixed (14000A)	
BKR BHEQA	CUTLER-HAMMER	1200A	Phase	3-22
Static Trip	HND, RMS 310	1200A	LTPU (1.0 x P) Fixed (1200A)	
	LSI, 400-1200A Fixed Plug	1200A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 4 (4800A)	
			STD (Inst-300 ms) 200 ms (I^2t Out)	
			INST (14000A) Fixed (14000A)	
			Ground	3-23
			GFPU (2-6 x Ig) 3 x Ig (600A)	
			GFD (Inst-500 ms) 150 ms (I^2t Out)	

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
BKR BHEQB	CUTLER-HAMMER	1200A	Phase	3-28
Static Trip	HND, RMS 310	1200A	LTPU (1.0 x P) Fixed (1200A)	
	LSI, 400-1200A Fixed Plug	1200A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 3 (3600A)	
			STD (Inst-300 ms) 100 ms (I^2t Out)	
			INST (14000A) Fixed (14000A)	
			Ground	3-23
			GFPU (2-6 x Ig) 3 x Ig (600A)	
			GFD (Inst-500 ms) 150 ms (I^2t Out)	
BKR BHLSA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-43
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
BKR BHLSB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-43
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
BKR BHNA	CUTLER-HAMMER	1200A	Phase	3-31
Static Trip	HND, RMS 310	1200A	LTPU (1.0 x P) Fixed (1200A)	
	LSI, 400-1200A Fixed Plug	1200A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 5 (6000A)	
			STD (Inst-300 ms) 200 ms (I^2t Out)	
			INST (14000A) Fixed (14000A)	
			Ground	3-32
			GFPU (1 x Ig) 1 x Ig (200A)	
			GFD (Inst-500 ms) 150 ms (I^2t Out)	
BKR BHNB	CUTLER-HAMMER	1200A	LTPU (1.0 x P) Fixed (1200A)	3-36
Static Trip	ND, RMS 310	1200A	LTD (Fixed) Fixed	
	LS, 400-1200A Fixed Plug	1200A	STPU (2-8 x LTPU) 5 (6000A)	
			STD (Fixed) Fixed (I^2t In)	
			INST (14000A) Fixed (14000A)	

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
BKR BLCCA	CUTLER-HAMMER	1200A	Phase	3-16
Static Trip	ND, RMS 310	1200A	LTPU (1.0 x P) Fixed (1200A)	
	LSI, 400-1200A Fixed Plug	1200A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 5 (6000A)	
			STD (Inst-300 ms) 100 ms (I^2t Out)	
			INST (14000A) Fixed (14000A)	
			Ground	
			GFPU (2-6 x Ig) 2 x Ig (400A)	
			GFD (Inst-500 ms) 150 ms (I^2t Out)	
BKR BLCCB	CUTLER-HAMMER	1200A	LTPU (1.0 x P) Fixed (1200A)	3-21
Static Trip	ND, RMS 310	1200A	LTD (Fixed) Fixed	
	LS, 400-1200A Fixed Plug	1200A	STPU (2-8 x LTPU) 6 (7200A)	
			STD (Fixed) Fixed (I^2t Out)	
			INST (14000A) Fixed (14000A)	
BKR BLEQA	CUTLER-HAMMER	2000A	Phase	3-24
Static Trip	RD, RMS 310	2000A	LTPU (1.0 x P) Fixed (2000A)	
	LSI, 1000-2000A Fixed Plug	2000A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 2 (4000A)	
			STD (Inst-300 ms) 100 ms (I^2t Out)	
			INST (17500A) Fixed (17500A)	
			Ground	
			GFPU (B-K) C (600A)	
			GFD (Inst-500 ms) 150 ms (I^2t Out)	
BKR BLEQB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-44
Thermal Magnetic	KD	300A	INST (5-10 x Trip) 10 (3000A)	
	100-400A			
BKR BLLSA	CUTLER-HAMMER	600A	Thermal Curve (Fixed)	3-45
Thermal Magnetic	LG, Series G	600A	INST (5-10 x Trip) 7.5 (4500A)	
	250-600A, Fixed, UL			

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
BKR BLNA	CUTLER-HAMMER	2000A	Phase	3-33
Static Trip	RD, RMS 310	2000A	LTPU (1.0 x P) Fixed (2000A)	
	LSI, 1000-2000A Fixed Plug	2000A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 3 (6000A)	
			STD (Inst-300 ms) 100 ms (I^2t Out)	
			INST (17500A) Fixed (17500A)	
			Ground	
			GFPU (B-K) C (600A)	
			GFD (Inst-500 ms) 150 ms (I^2t Out)	
BKR CCSWBD	CUTLER-HAMMER	1600A	Phase	3-13
Static Trip	RD, RMS 310	1600A	LTPU (1.0 x P) Fixed (1600A)	
	LSI, 800-1600A Fixed Plug	1600A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 4 (6400A)	
			STD (Inst-300 ms) 300 ms (I^2t Out)	
			INST (17500A) Fixed (17500A)	
			Ground	3-11
			GFPU (B-K) B (400A)	
			GFD (Inst-500 ms) 300 ms (I^2t Out)	
BKR DIST PNL R	CUTLER-HAMMER	800A	Thermal Curve (Fixed)	3-25
Thermal Magnetic	MDL	800A	INST (4-8 x Trip) 4 (3200A)	
	300-800A			
BKR EQSWBD	CUTLER-HAMMER	1600A	Phase	3-22
Static Trip	RD, RMS 310	1600A	LTPU (1.0 x P) Fixed (1600A)	
	LSI, 800-1600A Fixed Plug	1600A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 4 (6400A)	
			STD (Inst-300 ms) 300 ms (I^2t Out)	
			INST (17500A) Fixed (17500A)	
			Ground	3-23
			GFPU (B-K) D (800A)	
			GFD (Inst-500 ms) 300 ms (I^2t Out)	

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
BKR GEN LV 1 LOC	CUTLER-HAMMER	1600A	Phase	3-40
Static Trip	Magnum SB, DT 520	1600A	Ir, (0.4-1.0 x P) 1 (1600A)	
	LSI, 1600AF, 200-1600AP	1600A	LTD, (2 - 24 Sec.) 24	
			STPU, (2-10 x Ir) 8 (12800A)	
			STD, (0.1-0.5 Sec.) 0.5 (I^2t Out)	
			INST, (2-14 x P) 200-1200A M1 (22400A)	
			INST OR, (Fixed) 18 x In (28800A)	
			Ground	
			GFPU (0.25-1.00 x P 200-1200A) 0.25 (400A)	
			GFD (0.1-0.5 Sec.) 0.2 (I^2t Out)	
			MMS	
			ARMS R5 (4000A)	
BKR GEN LV 2 LOC	CUTLER-HAMMER	1600A	Phase	3-40
Static Trip	Magnum SB, DT 520	1600A	Ir, (0.4-1.0 x P) 1 (1600A)	
	LSI, 1600AF, 200-1600AP	1600A	LTD, (2 - 24 Sec.) 24	
			STPU, (2-10 x Ir) 8 (12800A)	
			STD, (0.1-0.5 Sec.) 0.5 (I^2t Out)	
			INST, (2-14 x P) 200-1200A M1 (22400A)	
			INST OR, (Fixed) 18 x In (28800A)	
			Ground	
			GFPU (0.25-1.00 x P 200-1200A) 0.25 (400A)	
			GFD (0.1-0.5 Sec.) 0.2 (I^2t Out)	
			MMS	
			ARMS R5 (4000A)	
BKR LSSWBD	CUTLER-HAMMER	800A	Thermal Curve (Fixed)	3-29
Thermal Magnetic	HMDL	800A	INST (4-8 x Trip) 8 (6400A)	
	300-800A			
BKR LVA-A	CUTLER-HAMMER	3200A	Phase	3-10
Static Trip	Magnum DS, DT 1150/1150i	2500A	LTPU, (0.4 - 1 x In) 1.000 (2500A)	
	LSI, 800-6000AF	2500A	LTD-I2T, (2-24s) 8	
			STPU, (200-1200A SF) 3.000 (7500A)	
			STD-I2T, (0.1 - 0.5s) 0.4 (I^2t Out)	
			INST, (200-1200A STD) OFF	
			Maint	
			ARMS 2.5x (6250A)	
			Ground	3-11
			GFPU, (1150, 0.25 - 1) 0.48 (1200A)	
			GFD, (0.1 - 0.5s) 0.5 (I^2t Out)	

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
BKR LVA-B	CUTLER-HAMMER	3200A	Phase	3-29
Static Trip	Magnum DS, DT 1150/1150i	2500A	LTPU, (0.4 - 1 x In) 1.000 (2500A)	
	LSI, 800-6000AF	2500A	LTD-I2T, (2-24s) 6	
			STPU, (200-1200A SF) 3.5 (8750A)	
			STD-I2T, (0.1 - 0.5s) 0.3 (I^2t Out)	
			INST, (200-1200A STD) OFF	
			Maint	
			ARMS 2.5x (6250A)	
			Ground	3-30
			GFPU, (1150, 0.25 - 1) 0.5 (1200A)	
			GFD, (0.1 - 0.5s) 0.5 (I^2t Out)	
BKR PLEQA	CUTLER-HAMMER	800A	Thermal Curve (Fixed)	3-25
Thermal Magnetic	MDL	800A	INST (4-8 x Trip) 4 (3200A)	
	300-800A			
BKR TIE LVA	CUTLER-HAMMER	3200A	Phase	3-10
Static Trip	Magnum DS, DT 1150/1150i	2500A	LTPU, (0.4 - 1 x In) 1.000 (2500A)	
	LSI, 800-6000AF	2500A	LTD-I2T, (2-24s) 8	
			STPU, (200-1200A SF) 3.000 (7500A)	
			STD-I2T, (0.1 - 0.5s) 0.4 (I^2t Out)	
			INST, (200-1200A STD) OFF	
			Maint	
			ARMS 2.5x (6250A)	
			Ground	3-11
			GFPU, (1150, 0.25 - 1) 0.35 (875A)	
			GFD, (0.1 - 0.5s) 0.4 (I^2t Out)	
F 19-1LNA	CUTLER-HAMMER	800A	Phase	3-41
Static Trip	Magnum DS, DT 1150/1150i	200A	LTPU, (0.4 - 1 x In) 0.400 (80A)	
	LSI, 800-6000AF	200A	LTD-I2T, (2-24s) 4	
			STPU, (200-1200A SF) 8.000 (640A)	
			STD-I2T, (0.1 - 0.5s) 0.1 (I^2t Out)	
			INST, (200-1200A STD) 4.00 (800A)	
			Maint	
			ARMS 4.0x (800A)	
			Ground	3-42
			GFPU, (1150i, 0.1 - 1) 0.25 (50A)	
			GFD, (0.1 - 0.5s) 0.1 (I^2t Out)	

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
F 1HCCB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-15
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
F 1HNB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-36
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
F 1LCCA	CUTLER-HAMMER	600A	Thermal Curve (Fixed)	3-17
Thermal Magnetic	LG, Series G	600A	INST (5-10 x Trip) 5 (3000A)	
	250-600A, Fixed, UL			
F 1LEQA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-24
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 5 (2000A)	
	250-400A			
F 1LNA	CUTLER-HAMMER	600A	Thermal Curve (Fixed)	3-33
Thermal Magnetic	LG, Series G	600A	INST (5-10 x Trip) 7.5 (4500A)	
	250-600A, Fixed, UL			
F 2CB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-24
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 5 (2000A)	
	250-400A			
F 2HEQA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-26
Thermal Magnetic	HKD	400A	INST (5-10 x Trip) 5 (2000A)	
	100-400A			
F 2HEQB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-28
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 5 (2000A)	
	100-400A			
F 2HNA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-34
Thermal Magnetic	HKD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
F 2HNB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-38
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 5 (2000A)	
	100-400A			

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
F 2LCCB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-19
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 10 (4000A)	
	250-400A			
F 2LCCE	CUTLER-HAMMER	250A	Thermal Curve (Fixed)	3-19
Thermal Magnetic	JD	150A	INST (5-10 x Trip) 10 (1500A)	
	70-250A			
F 2LCCF	CUTLER-HAMMER	250A	Thermal Curve (Fixed)	3-19
Thermal Magnetic	JD	150A	INST (5-10 x Trip) 10 (1500A)	
	70-250A			
F 3A1	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-18
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 10 (4000A)	
	250-400A			
F 3HNB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-38
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
F 3LCCA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-18
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 10 (4000A)	
	250-400A			
F 3LEQA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-18
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 5 (2000A)	
	250-400A			
F 3LNA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-35
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 10 (4000A)	
	250-400A			
F 4DP	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-35
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 10 (4000A)	
	250-400A			
F 4HEQA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-26
Thermal Magnetic	HKD	400A	INST (5-10 x Trip) 5 (2000A)	
	100-400A			

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
F 4HEQB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-38
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 5 (2000A)	
	100-400A			
F 4HNA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-34
Thermal Magnetic	HKD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
F 4HNB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-34
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
F 5LCCA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-35
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 10 (4000A)	
	250-400A			
F 5LEQA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-24
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 5 (2000A)	
	250-400A			
F 5LNA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-35
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 10 (4000A)	
	250-400A			
F 6HEQA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-26
Thermal Magnetic	HKD	400A	INST (5-10 x Trip) 5 (2000A)	
	100-400A			
F 6HEQB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-38
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 5 (2000A)	
	100-400A			
F 6HNA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-34
Thermal Magnetic	HKD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
F 6HNB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-34
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
F 7-1LNB	CUTLER-HAMMER	800A	Thermal Curve (Fixed)	3-49
Thermal Magnetic	MDL	800A	INST (4-8 x Trip) 8 (6400A)	
	300-800A			
F 7-1LNC	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-49
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 10 (4000A)	
	250-400A			
F ATS-CC EMERG	CUTLER-HAMMER	1600A	Phase	3-10
Static Trip	Magnum SB, DT 520	1600A	Ir, (0.4-1.0 x P) 1 (1600A)	
	LSI, 1600AF, 200-1600AP	1600A	LTD, (2 - 24 Sec.) 15	
			STPU, (2-10 x Ir) 6 (9600A)	
			STD, (0.1-0.5 Sec.) 0.4 (I^2t Out)	
			INST, (2-14 x P) 200-1200A M1 (22400A)	
			MMS	
			ARMS R4 (6400A)	
F ATS-CC NORM	CUTLER-HAMMER	1600A	Phase	3-10
Static Trip	Magnum DS, DT 1150/1150i	1600A	LTPU, (0.4 - 1 x In) 1.000 (1600A)	
	LSI, 800-6000AF	1600A	LTD-I2T, (2-24s) 12.5	
			STPU, (200-1200A SF) 4.000 (6400A)	
			STD-I2T, (0.1 - 0.5s) 0.3 (I^2t Out)	
			INST, (200-1200A STD) 10.00 (16000A)	
			Maint	
			ARMS 2.5x (4000A)	
			Ground	3-11
			GFPU, (1150, 0.25 - 1) 0.4 (640A)	
			GFD, (0.1 - 0.5s) 0.3 (I^2t Out)	
F ATS-EQ EMERG	CUTLER-HAMMER	1600A	Phase	3-40
Static Trip	Magnum SB, DT 520	1600A	Ir, (0.4-1.0 x P) 1 (1600A)	
	LSI, 1600AF, 200-1600AP	1600A	LTD, (2 - 24 Sec.) 15	
			STPU, (2-10 x Ir) 6 (9600A)	
			STD, (0.1-0.5 Sec.) 0.4 (I^2t Out)	
			INST, (2-14 x P) 200-1200A M1 (22400A)	
			MMS	
			ARMS R4 (6400A)	

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
F ATS-EQ NORM	CUTLER-HAMMER	1600A	Phase	3-22
Static Trip	Magnum DS, DT 1150/1150i	1600A	LTPU, (0.4 - 1 x In) 1.000 (1600A)	
	LSI, 800-6000AF	1600A	LTD-I2T, (2-24s) 12	
			STPU, (200-1200A SF) 4 (6400A)	
			STD-I2T, (0.1 - 0.5s) 0.3 (I^2t Out)	
			INST, (200-1200A STD) OFF	
			Maint	
			ARMS 2.5x (4000A)	
			Ground	3-23
			GFPU, (1150, 0.25 - 1) 0.75 (1200A)	
			GFD, (0.1 - 0.5s) 0.4 (I^2t Out)	
F ATS-LS EMERG	CUTLER-HAMMER	800A	Phase	3-29
Static Trip	Magnum SB, DT 520	800A	Ir, (0.4-1.0 x P) 1 (800A)	
	LSI, 800AF, 100-800AP	800A	LTD, (2-24 Sec.) 24	
			STPU, (2-10 x Ir) 10 (8000A)	
			STD, (0.1-0.5 Sec.) 0.2 (I^2t Out)	
			INST, (2-14 x P) M1(14) (11200A)	
			INST OR, (Fixed) 18 x In (14400A)	
			MMS	
			ARMS R5 (2000A)	
F ATS-LS NORM	CUTLER-HAMMER	800A	Phase	3-29
Static Trip	Magnum DS, DT 1150/1150i	800A	LTPU, (0.4 - 1 x In) 1.000 (800A)	
	LSI, 800-6000AF	800A	LTD-I2T, (2-24s) 24	
			STPU, (200-1200A SF) 5.5 (4400A)	
			STD-I2T, (0.1 - 0.5s) 0.1 (I^2t Out)	
			INST, (200-1200A STD) 6.00 (4800A)	
			Maint	
			ARMS 2.5x (2000A)	
			Ground	3-30
			GFPU, (1150i, 0.1 - 1) 0.3 (240A)	
			GFD, (0.1 - 0.5s) 0.3 (I^2t Out)	

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
F BHCCA	CUTLER-HAMMER	1200A	Phase	3-16
Static Trip	HND, RMS 310	1200A	LTPU (1.0 x P) Fixed (1200A)	
	LSI, 400-1200A Fixed Plug	1200A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 4 (4800A)	
			STD (Inst-300 ms) 200 ms (I^2t Out)	
			INST (14000A) Fixed (14000A)	
			Ground	3-11
			GFPU (1 x Ig) 1 x Ig (200A)	
			GFD (Inst-500 ms) 150 ms (I^2t Out)	
F BHCCB	CUTLER-HAMMER	1200A	Phase	3-13
Static Trip	HND, RMS 310	1200A	LTPU (1.0 x P) Fixed (1200A)	
	LSI, 400-1200A Fixed Plug	1200A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 4 (4800A)	
			STD (Inst-300 ms) 200 ms (I^2t Out)	
			INST (14000A) Fixed (14000A)	
			Ground	3-11
			GFPU (1 x Ig) 1 x Ig (200A)	
			GFD (Inst-500 ms) 150 ms (I^2t Out)	
F BHEQA	CUTLER-HAMMER	1200A	Phase	3-22
Static Trip	HND, RMS 310	1200A	LTPU (1.0 x P) Fixed (1200A)	
	LSI, 400-1200A Fixed Plug	1200A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 4 (4800A)	
			STD (Inst-300 ms) 200 ms (I^2t Out)	
			INST (14000A) Fixed (14000A)	
			Ground	3-23
			GFPU (2-6 x Ig) 3 x Ig (600A)	
			GFD (Inst-500 ms) 150 ms (I^2t Out)	
F BHEQB	CUTLER-HAMMER	1200A	Phase	3-22
Static Trip	HND, RMS 310	1200A	LTPU (1.0 x P) Fixed (1200A)	
	LSI, 400-1200A Fixed Plug	1200A	LTD (Fixed) Fixed	
			STPU (2-8 x P) 4 (4800A)	
			STD (Inst-300 ms) 200 ms (I^2t Out)	
			INST (14000A) Fixed (14000A)	
			Ground	3-23
			GFPU (2-6 x Ig) 3 x Ig (600A)	
			GFD (Inst-500 ms) 150 ms (I^2t Out)	

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
F BHLSA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-43
Thermal Magnetic	HKD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
F BHLSB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-43
Thermal Magnetic	HKD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
F BHNA	CUTLER-HAMMER	1600A	Phase	3-31
Static Trip	Magnum DS, DT 1150/1150i	1200A	LTPU, (0.4 - 1 x In) 1.000 (1200A)	
	LSI, 800-6000AF	1200A	LTD-I2T, (2-24s) 16	
			STPU, (200-1200A SF) 5 (6000A)	
			STD-I2T, (0.1 - 0.5s) 0.1 (I^2t Out)	
			INST, (200-1200A STD) 12 (14400A)	
			Maint	
			ARMS 2.5x (3000A)	
			Ground	3-32
			GFPU, (1150, 0.25 - 1) 0.3 (360A)	
			GFD, (0.1 - 0.5s) 0.3 (I^2t Out)	
F BHNB	CUTLER-HAMMER	1600A	Phase	3-36
Static Trip	Magnum DS, DT 1150/1150i	1200A	LTPU, (0.4 - 1 x In) 1.000 (1200A)	
	LSI, 800-6000AF	1200A	LTD-I2T, (2-24s) 11	
			STPU, (200-1200A SF) 4.000 (4800A)	
			STD-I2T, (0.1 - 0.5s) 0.1 (I^2t Out)	
			INST, (200-1200A STD) 10.00 (12000A)	
			Maint	
			ARMS 2.5x (3000A)	
			Ground	3-39
			GFPU, (1150i, 0.1 - 1) 0.3 (360A)	
			GFD, (0.1 - 0.5s) .15 (I^2t Out)	
F BLEQE	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-24
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 5 (2000A)	
	250-400A			
F DIST PNL R	CUTLER-HAMMER	800A	Thermal Curve (Fixed)	3-21
Thermal Magnetic	MDL	800A	INST (4-8 x Trip) 4 (3200A)	
	300-800A			

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
F LP2	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-24
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 5 (2000A)	
	250-400A			
F MP5C	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-24
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 5 (2000A)	
	250-400A			
F P1	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-25
Thermal Magnetic	DK	250A	INST (5-10 x Trip) 7.5 (1875A)	
	250-400A			
F PHEQA	CUTLER-HAMMER	600A	Thermal Curve (Fixed)	3-25
Thermal Magnetic	LG, Series G	600A	INST (5-10 x Trip) 5 (3000A)	
	250-600A, Fixed, UL			
F T 750 CAST	CUTLER-HAMMER	1600A	Phase	3-40
Static Trip	Magnum SB, DT 520	1600A	Ir, (0.4-1.0 x P) 1 (1600A)	
	LSI, 1600AF, 200-1600AP	1600A	LTD, (2 - 24 Sec.) 15	
			STPU, (2-10 x Ir) 6 (9600A)	
			STD, (0.1-0.5 Sec.) 0.4 (I^2t Out)	
			INST, (2-14 x P) 200-1200A M1 (22400A)	
			MMS	
			ARMS R5 (4000A)	
F T-1LCCB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-15
Thermal Magnetic	KD	350A	INST (5-10 x Trip) 7.5 (2625A)	
	100-400A			
F T-1LNB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-37
Thermal Magnetic	KD	350A	INST (5-10 x Trip) 10 (3500A)	
	100-400A			
F T-2LEQB	CUTLER-HAMMER	250A	Thermal Curve (Fixed)	3-28
Thermal Magnetic	JD	100A	INST (5-10 x Trip) 5 (500A)	
	70-250A			
F T-2LNB	CUTLER-HAMMER	250A	Thermal Curve (Fixed)	3-28
Thermal Magnetic	JD	100A	INST (5-10 x Trip) 10 (1000A)	
	70-250A			

Name/Type	Description	Frame/Sensor/Plug	Settings:	TCC#
F T-BLCCA	CUTLER-HAMMER	600A	Thermal Curve (Fixed)	3-16
Thermal Magnetic	LG, Series G	600A	INST (5-10 x Trip) 5 (3000A)	
	250-600A, Fixed, UL			
F T-BLCCB	CUTLER-HAMMER	600A	Thermal Curve (Fixed)	3-14
Thermal Magnetic	LG, Series G	600A	INST (5-10 x Trip) 5 (3000A)	
	250-600A, Fixed, UL			
F T-BLEQA	CUTLER-HAMMER	800A	Thermal Curve (Fixed)	3-24
Thermal Magnetic	HMDL	800A	INST (4-8 x Trip) 4 (3200A)	
	300-800A			
F T-BLLSA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-45
Thermal Magnetic	KD	350A	INST (5-10 x Trip) 7.5 (2625A)	
	100-400A			
F T-BLNA	CUTLER-HAMMER	800A	Thermal Curve (Fixed)	3-31
Thermal Magnetic	HMDL	800A	INST (4-8 x Trip) 5 (4000A)	
	300-800A			
F T-PLEQA	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-25
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 5 (2000A)	
	100-400A			
F UPS TEL RM	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-18
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 10 (4000A)	
	250-400A			
F5HNB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-36
Thermal Magnetic	KD	400A	INST (5-10 x Trip) 10 (4000A)	
	100-400A			
MP5C-1 MB	CUTLER-HAMMER	400A	Thermal Curve (Fixed)	3-24
Thermal Magnetic	DK	400A	INST (5-10 x Trip) 5 (2000A)	
	250-400A			

Table 4.2 - Recommended Medium-Voltage Protective Device Settings

Name/Type	Description	Settings:	TCC#
001-1 MAIN LOAD BUS #1	GE MULTILIN	Phase OC PU 1.33 (798A)	3-8
Electronic	750	Ext Inverse 1.8; 1 (S;M)	
	50/51, 5A CT		
002-1 MAIN LOAD BUS #2	GE MULTILIN	Phase OC PU 1.33 (798A)	3-9
Electronic	750	Ext Inverse 2; 1 (S;M)	
	50/51, 5A CT		
ATS 7 Relay Emerg	GE MULTILIN	Phase OC PU 0.25 (100A)	3-8
Electronic	750	Ext Inverse 3.1; 1 (S;M)	
	50/51, 5A CT		
ATS 7 Relay Normal	GE MULTILIN	Phase OC PU 0.25 (100A)	3-8
Electronic	750	Ext Inverse 5; 1 (S;M)	
	50/51, 5A CT		
G1 RELAY	GE MULTILIN	Phase OC PU 0.7 (420A)	3-12
Electronic	750	Ext Inverse 2; 1 (S;M)	
	50/51, 5A CT		
G2 RELAY	GE MULTILIN	Phase OC PU 1.33 (798A)	3-12
Electronic	750	Ext Inverse 2; 1 (S;M)	
	50/51, 5A CT		
G3 RELAY	GE MULTILIN	Phase OC PU 1.33 (798A)	3-12
Electronic	750	Ext Inverse 2; 1 (S;M)	
	50/51, 5A CT		
RLY F NORM PC 1	GE MULTILIN	Phase	3-8
Electronic	750	Phase OC PU 1 (600A)	
	50/51, 5A CT	Ext Inverse 1.5; 1 (S;M)	
		Phase Inst OC PU 6 (3600A)	
		Ground	
		Ground OC PU 0.2 (120A)	
		Ext Inverse 0.5; 1 (S;M)	
		Ground Inst OC PU 0.5 (300A)	

Name/Type	Description	Settings:	TCC#
RLY F NORM PC 2	GE MULTILIN	Phase	3-9
Electronic	750	Phase OC PU 1 (600A)	
	50/51, 5A CT	Ext Inverse 1.5; 1 (S;M)	
		Phase Inst OC PU 6 (3600A)	
		Ground	
		Ground OC PU 0.2 (120A)	
		Ext Inverse 0.5; 1 (S;M)	
		Ground Inst OC PU 0.5 (300A)	
TIE RELAY	GE MULTILIN	Phase OC PU 1.33 (798A)	3-8
Electronic	750	Ext Inverse 2; 1 (S;M)	
	50/51, 5A CT		

5.0 ARC FLASH HAZARD ANALYSIS

This section of the report contains the interpretation for the arc flash hazard analysis. The calculations made in this arc flash hazard analysis conform to NFPA 70E and are based on the information provided by the customer. Actual heat and radiation exposure may be more or less than reflected in the analysis.

Only qualified electricians who are familiar with the installation and maintenance of electrical distribution equipment should perform work associated with such products. All recommendations of the manufacturer, warnings and cautions relating to the safety of personnel and equipment should be followed. All applicable health and safety laws, codes, standards and procedures should be adhered to. All equipment should be de-energized prior to any maintenance or service. OSHA 1910.333 requirements should be adhered to. All guidelines of NFPA 70E-2009 should be followed, and in particular appropriate personal protective equipment must be provided and worn.

Eaton Corporation will not be responsible for the misuse or misapplication of the information contained in this analysis. Those providing service for electrical equipment should contact an Electrical Engineering Services and Systems representative, or other qualified individual, if any questions arise.

5.1 Introduction

NFPA 70E-2009, Article 110.7 (F) states that an electrical safety program shall identify a hazard/ risk evaluation procedure to be used before work is started on or near energized electrical conductors and circuit parts operating at 50 volts or more or where an electrical hazard exists. NFPA 70E-2009, Article 130.7 (A) states that employees working in areas where electrical hazards are present shall be provided with, and shall use, personal protective equipment (PPE) that is designed and constructed for the specific part of the body to be protected and for the work to be performed.

NFPA 70E and IEEE Std 1584-2002 provide equations and methods to accurately calculate the arc flash boundary and incident energy at specific locations within a facility's electrical system. These results are used to determine the safe approach distance, Hazard/ Risk Category, and personal protective equipment requirements for each location. Any location where work may be performed on or near energized electrical conductors and circuit parts is subject to the arc flash standards. Personal protective equipment used to guard against arc flash hazard should be considered the last line of defense. It is also important to note that the use of PPE is not intended to prevent all injuries from an arc flash. The goal of determining PPE levels using the arc flash hazard approach is to identify the level of protection

required to limit the injury to the onset of a second degree burn in the event of an arc flash while avoiding the use of more protection than is needed so as to minimize hazards of heat stress, reduced visibility and limited body movement.

Although the arc flash calculation procedure is based upon NFPA 70E and IEEE Std 1584-2002 equations and methods, it is a relatively new approach to determining the degree of required PPE. The calculations are derived from theory and research involving arc current incident energy measurements conducted under a specific set of controlled test conditions. Therefore, calculation results may be more severe or less severe than the hazard presented by an actual arc flash exposure. Also, the arc flash calculations do not take into account hazards associated with the splattering of molten metal, explosively propelled pieces of equipment and air pressure shock waves.

The results of this arc flash hazard analysis are not intended to imply that personnel be permitted to work on exposed energized equipment or circuits. OSHA 1910.333 restricts the situations in which work is to be performed near or on energized equipment or circuits by stating, “Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them, unless the employer can demonstrate that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations.”

Even if work is not being performed directly on energized equipment, it is important that the proper PPE be used during some load interruption actions, during visual verification of the state of disconnecting devices, and during lockout/tagout procedures.

Before the arc flash equations can be applied, a comprehensive short circuit and protective device coordination study must be completed to include all locations where work may be performed on or near energized components; e.g. motor control centers and power distribution panels. Since the short circuit current must be calculated at every pertinent location and the clearing time of each location’s upstream protective device is required, the arc flash circuit model is more detailed and extends deeper into the facility electrical distribution system than is typical of a basic short circuit and protective device coordination study. Accurate fault currents and device clearing times are extremely important in deriving reliable results. A conservative (high) fault current value could yield a faster clearing time of a protective device, depending upon its curve shape, and the calculated incident energy may actually be less than the incident energy calculated for a lower magnitude of fault current and a longer clearing time.

Since the greatest arc flash hazards may not result from the highest fault current, multiple scenarios must be analyzed and compared. The following modes of operation have been evaluated in order to determine the worst-

case incident energy at each location in the system. It is important to determine the available short-circuit current for modes of operation that provide both the maximum and minimum available short-circuit currents.

- Arc Flash Scenario 1 – 100% Fault Current, Motors ON
- Arc Flash Scenario 2 – 50% Fault Current, Motors OFF
- Arc Flash Scenario 3 – Generators ON, Motors ON
- Arc Flash Scenario 4 – Generators ON, Motors OFF

The analysis required energy and boundary calculations for approximately one-hundred fifty-seven (157) locations.

5.2 Study Procedure

In accordance with NFPA 70E and IEEE Std 1584-2002, SKM Systems Analysis software provides the calculation of these values. The equations used in these calculations are based on actual test values. These tests measured the calories per square centimeter (cal/cm^2) radiating from a simulated arcing fault. The measurements were performed at a theorized working distance of 18 inches.

The intent of the NFPA 70E and IEEE Std 1584-2002 guidelines is to establish standard calculations to determine an Approach Boundary and an associated Hazard/ Risk Category that will prevent the onset of a second-degree burn to the face and the torso of the worker. An incident energy of 1.2 cal/cm^2 represents the onset of a second-degree burn.

The various Hazard/ Risk Categories are described in the NFPA 70E standard on a scale of 0 to 4 and shown in Table 5.1. An incident energy greater than 40 cal/cm^2 will be described in this study as “DANGER” and no Hazard/ Risk Category can be applied. Thus, no PPE is approved to protect the worker from a potential arc flash hazard and the equipment enclosure should not be opened unless the equipment is de-energized, tagged-out, and locked-out.

Table 5.1 – Hazard/ Risk Categories

Minimum Calculated Incident Energy (cal/cm^2)	Maximum Calculated Incident Energy(cal/cm^2)	Hazard/ Risk Category (HRC)
0.0	1.2	0
> 1.2	4.0	1
> 4.0	8.0	2
> 8.0	25.0	3
> 25.0	40.0	4
Above 40.0	--	DANGER

The arc flash analysis considers each medium and low voltage system location within the scope of the work. IEEE Std 1584-2002 states that equipment below 240 V need not be considered unless it involves at least one 125 kVA or larger low-impedance transformer in its immediate power supply. Therefore, no detailed calculations will be performed for 120/208 V locations supplied by a transformer smaller than 125 kVA, however labels will be provided for these locations and will be labeled as Hazard/ Risk Category zero. These locations can be seen in Table 5.4.

Two calculations are typically provided for labels on locations where there is adequate separation between the line side terminals of the main protective device and the work location. The “Load Side” calculation provides the HRC based on the main protective device clearing in the event of an arc flash incident. If the work location or task is such that the main breaker may not trip in the event of an arc flash incident, then the “Line Side” calculation for HRC should be observed. This could occur if the main breaker is being racked-out and a fault occurred on the line terminals. For this case, the next upstream device is the one that must clear the fault.

One should always remember that the terms “Line Side” and “Load Side” are always in reference to the main protective device (see example below).

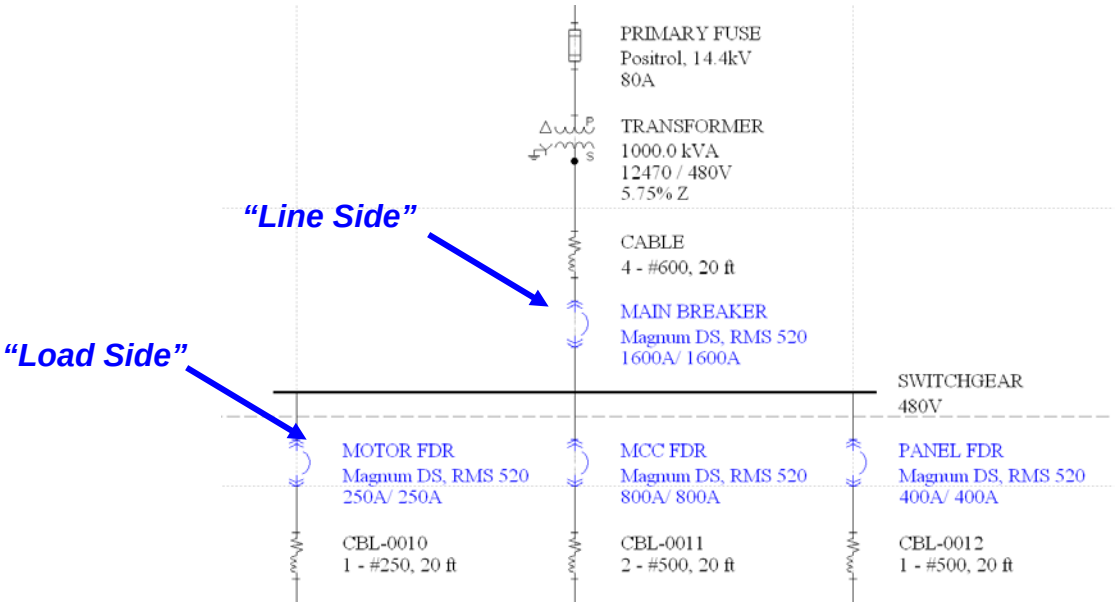


Figure 1: Line Side vs. Load Side

5.3 Arc Flash Hazard Analysis Results

The incident energy associated with an arc flash is dependent upon the following parameters:

- The maximum "bolted fault" three-phase short circuit current available at the equipment and the minimum fault level at which the arc will self-sustain.
- The total protective device clearing time (upstream of the prospective arc location) at the maximum short circuit current and the minimum fault level at which the arc will self-sustain.
- The distance of the worker from the prospective arc for the task to be performed.

The arc flash hazard analysis results shown in Table 5.2 and Table 5.3 are based on a protective device clearing time that is capped at 2 seconds. This is based on IEEE Std 1584-2002 which states in Annex B, Instructions and Examples; *"If the time is longer than two seconds, consider how long a person is likely to remain in the location of the arc flash. It is likely that a person exposed to an arc flash will move away quickly if it is physically possible and two seconds is a reasonable maximum time for calculations. A person in a bucket truck or a person who has crawled into equipment will need more time to move away."*

The fault current cannot easily be reduced nor can the working distance be easily increased to lessen the incident energy. In many locations the

protective device setting can be adjusted or the trip unit upgraded to decrease the device interrupting time that will in turn decrease the incident energy. For a critical electrical distribution system, such as for Louis A. Johnson VA Medical Center, Clarksburg WV, it is essential that the system reliability not be compromised. Settings for protective devices cannot be adjusted if the chance of nuisance trips within critical circuits is introduced. *Each location where the hazard is determined to be unacceptable by " Louis A. Johnson VA Medical Center, Clarksburg, WV" must be individually evaluated to determine the most effective means of reducing the incident energy while maintaining the highest degree of reliability.*

All of the adjustable protective devices listed in Section 4 must be set per the recommended settings of this study to achieve the arc flash Hazard/ Risk Category shown in Table 5.2 and Table 5.3.

5.4 Arc Flash Summary Table Heading Descriptions

Table 5.2 shows results of the SKM PowerTools arc flash hazard analysis. The following column headings describe the results.

Column #1 - Bus Name: The names in this column correlate to the names implemented in the software system model (reference the one-lines included in Appendix C) These locations correspond to plant locations such as main switchboards, panelboards, enclosed breakers, etc.

Column #2 - Protective Device Name: This column lists the name of the device primarily responsible for clearing a potential fault at the associated bus. Again, these device names correlate to the system model.

Column #3 - Bus kV: The values in this column show the nominal voltage of the bus location noted in Column #1.

Column #4 - Bus Bolted Fault (kA): This column shows the bolted fault current available for the bus location referenced in Column #1. This current value corresponds to the system operating conditions that will result in the worst-case calculated value for incident energy. (See Column # 14.)

Column #5 - Prot Dev Bolted Fault Current: This column displays the portion of calculated bolted fault currents (See Column #4) that is contributed through the protective device referenced in Column #2.

Column #6 - Prot Dev Arcing Fault (kA): This column displays the portion of calculated arcing fault currents that is contributed through the protective device referenced in Column #2. These values demonstrate a reduction in available fault current due to the arc resistance.

Column #7 - Trip/Delay Time (sec): This column displays the length of time required by the protective device (See Column #2) to trip in the presence of the arcing fault current calculated in Column #6. For low voltage breakers and fuses, this time represents the total clearing time of the device.

Column #8 - Gnd: This column indicates whether the fault location includes a path to ground. Systems with high-resistance or low-resistance grounds are assumed to be ungrounded in the arc flash calculations.

Column #9 - Equip Type: This column indicates whether the equipment is Switchgear, Panel, Cable or Open Air. The equipment type provides a default Gap value and a distance exponent used in the IEEE incident energy equations.

Column #10 – Gap (mm): This column displays the spacing between bus bars or conductors at the arc location.

Column #11 - Arc Flash Boundary (in): This column displays the distance within which a person must be clothed in the appropriate PPE (Personal Protection Equipment.) (See Column #15.)

Column #12 - Working Distance (in): This distance indicates the typical working distance associated with the system location referenced in Column #1.

Column #13 - Incident Energy (cal/cm^2): Based on the arcing fault current, the total clearing time of the protective device, the bus bar gap, the grounding method, and the typical working distance, the column displays the results of the arc flash calculations at the reference location. This energy level directly corresponds to the appropriate PPE described in the final column.

Column #14 – Hazard/ Risk Category: These categories are specified in NFPA 70E and correspond directly to the potential incident energy calculated for each location. *Refer to Table 5.1 and the NFPA 70E for suggested PPE (Personal Protective Equipment) for the Class ratings listed in Table 5.2, Table 5.3, and Table 5.4. Table 5.3 contains the "Disengaged" Hazard/ Risk Category as a reference only.*

5.5 Arc Flash Hazard Analysis Recommendations

1) All of the adjustable protective devices listed in Section 4 must be set per the recommended settings to achieve the arc flash class ratings listed in Table 5.2 and Table 5.3.

2) Each location where the arc flash hazard is unacceptable to "Louis A. Johnson VA Medical Center, Clarksburg, WV" should be individually

evaluated to determine the most effective means of reducing the incident energy while maintaining the highest degree of reliability.

Table 5.2 – Arc Flash Analysis Summary Table

Bus Name	Device Name	Bus kV	Bus Bolted Fault kA	Device Bolted Fault kA	Arcing Fault kA	Trip Time (s.)	Ground	Equip	Gap mm	AF Boundary	Working Distance (in.)	Incident Energy (cal/cm^2)	Hazard/ Risk Category
1 HNB	F 1HNB	0.480	14.11	14.11	8.8	0.014	Yes	PNL	25	9"	1' 6"	0.4	#0
1CA	F 1CA	0.208	1.99	1.99	1.4	2	Yes	PNL	25	4' 9"	1' 6"	7.9	#2
1CB	F 1CB	0.208	4.02	4.02	2.3	2	Yes	PNL	25	6' 6"	1' 6"	13.2	#3
1CC	F 1CC	0.208	2.27	2.27	1.54	0.01	Yes	PNL	25	2"	1' 6"	0.0	#0
1CD	F 1CB	0.208	3.82	3.82	2.21	2	Yes	PNL	25	6' 4"	1' 6"	12.7	#3
1HCCB	F 1HCCB	0.480	13.28	13.28	8.35	0.014	Yes	PNL	25	9"	1' 6"	0.4	#0
1HLSB	F 1HLSB	0.480	8.84	8.84	5.9	0.018	Yes	PNL	25	8"	1' 6"	0.3	#0
1LCCA	F 1LCCA	0.208	7.44	7.44	3.53	2	Yes	PNL	25	8' 8"	1' 6"	21.4	#3
1LCCB (Line Side)	F T-1LCCB	0.208	7.17	7.17	3.44	2	Yes	PNL	25	8' 7"	1' 6"	20.8	#3
1LCCC	F 1LCCC	0.208	2.78	2.78	1.77	2	Yes	PNL	25	5' 6"	1' 6"	10.2	#3
1LCCD	F 1LCCD	0.208	4.03	4.03	2.3	2	Yes	PNL	25	6' 7"	1' 6"	13.5	#3
1LCCE	F 1LCCD	0.208	3.93	3.93	2.26	2	Yes	PNL	25	6' 6"	1' 6"	13.2	#3
1LEQA	F 1LEQA	0.208	7.27	7.27	3.48	0.017	Yes	PNL	25	6"	1' 6"	0.2	#0
1LEQB	F 1LEQB	0.208	2.24	2.24	1.52	2	Yes	PNL	25	1' 6"	1' 6"	1.2	#0
1LLSA	F 1LLSA	0.208	4.09	4.09	2.32	2	Yes	PNL	25	6' 7"	1' 6"	13.7	#3
1LLSC	F 1LLSC	0.208	2.26	2.26	1.53	0.01	Yes	PNL	25	2"	1' 6"	0.0	#0
1LNA	F 1LNA	0.208	9.17	9.17	4.09	2	Yes	PNL	25	9' 4"	1' 6"	23.9	#3
1LNB (Line Side)	F T-1LNB	0.208	7.33	7.33	3.5	2	Yes	PNL	25	8' 8"	1' 6"	21.2	#3
1LNC	F 1LNC	0.208	3.18	3.18	1.95	1.792	Yes	PNL	25	5' 6"	1' 6"	10.1	#3

Bus Name	Device Name	Bus kV	Bus Bolted Fault kA	Device Bolted Fault kA	Arcing Fault kA	Trip Time (s.)	Ground	Equip	Gap mm	AF Boundary	Working Distance (in.)	Incident Energy (cal/cm^2)	Hazard/ Risk Category
1WC	F 1WC	0.208	3.73	3.73	2.18	2	Yes	PNL	25	6' 3"	1' 6"	12.5	#3
2HEQA	F 2HEQA	0.480	10.4	10.4	6.78	0.012	Yes	PNL	25	7"	1' 6"	0.3	#0
2HEQB	F 2HEQB	0.480	12.71	12.71	8.05	0.011	Yes	PNL	25	8"	1' 6"	0.3	#0
2HNA	F 2HNA	0.480	7.52	7.52	4.37	2	Yes	PNL	25	7' 9"	1' 6"	17.8	#3
2HNB	F 2HNB	0.480	13.39	13.39	8.42	0.011	Yes	PNL	25	8"	1' 6"	0.3	#0
2LCCA	F 1LCCA	0.208	7.18	7.18	3.45	2	Yes	PNL	25	8' 7"	1' 6"	20.8	#3
2LCCB	F 2LCCB	0.208	6.74	6.74	3.3	2	Yes	PNL	25	8' 4"	1' 6"	19.9	#3
2LCCC	F 2LCCC	0.208	3.79	3.79	2.2	2	Yes	PNL	25	6' 5"	1' 6"	12.9	#3
2LCCD	F 2LCCD	0.208	3.65	3.65	1.82	2	Yes	PNL	25	5' 8"	1' 6"	10.5	#3
2LCCE	F 2LCCE	0.208	3.42	3.42	2.05	0.018	Yes	PNL	25	4"	1' 6"	0.1	#0
2LCCF	F 2LCCF	0.208	3.42	3.42	2.05	0.018	Yes	PNL	25	4"	1' 6"	0.1	#0
2LEQA	F 2LEQA	0.208	6.82	6.82	3.33	0.01	Yes	PNL	25	4"	1' 6"	0.1	#0
2LLSA	F 1LLSA	0.208	3.89	3.89	2.24	2	Yes	PNL	25	6' 6"	1' 6"	13.2	#3
2LLSC	F 2LLSC	0.208	1.96	1.96	1.18	2	Yes	PNL	25	4' 3"	1' 6"	6.6	#2
2LNA	F 1LNA	0.208	8.77	8.77	3.97	2	Yes	PNL	25	9' 2"	1' 6"	23.1	#3
3A EM	F 3A EM	0.208	2.5	2.5	1.64	0.01	Yes	PNL	25	3"	1' 6"	0.1	#0
3A1	F 3A1	0.208	3.86	3.86	2.23	2	Yes	PNL	25	6' 5"	1' 6"	13.1	#3
3HCCB	F 3HCCB	0.480	12.05	12.05	7.69	0.016	Yes	PNL	25	9"	1' 6"	0.4	#0
3HLSB	F 3HLSB	0.480	7.49	7.49	5.12	0.015	Yes	PNL	25	7"	1' 6"	0.2	#0
3HNB	F 3HNB	0.480	12.74	12.74	8.07	0.014	Yes	PNL	25	9"	1' 6"	0.4	#0
3LCCA	F 3LCCA	0.208	5.93	5.93	3.02	2	Yes	PNL	25	7' 10"	1' 6"	18.1	#3

Bus Name	Device Name	Bus kV	Bus Bolted Fault kA	Device Bolted Fault kA	Arcing Fault kA	Trip Time (s.)	Ground	Equip	Gap mm	AF Boundary	Working Distance (in.)	Incident Energy (cal/cm^2)	Hazard/ Risk Category
3LCCC	F 3LCCC	0.208	4.1	4.1	1.98	1.731	Yes	PNL	25	5' 5"	1' 6"	9.9	#3
3LEQA	F 3LEQA	0.208	6.82	6.82	3.33	0.018	Yes	PNL	25	6"	1' 6"	0.2	#0
3LEQB	F 3LEQB	0.208	2.22	2.22	1.51	2	Yes	PNL	25	1' 6"	1' 6"	1.2	#0
3LLSA	F 3LLSA	0.208	3.89	3.89	2.24	2	Yes	PNL	25	6' 6"	1' 6"	13.2	#3
3LLSC	F 3LLSC	0.208	1.91	1.91	1.16	2	Yes	PNL	25	4' 2"	1' 6"	6.4	#2
3LNA	F 3LNA	0.208	6.73	6.73	3.29	2	Yes	PNL	25	8' 2"	1' 6"	19.2	#3
3LNC	F 3LNC	0.208	4.49	4.49	2.48	2	Yes	PNL	25	6' 10"	1' 6"	14.3	#3
4AD	4C MB	0.208	3.95	3.95	1.93	1.839	Yes	PNL	25	5' 7"	1' 6"	10.2	#3
4C (Line Side)	F 4C	0.208	3.99	3.99	2.28	2	Yes	PNL	25	6' 6"	1' 6"	13.4	#3
4DP	F 4DP	0.208	3.6	3.6	2.12	2	Yes	PNL	25	6' 3"	1' 6"	12.4	#3
4EML	F 4EML	0.208	3.35	3.35	1.72	2	Yes	PNL	25	5' 5"	1' 6"	9.9	#3
4HEQA	F 4HEQA	0.480	9.79	9.79	6.44	0.012	Yes	PNL	25	7"	1' 6"	0.3	#0
4HEQB	F 4HEQB	0.480	11.85	11.85	7.58	0.011	Yes	PNL	25	7"	1' 6"	0.3	#0
4HNA	F 4HNA	0.480	6.84	6.84	4.03	2	Yes	PNL	25	9' 5"	1' 6"	24.4	#3
4HNB	F 4HNB	0.480	12.15	12.15	7.75	0.015	Yes	PNL	25	9"	1' 6"	0.4	#0
4L	F 4L	0.208	3.49	3.49	2.08	2	Yes	PNL	25	6' 2"	1' 6"	12.1	#3
4LA	F 4LA	0.208	3.48	3.48	1.76	2	Yes	PNL	25	5' 6"	1' 6"	10.1	#3
4LCCA	F 3LCCA	0.208	5.63	5.63	2.91	2	Yes	PNL	25	7' 8"	1' 6"	17.4	#3
4LEQA	F 3LEQA	0.208	6.43	6.43	2.71	0.022	Yes	PNL	25	6"	1' 6"	0.2	#0
4LEQC	F 4LEQC	0.208	4.03	4.03	2.3	0.019	Yes	PNL	25	5"	1' 6"	0.1	#0
4LLSA	F 3LLSA	0.208	3.71	3.71	2.17	2	Yes	PNL	25	6' 4"	1' 6"	12.7	#3

Bus Name	Device Name	Bus kV	Bus Bolted Fault kA	Device Bolted Fault kA	Arcing Fault kA	Trip Time (s.)	Ground	Equip	Gap mm	AF Boundary	Working Distance (in.)	Incident Energy (cal/cm^2)	Hazard/ Risk Category
4LLSC	F 4LLSC	0.208	2.19	2.19	1.5	0.01	Yes	PNL	25	2"	1' 6"	0.0	#0
4LNA	F 3LNA	0.208	6.35	6.35	3.16	2	Yes	PNL	25	7' 11"	1' 6"	18.4	#3
4LNC	F 4LNC	0.208	3.23	3.23	1.97	1.745	Yes	PNL	25	5' 5"	1' 6"	9.8	#3
5HCCB	F 5HCCB	0.480	10.73	10.73	6.97	0.017	Yes	PNL	25	9"	1' 6"	0.4	#0
5HLSB	F 5HLSB	0.480	6.53	6.53	4.56	0.015	Yes	PNL	25	6"	1' 6"	0.2	#0
5HNB	F5HNB	0.480	8.14	8.14	4.68	0.027	Yes	PNL	25	9"	1' 6"	0.4	#0
5LCCA	F 5LCCA	0.208	5.56	5.56	2.88	2	Yes	PNL	25	7' 7"	1' 6"	17.2	#3
5LEQA	F 5LEQA	0.208	6.33	6.33	2.68	0.023	Yes	PNL	25	6"	1' 6"	0.2	#0
5LEQB	F 5LEQB	0.208	2.21	2.21	1.51	2	Yes	PNL	25	1' 6"	1' 6"	1.2	#0
5LLSA	F 5LLSA	0.208	3.71	3.71	2.17	2	Yes	PNL	25	6' 4"	1' 6"	12.7	#3
5LNA	F 5LNA	0.208	6.26	6.26	3.13	2	Yes	PNL	25	7' 11"	1' 6"	18.2	#3
6HEQA	F 6HEQA	0.480	9.35	9.35	6.19	0.012	Yes	PNL	25	7"	1' 6"	0.2	#0
6HEQB	F 6HEQB	0.480	10.58	10.58	6.88	0.012	Yes	PNL	25	7"	1' 6"	0.3	#0
6HNA	F 6HNA	0.480	7.11	7.11	4.17	2	Yes	PNL	25	7' 8"	1' 6"	17.3	#3
6HNB	F 6HNB	0.480	7.9	7.9	4.56	0.029	Yes	PNL	25	9"	1' 6"	0.4	#0
6LCCA	F 5LCCA	0.208	5.3	5.3	2.78	2	Yes	PNL	25	7' 5"	1' 6"	16.6	#3
6LCCB	F 6LCCB	0.208	3.81	3.81	2.21	1.914	Yes	PNL	25	1' 6"	1' 6"	1.2	#0
6LEQA	F 5LEQA	0.208	5.99	5.99	2.58	0.026	Yes	PNL	25	6"	1' 6"	0.2	#0
6LLSA	F 5LLSA	0.208	3.54	3.54	2.1	2	Yes	PNL	25	6' 2"	1' 6"	12.3	#3
6LNA	F 5LNA	0.208	5.92	5.92	3.01	2	Yes	PNL	25	7' 8"	1' 6"	17.5	#3
7-1LNA (Line Side)	T-3 Pri Fuse	0.208	11.81	11.81	4.15	1.866	Yes	PNL	25	9' 4"	1' 6"	23.8	#3

Bus Name	Device Name	Bus kV	Bus Bolted Fault kA	Device Bolted Fault kA	Arcing Fault kA	Trip Time (s.)	Ground	Equip	Gap mm	AF Boundary	Working Distance (in.)	Incident Energy (cal/cm^2)	Hazard/ Risk Category
7-1LNB (Line Side)	T-3 Pri Fuse	0.208	8.19	8.19	3.78	2	Yes	PNL	25	9' 2"	1' 6"	23.1	#3
7-1NLC	F 7-1LNC	0.208	5.97	5.97	3.03	2	Yes	PNL	25	7' 11"	1' 6"	18.2	#3
ATS 7 Load Side	FUSE UTIL 2	4.16	4.47	4.47	4.4	0.369	Yes	PNL	25	5' 7"	3'	2.2	#1
BHCCA (Line Side)	F BHCCA	0.480	13.81	13.81	8.64	0.2	Yes	PNL	25	3' 10"	1' 6"	5.5	#2
BHCCB (Line Side)	F BHCCB	0.480	14.58	14.58	9.05	0.2	Yes	PNL	25	3' 11"	1' 6"	5.8	#2
BHEQA (Line Side)	F BHEQA	0.480	14.04	13.17	8.22	0.2	Yes	SWG	104	3' 10"	1' 6"	5.6	#2
BHEQB (Line Side)	F BHEQB	0.480	14.45	14.45	8.98	0.2	Yes	PNL	25	3' 11"	1' 6"	5.8	#2
BHLSA (Line Side)	F BHLSA	0.480	8.01	8.01	4.61	0.028	Yes	PNL	25	9"	1' 6"	0.4	#0
BHLSB (Line Side)	F BHLSB	0.480	9.41	9.41	6.23	0.017	Yes	PNL	25	8"	1' 6"	0.4	#0
BHNA (Line Side)	F BHNA	0.480	9.51	8.92	5.89	2	Yes	PNL	25	9' 5"	1' 6"	24.3	#3
BHNB (Line Side)	F BHNB	0.480	14.9	14.9	9.22	0.131	Yes	PNL	25	3' 1"	1' 6"	3.9	#1
BLCCA (Line Side)	F T-BLCCA	0.208	9.83	9.83	4.3	2	Yes	PNL	25	9' 11"	1' 6"	26.4	#4
BLCCB (Line Side)	F T-BLCCB	0.208	9.95	9.95	4.34	2	Yes	PNL	25	9' 11"	1' 6"	26.6	#4
BLCCC	F BLCCC	0.208	2.47	2.47	1.38	2	Yes	PNL	25	4' 9"	1' 6"	7.8	#2
BLCCD	F BLCCD	0.208	6.48	6.48	3.21	0.017	Yes	PNL	25	5"	1' 6"	0.2	#0
BLCCE	F BLCCE	0.208	4.23	4.23	2.38	0.018	Yes	PNL	25	5"	1' 6"	0.1	#0
BLEQA (Line Side)	F T-BLEQA	0.208	12.3	12.3	5.03	2	Yes	PNL	25	10' 11"	1' 6"	31.0	#4
BLEQC	F BLEQC	0.208	2.96	2.96	1.85	2	Yes	PNL	25	5' 8"	1' 6"	10.7	#3
BLEQD	F BLEQC	0.208	2.85	2.85	1.8	2	Yes	PNL	25	5' 7"	1' 6"	10.4	#3
BLEQE	F BLEQE	0.208	6.93	6.93	3.36	0.018	Yes	PNL	25	6"	1' 6"	0.2	#0
BLEQF	F BLEQE	0.208	6.41	6.41	2.71	0.022	Yes	PNL	25	6"	1' 6"	0.2	#0

Bus Name	Device Name	Bus kV	Bus Bolted Fault kA	Device Bolted Fault kA	Arcing Fault kA	Trip Time (s.)	Ground	Equip	Gap mm	AF Boundary	Working Distance (in.)	Incident Energy (cal/cm^2)	Hazard/ Risk Category
BLEQG	F BLEQG	0.208	5.91	5.91	3.01	0.015	Yes	PNL	25	5"	1' 6"	0.1	#0
BLEQH	F BLEQH	0.208	7.79	7.79	3.65	0.013	Yes	PNL	25	5"	1' 6"	0.2	#0
BLEQI	F BLEQH	0.208	7.1	7.1	3.42	0.014	Yes	PNL	25	5"	1' 6"	0.1	#0
BLEQJ	F BLEQJ	0.208	2.65	2.65	1.71	2	Yes	PNL	25	1' 6"	1' 6"	1.2	#0
BLLSA (Line Side)	F T-BLLSA	0.208	6.36	6.36	3.17	2	Yes	PNL	25	8' 1"	1' 6"	19.1	#3
BLLSC	F BLLSC	0.208	1.87	1.87	1.14	2	Yes	PNL	25	4' 2"	1' 6"	6.3	#2
BLLSD	F BLLSD	0.208	4.68	4.68	2.55	0.01	Yes	PNL	25	3"	1' 6"	0.1	#0
BLLSE	F BLLSE	0.208	3.6	3.6	2.12	0.01	Yes	PNL	25	3"	1' 6"	0.1	#0
BLLSF	F BLLSF	0.208	3.75	3.75	2.19	2	Yes	PNL	25	6' 4"	1' 6"	12.8	#3
BLNA (Line Side)	BKR BHNA	0.208	13.76	12.28	4.86	2	Yes	PNL	25	11'	1' 6"	31.6	#4
BLNC	F BLNC	0.208	3.76	3.76	2.19	2	Yes	PNL	25	6' 4"	1' 6"	12.6	#3
BLND	F BLND	0.208	9.15	9.15	3.47	1.08	Yes	PNL	25	5' 9"	1' 6"	10.7	#3
BLNE	F BLNE	0.208	5.26	5.26	2.77	2	Yes	PNL	25	7' 4"	1' 6"	16.1	#3
BLNF	F BLNF	0.208	3.44	3.44	1.75	2	Yes	PNL	25	5' 6"	1' 6"	10.1	#3
DIST PNL R Bsm't (Line Side)	F DIST PNL R	0.208	7.49	7.49	3.55	2	Yes	PNL	25	8' 9"	1' 6"	21.5	#3
EMER RM 360	F EMER RM 360	0.208	2.6	2.6	1.69	2	Yes	PNL	25	1' 6"	1' 6"	1.2	#0
EQSWBD (Line Side)	F ATS-EQ EMERG	0.480	16.57	15.72	9.58	2	Yes	PNL	25	11' 6"	1' 6"	33.7	#4
EQUIP RM 372	F EQUIP RM 372	0.208	1.6	1.6	1.02	2	Yes	PNL	25	1' 6"	1' 6"	1.2	#0
LSS 1	RLY F NORM PC 1	4.16	3.47	3.47	3.43	0.3	Yes	SWG	104	4' 6"	3'	1.8	#1
LSS 2	RLY F NORM PC 2	4.16	3.61	3.45	3.4	0.303	Yes	SWG	104	4' 6"	3'	1.8	#1

Bus Name	Device Name	Bus kV	Bus Bolted Fault kA	Device Bolted Fault kA	Arcing Fault kA	Trip Time (s.)	Ground	Equip	Gap mm	AF Boundary	Working Distance (in.)	Incident Energy (cal/cm^2)	Hazard/ Risk Category
LSSWBD	BKR LSSWBD	0.480	17.01	17.01	10.32	0.028	Yes	PNL	25	1' 4"	1' 6"	1.0	#0
LSSWBD (Line Side)	F ATS-LS EMERG	0.480	16.23	16.23	9.92	0.218	Yes	PNL	25	4'	1' 6"	6.1	#2
LVA-A (Line Side)	F T 1500 A	0.480	17.88	17.03	9.73	2	Yes	SWG	32	22' 1"	2'	41.1	DANGER
LVA-B (Line Side)	F T 1500 B	0.480	17.79	17.21	9.84	2	Yes	SWG	32	22' 2"	2'	41.4	DANGER
MP5C-1 (Line Side)	F MP5C	0.208	4.44	4.44	2.09	2	Yes	PNL	25	6' 2"	1' 6"	12.1	#3
MP5C-2	MP5C-1 MB	0.208	4.39	4.39	2.07	2	Yes	PNL	25	6' 2"	1' 6"	12.0	#3
MVS 1	RLY F NORM PC 2	4.16	3.61	3.51	3.47	0.303	No	SWG	104	4' 6"	3'	1.8	#1
MVS 2	RLY F NORM PC 2	4.16	3.61	3.54	3.5	0.303	No	SWG	104	4' 6"	3'	1.8	#1
PHEQA	F PHEQA	0.480	11.31	10.43	6.72	0.049	Yes	PNL	25	1' 6"	1' 6"	1.2	#1
PLEQA (Line Side)	F T-PLEQA	0.208	8.68	5.92	2.69	2	Yes	PNL	25	7' 11"	1' 6"	18.4	#3
PLNA	F PLNA	0.208	4.77	4.77	2.59	2	Yes	PNL	25	7'	1' 6"	15.0	#3
PNL A	F PNL A	0.208	2.48	2.48	1.63	0.01	Yes	PNL	25	2"	1' 6"	0.1	#0
PNL B	F PANEL B	0.208	6.36	6.36	3.16	0.014	Yes	PNL	25	5"	1' 6"	0.1	#0
PNL BIO MED	F PNL BIO MED	0.208	1.74	1.74	1.08	2	Yes	PNL	25	1' 6"	1' 6"	1.2	#0
PNL L	F PNL L	0.208	2.62	2.62	1.7	0.01	Yes	PNL	25	3"	1' 6"	0.1	#0
PNL R 1st	F PNL R	0.208	2.62	2.62	1.7	0.01	Yes	PNL	25	3"	1' 6"	0.1	#0
PNL UTIL SHOP 1 (Line Side)	F PNL UTIL SHOP	0.208	5.8	5.8	2.97	0.015	Yes	PNL	25	5"	1' 6"	0.1	#0
PNL UTIL SHOP 2 (Line Side)	F PNL UTIL SHOP	0.208	3.7	3.7	1.84	0.024	Yes	PNL	25	5"	1' 6"	0.1	#0
PNL UTIL SHOP 3	F PNL UTIL SHOP	0.208	3.44	3.44	1.75	0.027	Yes	PNL	25	5"	1' 6"	0.1	#0

Bus Name	Device Name	Bus kV	Bus Bolted Fault kA	Device Bolted Fault kA	Arcing Fault kA	Trip Time (s.)	Ground	Equip	Gap mm	AF Boundary	Working Distance (in.)	Incident Energy (cal/cm^2)	Hazard/ Risk Category
RP5L	F RP5L	0.208	2.51	2.51	1.65	0.01	Yes	PNL	25	3"	1' 6"	0.1	#0
RP6L	F RP6L	0.208	2.31	2.31	1.55	0.01	Yes	PNL	25	2"	1' 6"	0.0	#0
RP6R (Line Side)	F RP6R	0.208	2.62	2.62	1.7	2	Yes	PNL	25	1' 6"	1' 6"	1.2	#0
SWGR 1 (Line Side)	UTIL #1 XFMR FUSE	4.16	3.53	3.53	3.48	0.532	No	SWG	104	6' 4"	3'	2.5	#1
SWGR 2	FUSE UTIL 2	4.16	3.66	3.5	3.46	0.54	No	SWG	104	6' 6"	3'	2.5	#1
SWGR 2 (Line Side)	FUSE UTIL 2	4.16	3.66	3.5	3.46	0.54	No	SWG	104	6' 6"	3'	2.5	#1
SWGR PARALLEL	BKR GEN LV 1 LOC	0.480	16.92	7.96	4.59	2	Yes	SWG	32	13' 11"	2'	20.8	#3
T 750 CAST PRI	F T 750 CAST	0.480	15.9	15.75	9.66	2	Yes	PNL	25	11' 6"	1' 6"	33.7	#4
T 750 CAST SEC	F T 750 CAST	0.208	19.31	18.98	6.79	2	Yes	PNL	25	11'	1' 6"	31.3	#4

Table 5.3 – Arc Flash Analysis Summary Table

(Arcflash Reduction Maintenance Switch Engaged)

Bus Name	Device Name	Bus kV	Bus Bolted Fault kA	Device Bolted Fault kA	Arcing Fault kA	Trip Time (s.)	Ground	Equip	Gap mm	AF Boundary	Working Distance (in.)	Incident Energy (cal/cm^2)
2HNA(A.R.M.S.)	F BHNA	0.480	7.52	7.05	4.1	0.04	Yes	PNL	25	1'	1' 6"	0.6
4HNA(A.R.M.S.)	F BHNA	0.480	6.84	6.84	4.03	0.04	Yes	PNL	25	11"	1' 6"	0.5
6HNA(A.R.M.S.)	F BHNA	0.480	7.11	6.67	3.91	0.04	Yes	PNL	25	11"	1' 6"	0.6
BHCCA (Line Side)(A.R.M.S.)	F ATS-CC NORM	0.480	13.81	13.81	8.64	0.04	Yes	PNL	25	1' 5"	1' 6"	1.1
BHCCB (Line Side)(A.R.M.S.)	F ATS-CC NORM	0.480	14.58	14.58	9.05	0.04	Yes	PNL	25	1' 6"	1' 6"	1.2
BHEQA (Line Side)(A.R.M.S.)	F ATS-EQ NORM	0.480	14.04	13.17	8.22	0.04	Yes	PNL	25	1' 6"	1' 6"	1.3
BHEQB (Line Side)(A.R.M.S.)	F ATS-EQ NORM	0.480	14.45	14.45	8.98	0.04	Yes	PNL	25	1' 6"	1' 6"	1.2
BHNA (Line Side)(A.R.M.S.)	F BHNA	0.480	14.57	13.98	8.68	0.04	Yes	PNL	25	1' 7"	1' 6"	1.3

*In order to achieve the hazard risk shown in table 5.3 both the emergency and normal power breakers upstream of the ATS's must be placed in arc flash maintenance reduction mode.

Table 5.4 – Arc Flash summary for 240 V or less locations fed by smaller than 125 kVA transformer

Bus Name	Hazard / Risk Category (HRC)
19-1 LEQA	Category 0
19-1-LNA	Category 0
1LLSB	Category 0
2LEQB	Category 0
2LNB	Category 0
3LCCB	Category 0
3LLSB	Category 0
3LNB	Category 0
4LEQB	Category 0
4LNB	Category 0
5LCCB	Category 0
5LLSB	Category 0
5LNB	Category 0
6LEQB	Category 0
6LNB	Category 0
BLEQB	Category 0

Note: Based on IEEE Std 1584-2002, equipment below 240 V need not be considered in arc flash calculations unless it involves at least one 125 kVA or larger low-impedance transformer in its immediate power supply.

A. APPENDIX A – SHORT-CIRCUIT INPUT REPORT

Input Report Interpretation

Input Data Tables are provided on the following pages. The following is a guide for interpreting the input data.

1. Generation Contribution Data

   - Utility contribution data includes the available fault current in MVA and amps, per unit impedance on a 100 MVA base, X/R, and the line-to-line bus voltage.

   - Generator data includes the generator kW rating, X"d, X/R, line-to-line voltage, and per unit impedance on a 100 MVA base.

2. Motor Contribution Data

Motor Contribution Data includes the horsepower rating (base kVA rating), speed, subtransient reactance adjusted per the *First Cycle Duty* multipliers described in IEEE Std 141-1993 (Red Book), per-unit impedance on a 100 MVA base, and the bus voltage. X/R ratios for induction motors are obtained from IEEE Std C37.010-1999.

3. Feeder Data

Feeder data includes the following cable and bus data: length, impedance in ohms per 1,000 feet, and per-unit impedance on a 100 MVA base. Impedance values for conductors were obtained from Tables 4A-7 and 4A-8 of IEEE Std 141-1993 (Red Book). The impedance values are based on conductor temperatures of 75°C for copper and 90°C for Aluminum.

4. Transformer Data

Transformer data includes the transformer kVA rating and per-unit impedance on a 100 MVA base. Unless otherwise provided, transformer X/R ratios are obtained from IEEE Std C37.010-1999. Typical design impedances published by Eaton were used to model the Cutler-Hammer dry-type transformers.

Short-Circuit Input Report

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VA Clarksburg
Utility Contribution

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FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH	SIZE	TYPE
CBL-0001	BUS-0002	SWGR 1	1	4160	100.0 FEET	500	Copper
	Duct Material: Magnetic	: 0.0300 + J 0.0526 Ohms/1000 ft			0.0173 + J 0.0304 PU		
	Z0 Impedance: 0.0945 + J 0.1295 Ohms/1000 ft				0.0546 + J 0.0749 PU		
CBL-0002	BUS-0004	SWGR 2	1	4160	100.0 FEET	500	Copper
	Duct Material: Magnetic	: 0.0300 + J 0.0526 Ohms/1000 ft			0.0173 + J 0.0304 PU		
	Z0 Impedance: 0.0945 + J 0.1295 Ohms/1000 ft				0.0546 + J 0.0749 PU		
CBL-0006	SWGR 1	LSS 1	1	4160	200.0 FEET	500	Copper
	Duct Material: Magnetic	Insulation Type: XLPE			Insulation Class: 100%		
	+/- Impedance: 0.0290 + J 0.0492 Ohms/1000 ft				0.0335 + J 0.0569 PU		
	Z0 Impedance: 0.1602 + J 0.1367 Ohms/1000 ft				0.1851 + J 0.1580 PU		
CBL-0007	MVS 2	LSS 1	1	4160	1.000 FEET	500	Copper
	Duct Material: Non-Magnetic						
	+/- Impedance: 0.0276 + J 0.0373 Ohms/1000 ft				0.00016 + J 0.00022 PU		
	Z0 Impedance: 0.0438 + J 0.0999 Ohms/1000 ft				0.00025 + J 0.00058 PU		
CBL-0008	LSS 1	MVS 1	1	4160	1.000 FEET	500	Copper
	Duct Material: Non-Magnetic						
	+/- Impedance: 0.0276 + J 0.0373 Ohms/1000 ft				0.00016 + J 0.00022 PU		
	Z0 Impedance: 0.0438 + J 0.0999 Ohms/1000 ft				0.00025 + J 0.00058 PU		
CBL-0009	LSS 2	MVS 1	1	4160	1.000 FEET	500	Copper
	Duct Material: Non-Magnetic						
	+/- Impedance: 0.0276 + J 0.0373 Ohms/1000 ft				0.00016 + J 0.00022 PU		
	Z0 Impedance: 0.0438 + J 0.0999 Ohms/1000 ft				0.00025 + J 0.00058 PU		
CBL-0012	LVA-B	LVA-A	1	480	1.000 FEET	3200	Copper
	Duct Material: Busway						
	+/- Impedance: 0.0047 + J 0.0026 Ohms/1000 ft				0.0020 + J 0.0011 PU		
	Z0 Impedance: 0.1175 + J 0.0650 Ohms/1000 ft				0.0510 + J 0.0282 PU		
CBL-0013	SWGR 2	LSS 2	1	4160	200.0 FEET	500	Copper
	Duct Material: Magnetic	Insulation Type: XLPE			Insulation Class: 100%		
	+/- Impedance: 0.0290 + J 0.0492 Ohms/1000 ft				0.0335 + J 0.0569 PU		
	Z0 Impedance: 0.1602 + J 0.1367 Ohms/1000 ft				0.1851 + J 0.1580 PU		
CBL-0015	LSS 2	MVS 2	1	4160	1.000 FEET	500	Copper
	Duct Material: Non-Magnetic						
	+/- Impedance: 0.0276 + J 0.0373 Ohms/1000 ft				0.00016 + J 0.00022 PU		
	Z0 Impedance: 0.0438 + J 0.0999 Ohms/1000 ft				0.00025 + J 0.00058 PU		

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE
CBL-0019	LVA-A	BUS-0017	5	480	20.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466			Ohms/1000 ft		0.0510 + J 0.0809 PU		
	Z0 Impedance: 0.0926 + J 0.1147			Ohms/1000 ft		0.1608 + J 0.1991 PU		
CBL-0020	ATS CC	CCSWBD	5	480	20.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466			Ohms/1000 ft		0.0510 + J 0.0809 PU		
	Z0 Impedance: 0.0926 + J 0.1147			Ohms/1000 ft		0.1608 + J 0.1991 PU		
CBL-0021	SWGR PARALLEL	BUS-0019	4	480	20.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491			Ohms/1000 ft		0.0820 + J 0.1066 PU		
	Z0 Impedance: 0.1191 + J 0.1209			Ohms/1000 ft		0.2585 + J 0.2624 PU		
CBL-0022	BUS GEN LV 1	SWGR PARALLEL	5	480	20.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466			Ohms/1000 ft		0.0510 + J 0.0809 PU		
	Z0 Impedance: 0.0926 + J 0.1147			Ohms/1000 ft		0.1608 + J 0.1991 PU		
CBL-0023	BUS GEN LV 2	SWGR PARALLEL	5	480	20.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466			Ohms/1000 ft		0.0510 + J 0.0809 PU		
	Z0 Impedance: 0.0926 + J 0.1147			Ohms/1000 ft		0.1608 + J 0.1991 PU		
CBL-0024	LVA-A	BUS-0023	5	480	20.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466			Ohms/1000 ft		0.0510 + J 0.0809 PU		
	Z0 Impedance: 0.0926 + J 0.1147			Ohms/1000 ft		0.1608 + J 0.1991 PU		
CBL-0025	ATS EQ	EQSWBD	5	480	20.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466			Ohms/1000 ft		0.0510 + J 0.0809 PU		
	Z0 Impedance: 0.0926 + J 0.1147			Ohms/1000 ft		0.1608 + J 0.1991 PU		
CBL-0026	SWGR PARALLEL	BUS-0025	5	480	20.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466			Ohms/1000 ft		0.0510 + J 0.0809 PU		
	Z0 Impedance: 0.0926 + J 0.1147			Ohms/1000 ft		0.1608 + J 0.1991 PU		
CBL-0027	LVA-B	BUS-0026	3	480	20.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491			Ohms/1000 ft		0.1094 + J 0.1421 PU		
	Z0 Impedance: 0.1191 + J 0.1209			Ohms/1000 ft		0.3446 + J 0.3498 PU		

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE
CBL-0028	ATS LS	LSSWBD	3	480	20.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						0.1094 + J 0.1421 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						0.3446 + J 0.3498 PU	
CBL-0029	SWGR PARALLEL	BUS-0028	3	480	20.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						0.1094 + J 0.1421 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						0.3446 + J 0.3498 PU	
CBL-0030	SWGR PARALLEL	T 750 CAST PRI	5	480	20.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						0.0510 + J 0.0809 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						0.1608 + J 0.1991 PU	
CBL-0031	T 750 CAST SEC	SWBD X EMERG D	1	208	1.000	FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft				0.00023 + J 0.00023 PU	
	Z0 Impedance: 0.00010 + J 0.00010 Ohms/1000 ft						0.00023 + J 0.00023 PU	
CBL-0032	LVA-B	T 19-1 LNA	1	480	20.0	FEET	4	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.3210 + J 0.0632 Ohms/1000 ft						2.79 + J 0.5486 PU	
	Z0 Impedance: 1.01 + J 0.1556 Ohms/1000 ft						8.78 + J 1.35 PU	
CBL-0033	EQSWBD	T 19-1 LEQA	1	480	20.0	FEET	8	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.8110 + J 0.0754 Ohms/1000 ft						7.04 + J 0.6545 PU	
	Z0 Impedance: 2.56 + J 0.1856 Ohms/1000 ft						22.19 + J 1.61 PU	
CBL-0034	LVA-B	BHNA	4	480	270.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						1.11 + J 1.44 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						3.49 + J 3.54 PU	
CBL-0035	LVA-B	BHNB	4	480	220.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						0.9023 + J 1.17 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						2.84 + J 2.89 PU	
CBL-0036	CCSWBD	BHCCA	4	480	300.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						1.23 + J 1.60 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						3.88 + J 3.94 PU	

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE
CBL-0037	BHCCA	T- BLCCA PRI	2	480	10.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						0.0820 + J 0.1066 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						0.2585 + J 0.2624 PU	
CBL-0038	T-BLCCA SEC	BLCCA	4	208	10.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						0.2184 + J 0.2837 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						0.6882 + J 0.6986 PU	
CBL-0039	BLCCA	BLCCD	1	208	60.0	FEET	1/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1280 + J 0.0540 Ohms/1000 ft						17.75 + J 7.49 PU	
	Z0 Impedance: 0.4034 + J 0.1329 Ohms/1000 ft						55.94 + J 18.43 PU	
CBL-0040	BLCCA	UPS TEL-RM	1	208	270.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						18.35 + J 29.08 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						57.79 + J 71.58 PU	
CBL-0041	BUS-0047	PNL PDU	1	208	1.000	FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft				0.00023 + J 0.00023 PU	
	Z0 Impedance:0.00010 + J 0.00010 Ohms/1000 ft						0.00023 + J 0.00023 PU	
CBL-0042	PNL PDU	PNL LIEBERT	1	208	1.000	FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft				0.00023 + J 0.00023 PU	
	Z0 Impedance:0.00010 + J 0.00010 Ohms/1000 ft						0.00023 + J 0.00023 PU	
CBL-0043	BLCCA	BLCCC	1	208	290.0	FEET	1/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1280 + J 0.0540 Ohms/1000 ft						85.80 + J 36.20 PU	
	Z0 Impedance: 0.4034 + J 0.1329 Ohms/1000 ft						270.40 + J 89.08 PU	
CBL-0044	BHCCA	ECB CAT SCAN	1	480	20.0	FEET	4/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0640 + J 0.0497 Ohms/1000 ft						0.5556 + J 0.4314 PU	
	Z0 Impedance: 0.2017 + J 0.1224 Ohms/1000 ft						1.75 + J 1.06 PU	
CBL-0045	CCSWBD	BHCCB	4	480	225.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						0.9229 + J 1.20 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						2.91 + J 2.95 PU	

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE
CBL-0046	BHCCB	T-BLCCB PRI	1	480	10.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						0.1641 + J 0.2131 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						0.5169 + J 0.5247 PU	
CBL-0047	T-BLCCB SEC	BLCCB	4	208	10.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						0.2184 + J 0.2837 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						0.6882 + J 0.6986 PU	
CBL-0049	BLCCB	DIST PNL R	2	208	150.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						5.10 + J 8.08 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						16.05 + J 19.88 PU	
CBL-0050	BLCCB	BLCCE	1	208	140.0	FEET	1/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1280 + J 0.0540 Ohms/1000 ft						41.42 + J 17.47 PU	
	Z0 Impedance: 0.4034 + J 0.1329 Ohms/1000 ft						130.54 + J 43.01 PU	
CBL-0051	DIST PNL R	NUCLEAR MED	1	208	1.000	FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft				0.00023 + J 0.00023 PU	
	Z0 Impedance:0.00010 + J 0.00010 Ohms/1000 ft						0.00023 + J 0.00023 PU	
CBL-0052	DIST PNL R	RP5R	1	208	1.000	FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft				0.00023 + J 0.00023 PU	
	Z0 Impedance:0.00010 + J 0.00010 Ohms/1000 ft						0.00023 + J 0.00023 PU	
CBL-0053	DIST PNL R	3R	1	208	1.000	FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft				0.00023 + J 0.00023 PU	
	Z0 Impedance:0.00010 + J 0.00010 Ohms/1000 ft						0.00023 + J 0.00023 PU	
CBL-0054	DIST PNL R	RP4R	1	208	1.000	FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft				0.00023 + J 0.00023 PU	
	Z0 Impedance:0.00010 + J 0.00010 Ohms/1000 ft						0.00023 + J 0.00023 PU	
CBL-0055	DIST PNL R	350-A	1	208	1.000	FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft				0.00023 + J 0.00023 PU	
	Z0 Impedance:0.00010 + J 0.00010 Ohms/1000 ft						0.00023 + J 0.00023 PU	

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH	FEEDER SIZE	FEEDER TYPE
CBL-0056	DIST PNL R	PNL SQ D	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft	0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010			Ohms/1000 ft	0.00023 + J 0.00023	PU
CBL-0057	350-A	350-B	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft	0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010			Ohms/1000 ft	0.00023 + J 0.00023	PU
CBL-0058	RP4R	4RA	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft	0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010			Ohms/1000 ft	0.00023 + J 0.00023	PU
CBL-0059	EQSWBD	BHEQA	4	480	315.0 FEET	350	Copper
	Duct Material:	Magnetic					
	+/- Impedance:	0.0378 + J 0.0491			Ohms/1000 ft	1.29 + J 1.68	PU
	Z0 Impedance:	0.1191 + J 0.1209			Ohms/1000 ft	4.07 + J 4.13	PU
CBL-0060	BHEQA	T-BLEQA PRI	2	480	10.0 FEET	500	Copper
	Duct Material:	Magnetic					
	+/- Impedance:	0.0294 + J 0.0466			Ohms/1000 ft	0.0638 + J 0.1011	PU
	Z0 Impedance:	0.0926 + J 0.1147			Ohms/1000 ft	0.2010 + J 0.2489	PU
CBL-0061	T-BLEQA SEC	BLEQA	6	208	10.0 FEET	500	Copper
	Duct Material:	Magnetic					
	+/- Impedance:	0.0294 + J 0.0466			Ohms/1000 ft	0.1133 + J 0.1795	PU
	Z0 Impedance:	0.0926 + J 0.1147			Ohms/1000 ft	0.3567 + J 0.4419	PU
CBL-0062	BLEQA	MP5C-1	1	208	320.0 FEET	500	Copper
	Duct Material:	Magnetic					
	+/- Impedance:	0.0294 + J 0.0466			Ohms/1000 ft	21.75 + J 34.47	PU
	Z0 Impedance:	0.0926 + J 0.1147			Ohms/1000 ft	68.49 + J 84.84	PU
CBL-0063	MP5C-1	MP5C-2	1	208	6.0 FEET	500	Copper
	Duct Material:	Magnetic					
	+/- Impedance:	0.0294 + J 0.0466			Ohms/1000 ft	0.4077 + J 0.6463	PU
	Z0 Impedance:	0.0926 + J 0.1147			Ohms/1000 ft	1.28 + J 1.59	PU
CBL-0064	BLEQA	2CB	1	208	170.0 FEET	500	Copper
	Duct Material:	Magnetic					
	+/- Impedance:	0.0294 + J 0.0466			Ohms/1000 ft	11.55 + J 18.31	PU
	Z0 Impedance:	0.0926 + J 0.1147			Ohms/1000 ft	36.39 + J 45.07	PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	FEEDER TYPE	
CBL-0065	BLEQA	BLEQG	1	208	145.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft				21.45 + J	16.66	PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft				67.60 + J	41.02	PU
CBL-0066	BLEQA	BLEQE	1	208	140.0	FEET	500	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0294 + J	0.0466	Ohms/1000 ft				9.51 + J	15.08	PU
	Z0 Impedance: 0.0926 + J	0.1147	Ohms/1000 ft				29.96 + J	37.12	PU
CBL-0067	BLEQE	BLEQF	1	208	20.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft				2.96 + J	2.30	PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft				9.32 + J	5.66	PU
CBL-0068	BLEQA	BLEQH	1	208	80.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft				11.83 + J	9.19	PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft				37.30 + J	22.63	PU
CBL-0069	BLEQH	BLEQI	1	208	20.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft				2.96 + J	2.30	PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft				9.32 + J	5.66	PU
CBL-0070	BLEQA	ALADDIN SYS	1	208	340.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft				125.74 + J	44.79	PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft				396.24 + J	110.26	PU
CBL-0071	BLEQA	PNL ALADDIN	1	208	340.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft				50.30 + J	39.06	PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft				158.51 + J	96.19	PU
CBL-0072	BLEQA	PNL UTIL SHOP	1	208	150.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft				22.19 + J	17.23	PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft				69.93 + J	42.44	PU
CBL-0073	PNL UTIL SHOP	PNL UTIL SHOP	1	208	150.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft				22.19 + J	17.23	PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft				69.93 + J	42.44	PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE
CBL-0074	PNL UTIL SHOP	PNL UTIL SHOP	1	208	30.0	FEET	4/0	Copper
	Duct Material:	Magnetic						
	+/- Impedance:	0.0640 + J 0.0497	Ohms/1000 ft		4.44 + J	3.45	PU	
	Z0 Impedance:	0.2017 + J 0.1224	Ohms/1000 ft		13.99 + J	8.49	PU	
CBL-0075	BLEQA	LP3	1	208	1.000	FEET		Copper
	Duct Material:	Non-Magnetic	:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU		
CBL-0076	BLEQA	ADPM	1	208	1.000	FEET		Copper
	Duct Material:	Non-Magnetic	:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU		
CBL-0077	ADPM	SERVER	1	208	1.000	FEET		Copper
	Duct Material:	Non-Magnetic	:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU		
CBL-0079	BLEQA	LP2	1	208	1.000	FEET		Copper
	Duct Material:	Non-Magnetic	:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU		
CBL-0080	LP2	PNL TEL RM 1	1	208	1.000	FEET		Copper
	Duct Material:	Non-Magnetic	:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU		
CBL-0081	PNL TEL RM 1	PNL TEL RM 2	1	208	1.000	FEET		Copper
	Duct Material:	Non-Magnetic	:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU		
CBL-0082	LP2	LP5	1	208	1.000	FEET		Copper
	Duct Material:	Non-Magnetic	:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU		
CBL-0083	BLEQA	1LEQA	1	208	125.0	FEET	500	Copper
	Duct Material:	Magnetic						
	+/- Impedance:	0.0294 + J 0.0466	Ohms/1000 ft		8.49 + J	13.46	PU	
	Z0 Impedance:	0.0926 + J 0.1147	Ohms/1000 ft		26.75 + J	33.14	PU	

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0084	1LEQA	2LEQA	1	208	20.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			1.36 + J	2.15	PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			4.28 + J	5.30	PU
CBL-0085	BLEQA	3LEQA	1	208	145.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			9.85 + J	15.62	PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			31.04 + J	38.44	PU
CBL-0086	3LEQA	4LEQA	1	208	20.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			1.36 + J	2.15	PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			4.28 + J	5.30	PU
CBL-0087	4LEQA	4LEQC	1	208	150.0	FEET	4/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			22.19 + J	17.23	PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			69.93 + J	42.44	PU
CBL-0088	BLEQA	5LEQA	1	208	170.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			11.55 + J	18.31	PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			36.39 + J	45.07	PU
CBL-0089	5LEQA	6LEQA	1	208	20.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			1.36 + J	2.15	PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			4.28 + J	5.30	PU
CBL-0090	BHEQA	PHEQA	2	480	190.0	FEET	350	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0378 + J 0.0491		Ohms/1000 ft			1.56 + J	2.02	PU
	Z0 Impedance:	0.1191 + J 0.1209		Ohms/1000 ft			4.91 + J	4.99	PU
CBL-0091	PHEQA	T-PLEQA PRI	1	480	10.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0349		Ohms/1000 ft			0.1276 + J	0.1515	PU
	Z0 Impedance:	0.0926 + J 0.0859		Ohms/1000 ft			0.4019 + J	0.3728	PU
CBL-0092	T-PLEQA SEC	PLEQA	2	208	10.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			0.3398 + J	0.5386	PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			1.07 + J	1.33	PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0093	PLEQA	PNL B	1	208	50.0	FEET	1/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1280 + J 0.0540		Ohms/1000 ft			14.79 + J	6.24	PU
	Z0 Impedance:	0.4034 + J 0.1329		Ohms/1000 ft			46.62 + J	15.36	PU
CBL-0094	EQSWBD	BHEQB	4	480	240.0	FEET	350	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0378 + J 0.0491		Ohms/1000 ft			0.9844 + J	1.28	PU
	Z0 Impedance:	0.1191 + J 0.1209		Ohms/1000 ft			3.10 + J	3.15	PU
CBL-0095	BHEQB	T-BLEQB PRI	1	480	10.0	FEET	3/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0805 + J 0.0519		Ohms/1000 ft			0.3494 + J	0.2253	PU
	Z0 Impedance:	0.2537 + J 0.1278		Ohms/1000 ft			1.10 + J	0.5547	PU
CBL-0096	T-BLEQB SEC	BLEQB	1	208	10.0	FEET	350	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0378 + J 0.0491		Ohms/1000 ft			0.8737 + J	1.13	PU
	Z0 Impedance:	0.1191 + J 0.1209		Ohms/1000 ft			2.75 + J	2.79	PU
CBL-0097	2HEQB	T-2LEQB PRI	1	480	10.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			0.6944 + J	0.2474	PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			2.19 + J	0.6089	PU
CBL-0098	T-2 LEQB SEC	2LEQB	1	208	10.0	FEET	2/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1020 + J 0.0533		Ohms/1000 ft			2.36 + J	1.23	PU
	Z0 Impedance:	0.3214 + J 0.1312		Ohms/1000 ft			7.43 + J	3.03	PU
CBL-0099	BHEQB	2HEQB	1	480	50.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			0.6380 + J	1.01	PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			2.01 + J	2.49	PU
CBL-0100	2LEQB	1LEQB	1	208	20.0	FEET	1/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1280 + J 0.0540		Ohms/1000 ft			5.92 + J	2.50	PU
	Z0 Impedance:	0.4034 + J 0.1329		Ohms/1000 ft			18.65 + J	6.14	PU
CBL-0101	4HEQB	T-4LEQB PRI	1	480	10.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			0.6944 + J	0.2474	PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			2.19 + J	0.6089	PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0102	T-4LEQB SEC	4LEQB	1	208	10.0	FEET	2/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1020 + J 0.0533	Ohms/1000 ft				2.36 + J	1.23	PU
	Z0 Impedance:	0.3214 + J 0.1312	Ohms/1000 ft				7.43 + J	3.03	PU
CBL-0103	BHEQB	4HEQB	1	480	80.0	FEET	500	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0294 + J 0.0466	Ohms/1000 ft				1.02 + J	1.62	PU
	Z0 Impedance:	0.0926 + J 0.1147	Ohms/1000 ft				3.22 + J	3.98	PU
CBL-0104	4LEQB	3LEQB	1	208	20.0	FEET	1/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1280 + J 0.0540	Ohms/1000 ft				5.92 + J	2.50	PU
	Z0 Impedance:	0.4034 + J 0.1329	Ohms/1000 ft				18.65 + J	6.14	PU
CBL-0105	3LEQB	EQUIP RM 372	1	208	160.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1600 + J 0.0570	Ohms/1000 ft				59.17 + J	21.08	PU
	Z0 Impedance:	0.5042 + J 0.1403	Ohms/1000 ft				186.46 + J	51.89	PU
CBL-0106	6HEQB	T-6LEQB PRI	1	480	10.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1600 + J 0.0570	Ohms/1000 ft				0.6944 + J	0.2474	PU
	Z0 Impedance:	0.5042 + J 0.1403	Ohms/1000 ft				2.19 + J	0.6089	PU
CBL-0107	T-6LEQB SEC	6LEQB	1	208	10.0	FEET	2/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1020 + J 0.0533	Ohms/1000 ft				2.36 + J	1.23	PU
	Z0 Impedance:	0.3214 + J 0.1312	Ohms/1000 ft				7.43 + J	3.03	PU
CBL-0108	BHEQB	6HEQB	1	480	120.0	FEET	500	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0294 + J 0.0466	Ohms/1000 ft				1.53 + J	2.43	PU
	Z0 Impedance:	0.0926 + J 0.1147	Ohms/1000 ft				4.82 + J	5.97	PU
CBL-0109	6LEQB	5LEQB	1	208	15.0	FEET	1/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1280 + J 0.0540	Ohms/1000 ft				4.44 + J	1.87	PU
	Z0 Impedance:	0.4034 + J 0.1329	Ohms/1000 ft				13.99 + J	4.61	PU
CBL-0110	BLEQB	BLEQJ	1	208	150.0	FEET	1/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1280 + J 0.0540	Ohms/1000 ft				44.38 + J	18.72	PU
	Z0 Impedance:	0.4034 + J 0.1329	Ohms/1000 ft				139.86 + J	46.08	PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0111	BLEQB	PNL BIO MED	1	208	280.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			103.55 + J 36.89		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			326.31 + J 90.80		PU
CBL-0112	BHLSA	T-BLLSA PRI	1	480	10.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			0.1276 + J 0.2023		PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			0.4019 + J 0.4978		PU
CBL-0113	T-BLLSA SEC	BLLSA	2	208	10.0	FEET	350	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0378 + J 0.0491		Ohms/1000 ft			0.4369 + J 0.5674		PU
	Z0 Impedance:	0.1191 + J 0.1209		Ohms/1000 ft			1.38 + J 1.40		PU
CBL-0114	BLLSA	BLLSF	1	208	180.0	FEET	4/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			26.63 + J 20.68		PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			83.92 + J 50.92		PU
CBL-0115	BLLSA	BLLSD	1	208	55.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			20.34 + J 7.25		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			64.10 + J 17.84		PU
CBL-0116	LSSWBD	BHLSA	1	480	315.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			4.02 + J 6.37		PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			12.66 + J 15.68		PU
CBL-0117	BLLSF	BLLSE	1	208	10.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			3.70 + J 1.32		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			11.65 + J 3.24		PU
CBL-0118	BLLSA	BLEQC	1	208	290.0	FEET	4/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			42.90 + J 33.31		PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			135.20 + J 82.05		PU
CBL-0119	BLEQC	BLEQD	1	208	20.0	FEET	4/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			2.96 + J 2.30		PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			9.32 + J 5.66		PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0120	BLLSA	BLLSC	1	208	300.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft		110.95 + J		39.52		PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft		349.62 + J		97.29		PU
CBL-0121	BLLSA	1LLSA	1	208	145.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft		21.45 + J		16.66		PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft		67.60 + J		41.02		PU
CBL-0122	1LLSA	1WCLS	1	208	250.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft		92.46 + J		32.94		PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft		291.35 + J		81.07		PU
CBL-0123	1LLSA	2LLSA	1	208	20.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft		2.96 + J		2.30		PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft		9.32 + J		5.66		PU
CBL-0124	2LLSA	2LLSC	1	208	200.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft		73.96 + J		26.35		PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft		233.08 + J		64.86		PU
CBL-0125	1LLSA	1LLSC	1	208	160.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft		59.17 + J		21.08		PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft		186.46 + J		51.89		PU
CBL-0126	BLLSA	3LLSA	1	208	165.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft		24.41 + J		18.95		PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft		76.92 + J		46.68		PU
CBL-0127	3LLSA	3LLSC	1	208	210.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft		77.66 + J		27.67		PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft		244.73 + J		68.10		PU
CBL-0128	3LLSA	4LLSA	1	208	20.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft		2.96 + J		2.30		PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft		9.32 + J		5.66		PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0129	4LLSA	4LLSC	1	208	150.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			55.47 + J 19.76		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			174.81 + J 48.64		PU
CBL-0130	BLLSA	5LLSA	1	208	185.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			27.37 + J 21.25		PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			86.25 + J 52.34		PU
CBL-0131	5LLSA	LP5C	1	208	90.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			33.28 + J 11.86		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			104.89 + J 29.19		PU
CBL-0132	5LLSA	6LLSA	1	208	20.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			2.96 + J 2.30		PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			9.32 + J 5.66		PU
CBL-0133	6LLSA	LP6C	1	208	70.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			25.89 + J 9.22		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			81.58 + J 22.70		PU
CBL-0134	1HLSB	T-1LLSB PRI	1	480	10.0	FEET	3/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0805 + J 0.0519		Ohms/1000 ft			0.3494 + J 0.2253		PU
	Z0 Impedance:	0.2537 + J 0.1278		Ohms/1000 ft			1.10 + J 0.5547		PU
CBL-0135	T-1LLSB SEC	1LLSB	1	208	10.0	FEET	350	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0378 + J 0.0491		Ohms/1000 ft			0.8737 + J 1.13		PU
	Z0 Impedance:	0.1191 + J 0.1209		Ohms/1000 ft			2.75 + J 2.79		PU
CBL-0136	LSSWBD	BHLSB	1	480	250.0	FEET	500	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			3.19 + J 5.06		PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			10.05 + J 12.45		PU
CBL-0137	BHLSB	1HLSB	1	480	20.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			0.5556 + J 0.4314		PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			1.75 + J 1.06		PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0138	1LLSB	BLLSB	1	208	20.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft				7.40 + J	2.63	PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft				23.31 + J	6.49	PU
CBL-0139	BLLSB	BLLSG	1	208	140.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft				51.78 + J	18.44	PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft				163.16 + J	45.40	PU
CBL-0140	1LLSB	1LLSD	1	208	180.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft				66.57 + J	23.71	PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft				209.77 + J	58.37	PU
CBL-0141	1LLSB	2LLSB	1	208	20.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft				7.40 + J	2.63	PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft				23.31 + J	6.49	PU
CBL-0142	2LLSB	2LLSD	1	208	150.0	FEET	1/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1280 + J	0.0540	Ohms/1000 ft				44.38 + J	18.72	PU
	Z0 Impedance: 0.4034 + J	0.1329	Ohms/1000 ft				139.86 + J	46.08	PU
CBL-0145	3HLSB	T-3LLSB PRI	1	480	10.0	FEET	4	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.3210 + J	0.0632	Ohms/1000 ft				1.39 + J	0.2743	PU
	Z0 Impedance: 1.01 + J	0.1556	Ohms/1000 ft				4.39 + J	0.6753	PU
CBL-0146	T-3LLSB SEC	3LLSB	1	208	10.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft				3.70 + J	1.32	PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft				11.65 + J	3.24	PU
CBL-0147	BHLSB	3HLSB	1	480	60.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft				4.17 + J	1.48	PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft				13.13 + J	3.65	PU
CBL-0148	3LLSB	3LLSD	1	208	150.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1600 + J	0.0570	Ohms/1000 ft				55.47 + J	19.76	PU
	Z0 Impedance: 0.5042 + J	0.1403	Ohms/1000 ft				174.81 + J	48.64	PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0149	3LLSB	4LLSB	1	208	20.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			7.40 + J 2.63		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			23.31 + J 6.49		PU
CBL-0150	4LLSB	4LLSD	1	208	180.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			66.57 + J 23.71		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			209.77 + J 58.37		PU
CBL-0151	5HLSB	T-5LLSB PRI	1	480	10.0	FEET	4	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.3210 + J 0.0632		Ohms/1000 ft			1.39 + J 0.2743		PU
	Z0 Impedance:	1.01 + J 0.1556		Ohms/1000 ft			4.39 + J 0.6753		PU
CBL-0152	T-5LLSB SEC	5LLSB	1	208	10.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			3.70 + J 1.32		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			11.65 + J 3.24		PU
CBL-0153	BHLSB	5HLSB	1	480	100.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			6.94 + J 2.47		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			21.88 + J 6.09		PU
CBL-0154	5LLSB	6LLSB	1	208	20.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			7.40 + J 2.63		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			23.31 + J 6.49		PU
CBL-0155	BHNA	T-BLNA PRI	2	480	10.0	FEET	500	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			0.0638 + J 0.1011		PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			0.2010 + J 0.2489		PU
CBL-0156	T-BLNA SEC	BLNA	6	208	10.0	FEET	500	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			0.1133 + J 0.1795		PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			0.3567 + J 0.4419		PU
CBL-0158	BLNA	BLND	1	208	60.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			8.88 + J 6.89		PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			27.97 + J 16.97		PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	FEEDER TYPE	
CBL-0159	BLNA	BLNE	1	208	190.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			28.11 + J	21.83	PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			88.58 + J	53.75	PU
CBL-0160	BLNA	BLNC	1	208	305.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			45.12 + J	35.04	PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			142.19 + J	86.29	PU
CBL-0161	BLNA	BUS-0180	1	208	155.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0640 + J 0.0381		Ohms/1000 ft			22.93 + J	13.65	PU
	Z0 Impedance:	0.2017 + J 0.0938		Ohms/1000 ft			72.26 + J	33.61	PU
CBL-0162	BLNA	1LNA	2	208	150.0	FEET	350	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0378 + J 0.0491		Ohms/1000 ft			6.55 + J	8.51	PU
	Z0 Impedance:	0.1191 + J 0.1209		Ohms/1000 ft			20.65 + J	20.96	PU
CBL-0163	1LNA	1CB	1	208	220.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			32.54 + J	25.27	PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			102.57 + J	62.24	PU
CBL-0164	1CB	1CD	1	208	20.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			2.96 + J	2.30	PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			9.32 + J	5.66	PU
CBL-0165	1LNA	1WC	1	208	250.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			36.98 + J	28.72	PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			116.55 + J	70.73	PU
CBL-0166	1LNA	2LNA	2	208	20.0	FEET	350	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.0378 + J 0.0491		Ohms/1000 ft			0.8737 + J	1.13	PU
	Z0 Impedance:	0.1191 + J 0.1209		Ohms/1000 ft			2.75 + J	2.79	PU
CBL-0167	1LNA	1CC	1	208	250.0	FEET	1	Copper	
	Duct Material: Magnetic								
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			92.46 + J	32.94	PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			291.35 + J	81.07	PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0168	1LNA	1CA	1	208	300.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570	Ohms/1000 ft				110.95 + J 39.52		PU
	Z0 Impedance:	0.5042 + J 0.1403	Ohms/1000 ft				349.62 + J 97.29		PU
CBL-0169	BLNA	3LNA	1	208	170.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466	Ohms/1000 ft				11.55 + J 18.31		PU
	Z0 Impedance:	0.0926 + J 0.1147	Ohms/1000 ft				36.39 + J 45.07		PU
CBL-0170	3LNA	3LNC	1	208	120.0	FEET	4/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0640 + J 0.0497	Ohms/1000 ft				17.75 + J 13.79		PU
	Z0 Impedance:	0.2017 + J 0.1224	Ohms/1000 ft				55.94 + J 33.95		PU
CBL-0171	3LNA	4LNA	1	208	20.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466	Ohms/1000 ft				1.36 + J 2.15		PU
	Z0 Impedance:	0.0926 + J 0.1147	Ohms/1000 ft				4.28 + J 5.30		PU
CBL-0172	4LNA	4LNC	1	208	150.0	FEET	1/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1280 + J 0.0540	Ohms/1000 ft				44.38 + J 18.72		PU
	Z0 Impedance:	0.4034 + J 0.1329	Ohms/1000 ft				139.86 + J 46.08		PU
CBL-0173	BLNA	5LNA	1	208	195.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466	Ohms/1000 ft				13.25 + J 21.00		PU
	Z0 Impedance:	0.0926 + J 0.1147	Ohms/1000 ft				41.74 + J 51.70		PU
CBL-0174	5LNA	6LNA	1	208	20.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466	Ohms/1000 ft				1.36 + J 2.15		PU
	Z0 Impedance:	0.0926 + J 0.1147	Ohms/1000 ft				4.28 + J 5.30		PU
CBL-0175	BLNA	PLNA	1	208	220.0	FEET	4/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0640 + J 0.0497	Ohms/1000 ft				32.54 + J 25.27		PU
	Z0 Impedance:	0.2017 + J 0.1224	Ohms/1000 ft				102.57 + J 62.24		PU
CBL-0176	1 HNB	T-1LNB PRI	1	480	10.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466	Ohms/1000 ft				0.1276 + J 0.2023		PU
	Z0 Impedance:	0.0926 + J 0.1147	Ohms/1000 ft				0.4019 + J 0.4978		PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0177	T-1LNB SEC	1LNB	2	208	10.0	FEET	350	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0378 + J 0.0491		Ohms/1000 ft			0.4369 + J	0.5674	PU
	Z0 Impedance:	0.1191 + J 0.1209		Ohms/1000 ft			1.38 + J	1.40	PU
CBL-0178	BHNB	1 HNB	1	480	20.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			0.2552 + J	0.4045	PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			0.8038 + J	0.9957	PU
CBL-0179	1LNB	1LNC	1	208	180.0	FEET	1/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1280 + J 0.0540		Ohms/1000 ft			53.25 + J	22.47	PU
	Z0 Impedance:	0.4034 + J 0.1329		Ohms/1000 ft			167.83 + J	55.29	PU
CBL-0180	1LNB	BLNF	1	208	160.0	FEET	1/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1280 + J 0.0540		Ohms/1000 ft			47.34 + J	19.97	PU
	Z0 Impedance:	0.4034 + J 0.1329		Ohms/1000 ft			149.19 + J	49.15	PU
CBL-0181	2HNB	T-2LNB PRI	1	480	10.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			0.6944 + J	0.2474	PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			2.19 + J	0.6089	PU
CBL-0182	T-2LNB SEC	2LNB	1	208	10.0	FEET	2/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1020 + J 0.0533		Ohms/1000 ft			2.36 + J	1.23	PU
	Z0 Impedance:	0.3214 + J 0.1312		Ohms/1000 ft			7.43 + J	3.03	PU
CBL-0183	BHNB	2HNB	1	480	40.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			0.5104 + J	0.8090	PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			1.61 + J	1.99	PU
CBL-0184	2LNB	PNL RM 2171	1	208	10.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			3.70 + J	1.32	PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			11.65 + J	3.24	PU
CBL-0185	3HNB	T-3LNB PRI	1	480	10.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			0.6944 + J	0.2474	PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			2.19 + J	0.6089	PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE
CBL-0186	T-3LNB SEC	3LNB	1	208	10.0	FEET	2/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1020 + J 0.0533 Ohms/1000 ft						2.36 + J 1.23 PU	
	Z0 Impedance: 0.3214 + J 0.1312 Ohms/1000 ft						7.43 + J 3.03 PU	
CBL-0187	BHNB	3HNB	1	480	60.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						0.7656 + J 1.21 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						2.41 + J 2.99 PU	
CBL-0188	4HNB	T-4LNB PRI	1	480	10.0	FEET	1	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1600 + J 0.0570 Ohms/1000 ft						0.6944 + J 0.2474 PU	
	Z0 Impedance: 0.5042 + J 0.1403 Ohms/1000 ft						2.19 + J 0.6089 PU	
CBL-0189	T-4LNB SEC	4LNB	1	208	10.0	FEET	2/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1020 + J 0.0533 Ohms/1000 ft						2.36 + J 1.23 PU	
	Z0 Impedance: 0.3214 + J 0.1312 Ohms/1000 ft						7.43 + J 3.03 PU	
CBL-0190	BHNB	4HNB	1	480	80.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						1.02 + J 1.62 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						3.22 + J 3.98 PU	
CBL-0191	5HNB	T-5LNB PRI	1	480	10.0	FEET	1	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1600 + J 0.0570 Ohms/1000 ft						0.6944 + J 0.2474 PU	
	Z0 Impedance: 0.5042 + J 0.1403 Ohms/1000 ft						2.19 + J 0.6089 PU	
CBL-0192	T-5LNB SEC	5LNB	1	208	10.0	FEET	2/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1020 + J 0.0533 Ohms/1000 ft						2.36 + J 1.23 PU	
	Z0 Impedance: 0.3214 + J 0.1312 Ohms/1000 ft						7.43 + J 3.03 PU	
CBL-0193	BHNB	5HNB	1	480	100.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						1.28 + J 2.02 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						4.02 + J 4.98 PU	
CBL-0194	6HNB	T-6LNB PRI	1	480	10.0	FEET	1	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1600 + J 0.0570 Ohms/1000 ft						0.6944 + J 0.2474 PU	
	Z0 Impedance: 0.5042 + J 0.1403 Ohms/1000 ft						2.19 + J 0.6089 PU	

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE
CBL-0195	T-6LNB SEC	6LNB	1	208	10.0	FEET	2/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1020 + J 0.0533 Ohms/1000 ft						2.36 + J 1.23 PU	
	Z0 Impedance: 0.3214 + J 0.1312 Ohms/1000 ft						7.43 + J 3.03 PU	
CBL-0196	BHNB	6HNB	1	480	120.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						1.53 + J 2.43 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						4.82 + J 5.97 PU	
CBL-0197	BLCCA	1LCCA	2	208	135.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						5.90 + J 7.66 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						18.58 + J 18.86 PU	
CBL-0198	1LCCA	1LCCC	1	208	220.0	FEET	1/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1280 + J 0.0540 Ohms/1000 ft						65.09 + J 27.46 PU	
	Z0 Impedance: 0.4034 + J 0.1329 Ohms/1000 ft						205.13 + J 67.58 PU	
CBL-0199	1LCCA	PNL CHAPEL	1	208	1.000	FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft				0.00023 + J 0.00023 PU	
	Z0 Impedance:0.00010 + J 0.00010 Ohms/1000 ft						0.00023 + J 0.00023 PU	
CBL-0200	1LCCA	1C	1	208	90.0	FEET	1	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1600 + J 0.0570 Ohms/1000 ft						33.28 + J 11.86 PU	
	Z0 Impedance: 0.5042 + J 0.1403 Ohms/1000 ft						104.89 + J 29.19 PU	
CBL-0201	1LCCA	2LCCA	2	208	20.0	FEET	350	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						0.8737 + J 1.13 PU	
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						2.75 + J 2.79 PU	
CBL-0202	2LCCA	2LCCC	1	208	200.0	FEET	4/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0640 + J 0.0497 Ohms/1000 ft						29.59 + J 22.98 PU	
	Z0 Impedance: 0.2017 + J 0.1224 Ohms/1000 ft						93.24 + J 56.58 PU	
CBL-0203	2LCCC	2LCCD	1	208	10.0	FEET	1/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1280 + J 0.0540 Ohms/1000 ft						2.96 + J 1.25 PU	
	Z0 Impedance: 0.4034 + J 0.1329 Ohms/1000 ft						9.32 + J 3.07 PU	

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE
CBL-0204	2LCCA	DENTAL CLINIC	1	208	220.0	FEET	1	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1600 + J 0.0570 Ohms/1000 ft						81.36 + J 28.98 PU	
	Z0 Impedance: 0.5042 + J 0.1403 Ohms/1000 ft						256.39 + J 71.34 PU	
CBL-0205	BHNA	2HNA	1	480	150.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						1.91 + J 3.03 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						6.03 + J 7.47 PU	
CBL-0206	BHNA	4HNA	1	480	400.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						5.10 + J 8.09 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						16.08 + J 19.91 PU	
CBL-0207	BHNA	6HNA	1	480	190.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						2.42 + J 3.84 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						7.64 + J 9.46 PU	
CBL-0208	BHEQA	2HEQA	1	480	130.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						1.66 + J 2.63 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						5.22 + J 6.47 PU	
CBL-0209	BHEQA	4HEQA	1	480	150.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						1.91 + J 3.03 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						6.03 + J 7.47 PU	
CBL-0210	BHEQA	6HEQA	1	480	175.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						2.23 + J 3.54 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						7.03 + J 8.71 PU	
CBL-0211	BLCCA	3A1	1	208	350.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						23.78 + J 37.70 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						74.91 + J 92.79 PU	
CBL-0212	3A1	3A2	1	208	1.000	FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft				0.00023 + J 0.00023 PU	
	Z0 Impedance:0.00010 + J 0.00010 Ohms/1000 ft						0.00023 + J 0.00023 PU	

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0213	3A2	3L	1	208	1.000	FEET		Copper	
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:	0.00010 + J 0.00010			Ohms/1000 ft		0.00023 + J 0.00023		PU
CBL-0214	BLCCA	3LCCA	1	208	150.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466			Ohms/1000 ft		10.19 + J 16.16		PU
	Z0 Impedance:	0.0926 + J 0.1147			Ohms/1000 ft		32.11 + J 39.77		PU
CBL-0215	3LCCA	3LCCC	1	208	120.0	FEET	4/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0640 + J 0.0497			Ohms/1000 ft		17.75 + J 13.79		PU
	Z0 Impedance:	0.2017 + J 0.1224			Ohms/1000 ft		55.94 + J 33.95		PU
CBL-0216	3LCCA	3A EM	1	208	190.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570			Ohms/1000 ft		70.27 + J 25.03		PU
	Z0 Impedance:	0.5042 + J 0.1403			Ohms/1000 ft		221.43 + J 61.61		PU
CBL-0217	3LCCA	4LCCA	1	208	20.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466			Ohms/1000 ft		1.36 + J 2.15		PU
	Z0 Impedance:	0.0926 + J 0.1147			Ohms/1000 ft		4.28 + J 5.30		PU
CBL-0218	4LCCA	4C	1	208	120.0	FEET	4/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0640 + J 0.0497			Ohms/1000 ft		17.75 + J 13.79		PU
	Z0 Impedance:	0.2017 + J 0.1224			Ohms/1000 ft		55.94 + J 33.95		PU
CBL-0219	4C	4AD	1	208	1.000	FEET		Copper	
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:	0.00010 + J 0.00010			Ohms/1000 ft		0.00023 + J 0.00023		PU
CBL-0220	BLCCA	4DP	1	208	390.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466			Ohms/1000 ft		26.50 + J 42.01		PU
	Z0 Impedance:	0.0926 + J 0.1147			Ohms/1000 ft		83.47 + J 103.40		PU
CBL-0221	4DP	4EML	1	208	20.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570			Ohms/1000 ft		7.40 + J 2.63		PU
	Z0 Impedance:	0.5042 + J 0.1403			Ohms/1000 ft		23.31 + J 6.49		PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	FEEDER TYPE
CBL-0222	4DP	4L	1	208	10.0	FEET	1/0	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1280 + J 0.0540 Ohms/1000 ft						2.96 + J 1.25 PU	
	Z0 Impedance: 0.4034 + J 0.1329 Ohms/1000 ft						9.32 + J 3.07 PU	
CBL-0223	4DP	4LA	1	208	10.0	FEET	1	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1600 + J 0.0570 Ohms/1000 ft						3.70 + J 1.32 PU	
	Z0 Impedance: 0.5042 + J 0.1403 Ohms/1000 ft						11.65 + J 3.24 PU	
CBL-0226	BLCCA	5LCCA	1	208	175.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						11.89 + J 18.85 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						37.46 + J 46.40 PU	
CBL-0227	5LCCA	6LCCA	1	208	20.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						1.36 + J 2.15 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						4.28 + J 5.30 PU	
CBL-0228	6LCCA	RP6L	1	208	200.0	FEET	1	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1600 + J 0.0570 Ohms/1000 ft						73.96 + J 26.35 PU	
	Z0 Impedance: 0.5042 + J 0.1403 Ohms/1000 ft						233.08 + J 64.86 PU	
CBL-0229	5LCCA	RP5L	1	208	180.0	FEET	1	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.1600 + J 0.0570 Ohms/1000 ft						66.57 + J 23.71 PU	
	Z0 Impedance: 0.5042 + J 0.1403 Ohms/1000 ft						209.77 + J 58.37 PU	
CBL-0230	BLLSA	EM 100	1	208	1.000	FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft				0.00023 + J 0.00023 PU	
	Z0 Impedance:0.00010 + J 0.00010 Ohms/1000 ft						0.00023 + J 0.00023 PU	
CBL-0231	BHCCB	1HCCB	1	480	20.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						0.2552 + J 0.4045 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						0.8038 + J 0.9957 PU	
CBL-0232	1HCCB	T-1 LCCB PRI	1	480	10.0	FEET	500	Copper
	Duct Material: Magnetic							
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						0.1276 + J 0.2023 PU	
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						0.4019 + J 0.4978 PU	

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0233	T-1 LCCB SEC	1LCCB	1	208	10.0	FEET	350	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0378 + J 0.0491		Ohms/1000 ft			0.8737 + J 1.13		PU
	Z0 Impedance:	0.1191 + J 0.1209		Ohms/1000 ft			2.75 + J 2.79		PU
CBL-0234	1LCCB	PNL R	1	208	200.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			73.96 + J 26.35		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			233.08 + J 64.86		PU
CBL-0235	1LCCB	PNL L	1	208	200.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			73.96 + J 26.35		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			233.08 + J 64.86		PU
CBL-0236	1LCCB	1LCCD	1	208	180.0	FEET	4/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			26.63 + J 20.68		PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			83.92 + J 50.92		PU
CBL-0237	1LCCD	1LCCE	1	208	10.0	FEET	4/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0640 + J 0.0497		Ohms/1000 ft			1.48 + J 1.15		PU
	Z0 Impedance:	0.2017 + J 0.1224		Ohms/1000 ft			4.66 + J 2.83		PU
CBL-0238	1LCCB	2LCCB	1	208	20.0	FEET	500	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.0294 + J 0.0466		Ohms/1000 ft			1.36 + J 2.15		PU
	Z0 Impedance:	0.0926 + J 0.1147		Ohms/1000 ft			4.28 + J 5.30		PU
CBL-0239	2LCCB	PNL A	1	208	210.0	FEET	1	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1600 + J 0.0570		Ohms/1000 ft			77.66 + J 27.67		PU
	Z0 Impedance:	0.5042 + J 0.1403		Ohms/1000 ft			244.73 + J 68.10		PU
CBL-0240	2LCCB	2LCCE	1	208	150.0	FEET	1/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1280 + J 0.0540		Ohms/1000 ft			44.38 + J 18.72		PU
	Z0 Impedance:	0.4034 + J 0.1329		Ohms/1000 ft			139.86 + J 46.08		PU
CBL-0241	2LCCB	2LCCF	1	208	150.0	FEET	1/0	Copper	
	Duct Material:	Magnetic							
	+/- Impedance:	0.1280 + J 0.0540		Ohms/1000 ft			44.38 + J 18.72		PU
	Z0 Impedance:	0.4034 + J 0.1329		Ohms/1000 ft			139.86 + J 46.08		PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	FEEDER TYPE	
CBL-0242	BHCCB	3HCCB	1	480	60.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft				1.67 + J	1.29	PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft				5.25 + J	3.19	PU
CBL-0243	3HCCB	T-3LCCB PRI	1	480	10.0	FEET	3/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0805 + J	0.0519	Ohms/1000 ft				0.3494 + J	0.2253	PU
	Z0 Impedance: 0.2537 + J	0.1278	Ohms/1000 ft				1.10 + J	0.5547	PU
CBL-0244	T-3LCCB SEC	3LCCB	1	208	10.0	FEET	350	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0378 + J	0.0491	Ohms/1000 ft				0.8737 + J	1.13	PU
	Z0 Impedance: 0.1191 + J	0.1209	Ohms/1000 ft				2.75 + J	2.79	PU
CBL-0245	3LCCB	EMER RM 360	1	208	150.0	FEET	1/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1280 + J	0.0540	Ohms/1000 ft				44.38 + J	18.72	PU
	Z0 Impedance: 0.4034 + J	0.1329	Ohms/1000 ft				139.86 + J	46.08	PU
CBL-0246	3LCCB	4LCCB	1	208	20.0	FEET	1/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.1280 + J	0.0540	Ohms/1000 ft				5.92 + J	2.50	PU
	Z0 Impedance: 0.4034 + J	0.1329	Ohms/1000 ft				18.65 + J	6.14	PU
CBL-0247	BHCCB	5HCCB	1	480	100.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft				2.78 + J	2.16	PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft				8.75 + J	5.31	PU
CBL-0248	5HCCB	T-5LCCB PRI	1	480	10.0	FEET	3/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0805 + J	0.0397	Ohms/1000 ft				0.3494 + J	0.1723	PU
	Z0 Impedance: 0.2537 + J	0.0978	Ohms/1000 ft				1.10 + J	0.4245	PU
CBL-0249	T-5LCCB SEC	5LCCB	1	208	10.0	FEET	350	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0378 + J	0.0491	Ohms/1000 ft				0.8737 + J	1.13	PU
	Z0 Impedance: 0.1191 + J	0.1209	Ohms/1000 ft				2.75 + J	2.79	PU
CBL-0250	5LCCB	6LCCB	1	208	20.0	FEET	4/0	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0640 + J	0.0497	Ohms/1000 ft				2.96 + J	2.30	PU
	Z0 Impedance: 0.2017 + J	0.1224	Ohms/1000 ft				9.32 + J	5.66	PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH	FEEDER SIZE	FEEDER TYPE
CBL-0251	6LCCB	RP6R	1	208	130.0 FEET	1/0	Copper
	Duct Material: Magnetic						
	+/- Impedance: 0.1280 + J 0.0540 Ohms/1000 ft					38.46 + J 16.23 PU	
	Z0 Impedance: 0.4034 + J 0.1329 Ohms/1000 ft					121.21 + J 39.93 PU	
CBL-0252	SWBD X EMERG D	BUS-0280	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft			0.00023 + J 0.00023 PU	
	Z0 Impedance: 0.00010 + J 0.00010 Ohms/1000 ft					0.00023 + J 0.00023 PU	
CBL-0253	ATS ELTS	BUS ELEVATOR	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft			0.00023 + J 0.00023 PU	
	Z0 Impedance: 0.00010 + J 0.00010 Ohms/1000 ft					0.00023 + J 0.00023 PU	
CBL-0254	SWBD X EMERG D	BUS-0283	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft			0.00023 + J 0.00023 PU	
	Z0 Impedance: 0.00010 + J 0.00010 Ohms/1000 ft					0.00023 + J 0.00023 PU	
CBL-0255	ATS CTS	CDP	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft			0.00023 + J 0.00023 PU	
	Z0 Impedance: 0.00010 + J 0.00010 Ohms/1000 ft					0.00023 + J 0.00023 PU	
CBL-0256	SWBD X EMERG D	BUS-0286	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft			0.00023 + J 0.00023 PU	
	Z0 Impedance: 0.00010 + J 0.00010 Ohms/1000 ft					0.00023 + J 0.00023 PU	
CBL-0257	ATS C3WTS	C3W	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft			0.00023 + J 0.00023 PU	
	Z0 Impedance: 0.00010 + J 0.00010 Ohms/1000 ft					0.00023 + J 0.00023 PU	
CBL-0258	SWBD X EMERG D	BUS-0289	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft			0.00023 + J 0.00023 PU	
	Z0 Impedance: 0.00010 + J 0.00010 Ohms/1000 ft					0.00023 + J 0.00023 PU	
CBL-0259	ETS 2	EDP-2	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010 Ohms/1000 ft			0.00023 + J 0.00023 PU	
	Z0 Impedance: 0.00010 + J 0.00010 Ohms/1000 ft					0.00023 + J 0.00023 PU	

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH	SIZE	FEEDER TYPE
CBL-0260	SWBD X EMERG D	BUS-0292	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance: 0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0261	ETS 1	EDP-1	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance: 0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0262	SWBD X EMERG D	BUS-0295	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance: 0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0263	ATS LSTS	LSDP	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance: 0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0264	SWBD X EMERG D	T X-RAY PRI	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance: 0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0265	ATS XTS	X-RAY	1	480	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00004 + J 0.00004	PU
	Z0 Impedance: 0.00010 + J 0.00010		Ohms/1000 ft		0.00004 + J 0.00004	PU	
CBL-0266	T X-RAY SEC	BUS-0303	1	480	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00004 + J 0.00004	PU
	Z0 Impedance: 0.00010 + J 0.00010		Ohms/1000 ft		0.00004 + J 0.00004	PU	
CBL-0267	CDP	CBN	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance: 0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0268	CDP	C1K	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance: 0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023	PU	

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH	FEEDER SIZE	FEEDER TYPE
CBL-0269	CDP	CBS	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0270	CDP	CBE	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0271	CBE	C1E	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0272	C1E	C2E	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0273	C2E	C3E	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0274	C3W	C3W1	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0275	EDP-2	MCC 4E	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0276	EDP-2	EBE	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	
CBL-0277	EDP-1	E1W	1	208	1.000 FEET		Copper
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU	

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	FEEDER TYPE	
CBL-0278	E1W	E2W	1	208	1.000	FEET	Copper		
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU			
CBL-0279	E2W	E3W	1	208	1.000	FEET	Copper		
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU			
CBL-0280	EDP-1	MCC 2E	1	208	1.000	FEET	Copper		
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU			
CBL-0281	EDP-1	E1K	1	208	1.000	FEET	Copper		
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU			
CBL-0282	LSDP	LS4E	1	208	1.000	FEET	Copper		
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU			
CBL-0283	LS4E	LS5E	1	208	1.000	FEET	Copper		
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU			
CBL-0284	LS5E	LS6E	1	208	1.000	FEET	Copper		
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU			
CBL-0285	LSDP	LSBE	1	208	1.000	FEET	Copper		
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU			
CBL-0286	LSDP	LSBW	1	208	1.000	FEET	Copper		
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:	0.00010 + J 0.00010	Ohms/1000 ft		0.00023 + J 0.00023	PU			

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-0287	LS6E	LS7E	1	208	1.000	FEET		Copper	
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:		0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
CBL-0288	LSBE	LS1E	1	208	1.000	FEET		Copper	
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:		0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
CBL-0289	LS1E	LS2E	1	208	1.000	FEET		Copper	
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:		0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
CBL-0290	LS2E	LS3E	1	208	1.000	FEET		Copper	
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:		0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
CBL-0291	LSBW	LS1W	1	208	1.000	FEET		Copper	
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:		0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
CBL-0292	LS1W	LS2W	1	208	1.000	FEET		Copper	
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:		0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
CBL-0293	LS2W	LS3W	1	208	1.000	FEET		Copper	
	Duct Material: Non-Magnetic		:0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
	Z0 Impedance:		0.00010 + J 0.00010		Ohms/1000 ft		0.00023 + J 0.00023		PU
CBL-0294	PLEQA	BUS-0339	1	208	80.0	FEET	350	Copper	
	Duct Material: Magnetic								
	+/- Impedance:		0.0378 + J 0.0491		Ohms/1000 ft		6.99 + J 9.08		PU
	Z0 Impedance:		0.1191 + J 0.1209		Ohms/1000 ft		22.02 + J 22.36		PU
CBL-0296	PLEQA	BUS-0340	1	208	80.0	FEET	250	Copper	
	Duct Material: Magnetic								
	+/- Impedance:		0.0552 + J 0.0495		Ohms/1000 ft		10.21 + J 9.15		PU
	Z0 Impedance:		0.1739 + J 0.1219		Ohms/1000 ft		32.16 + J 22.54		PU

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	FEEDER TYPE	
CBL-0298	PLEQA	BUS-0341	1	208	80.0	FEET	250	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0552 + J 0.0495 Ohms/1000 ft						10.21 + J 9.15 PU		
	Z0 Impedance: 0.1739 + J 0.1219 Ohms/1000 ft						32.16 + J 22.54 PU		
CBL-0300	BUS-0338	BUS UTIL	1	12470	75.0	FEET	4/0	Copper	
	Duct Material: Non-Magnetic								
	+/- Impedance: 0.0640 + J 0.0466 Ohms/1000 ft						0.0031 + J 0.0022 PU		
	Z0 Impedance: 0.1017 + J 0.1185 Ohms/1000 ft						0.0049 + J 0.0057 PU		
CBL-0301	SWGR 2	BUS-0342	1	4160	155.0	FEET	2/0	Copper	
	Duct Material: Non-Magnetic		Insulation Type:				XLPE	Insulation Class:	100%/133%
	+/- Impedance: 0.1014 + J 0.0496 Ohms/1000 ft						0.0908 + J 0.0444 PU		
	Z0 Impedance: 0.2856 + J 0.1405 Ohms/1000 ft						0.2558 + J 0.1258 PU		
CBL-0302	ATS 7 Load Sid	BUS-0344	1	4160	75.0	FEET	1/0	Copper	
	Duct Material: Magnetic		Insulation Type:				XLPE	Insulation Class:	133%
	+/- Impedance: 0.1282 + J 0.0604 Ohms/1000 ft						0.0556 + J 0.0262 PU		
	Z0 Impedance: 0.4331 + J 0.1714 Ohms/1000 ft						0.1877 + J 0.0743 PU		
CBL-0303	BUS-0345	7-1LNA	4	208	70.0	FEET	350	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0378 + J 0.0491 Ohms/1000 ft						1.53 + J 1.99 PU		
	Z0 Impedance: 0.1191 + J 0.1209 Ohms/1000 ft						4.82 + J 4.89 PU		
CBL-0304	7-1LNA	7-1LNB	2	208	180.0	FEET	500	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						6.12 + J 9.69 PU		
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						19.26 + J 23.86 PU		
CBL-0305	7-1LNB	7-1NLC	1	208	100.0	FEET	500	Copper	
	Duct Material: Magnetic								
	+/- Impedance: 0.0294 + J 0.0466 Ohms/1000 ft						6.80 + J 10.77 PU		
	Z0 Impedance: 0.0926 + J 0.1147 Ohms/1000 ft						21.40 + J 26.51 PU		
CBL-0306	SWGR 1	BUS-0349	1	4160	155.0	FEET	2/0	Copper	
	Duct Material: Non-Magnetic		Insulation Type:				XLPE	Insulation Class:	100%/133%
	+/- Impedance: 0.1014 + J 0.0496 Ohms/1000 ft						0.0908 + J 0.0444 PU		
	Z0 Impedance: 0.2856 + J 0.1405 Ohms/1000 ft						0.2558 + J 0.1258 PU		

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO NAME	VOLTS L-L	* SECONDARY RECORD NO NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
T 1500 A	MVS 1 D	4160.00	LVA-A YG	480.00	1500.00	1500.00
	Pos. Seq. Z%:	0.660 + J 5.80	(Zpu	0.440 + j 3.87)	Shell Type	
	Zero Seq. Z%:	0.660 + J 5.80	(Sec	0.440 + j 3.87 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T 1500 B	MVS 2 D	4160.00	LVA-B YG	480.00	1500.00	1500.00
	Pos. Seq. Z%:	0.689 + J 5.72	(Zpu	0.459 + j 3.81)	Shell Type	
	Zero Seq. Z%:	0.689 + J 5.72	(Sec	0.459 + j 3.81 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-19-1 LEQA	T 19-1 LEQA D	480.00	19-1LEQA YG	208.00	30.00	30.00
	Pos. Seq. Z%:	0.999 + J 2.72	(Zpu	33.30 + j 90.75)	Shell Type	
	Zero Seq. Z%:	0.999 + J 2.72	(Sec	33.30 + j 90.75 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-19-1 LNA	T 19-1 LNA D	480.00	19-1LNA YG	208.00	30.00	30.00
	Pos. Seq. Z%:	0.999 + J 2.72	(Zpu	33.30 + j 90.75)	Shell Type	
	Zero Seq. Z%:	0.999 + J 2.72	(Sec	33.30 + j 90.75 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-1LCCB	T-1 LCCB PRI D	480.00	T-1 LCCB SEC YG	208.00	150.00	150.00
	Pos. Seq. Z%:	1.15 + J 4.11	(Zpu	7.65 + j 27.42)	Shell Type	
	Zero Seq. Z%:	1.15 + J 4.11	(Sec	7.65 + j 27.42 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-1LLSB	T-1LLSB PRI D	480.00	T-1LLSB SEC YG	208.00	75.00	75.00
	Pos. Seq. Z%:	1.28 + J 4.05	(Zpu	17.12 + j 54.02)	Shell Type	
	Zero Seq. Z%:	1.28 + J 4.05	(Sec	17.12 + j 54.02 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO NAME	VOLTS L-L	* SECONDARY RECORD NO NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
T-1LNB	T-1LNB PRI D	480.00	T-1LNB SEC YG	208.00	150.00	150.00
	Pos. Seq. Z%:	1.15 + J 4.11	(Zpu	7.65 + j 27.42)	Shell Type	
	Zero Seq. Z%:	1.15 + J 4.11	(Sec	7.65 + j 27.42 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-2LEQB	T-2LEQB PRI D	480.00	T-2 LEQB SEC YG	208.00	45.00	45.00
	Pos. Seq. Z%:	1.58 + J 4.58	(Zpu	35.06 + j 101.6)	Shell Type	
	Zero Seq. Z%:	1.58 + J 4.58	(Sec	35.06 + j 101.6 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-2LNB	T-2LNB PRI D	480.00	T-2LNB SEC YG	208.00	45.00	45.00
	Pos. Seq. Z%:	1.58 + J 4.58	(Zpu	35.06 + j 101.6)	Shell Type	
	Zero Seq. Z%:	1.58 + J 4.58	(Sec	35.06 + j 101.6 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-3LCCB	T-3LCCB PRI D	480.00	T-3LCCB SEC YG	208.00	75.00	75.00
	Pos. Seq. Z%:	1.28 + J 4.05	(Zpu	17.12 + j 54.02)	Shell Type	
	Zero Seq. Z%:	1.28 + J 4.05	(Sec	17.12 + j 54.02 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-3LLSB	T-3LLSB PRI D	480.00	T-3LLSB SEC YG	208.00	30.00	30.00
	Pos. Seq. Z%:	1.23 + J 3.35	(Zpu	41.00 + j 111.7)	Shell Type	
	Zero Seq. Z%:	1.23 + J 3.35	(Sec	41.00 + j 111.7 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-3LNB	T-3LNB PRI D	480.00	T-3LNB SEC YG	208.00	45.00	45.00
	Pos. Seq. Z%:	1.58 + J 4.58	(Zpu	35.06 + j 101.6)	Shell Type	
	Zero Seq. Z%:	1.58 + J 4.58	(Sec	35.06 + j 101.6 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO NAME	VOLTS L-L	* SECONDARY RECORD NO NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
T3 XFMR	BUS-0344 D	4160.00	BUS-0345 YG	208.00	300.00	300.00
	Pos. Seq. Z%:	1.22 + J 5.06	(Zpu 4.06 + j 16.85)		Shell Type	
	Zero Seq. Z%:	1.22 + J 5.06	(Sec 4.06 + j 16.85 Pri		Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-4LEQB	T-4LEQB PRI D	480.00	T-4LEQB SEC YG	208.00	45.00	45.00
	Pos. Seq. Z%:	1.58 + J 4.58	(Zpu 35.06 + j 101.6)		Shell Type	
	Zero Seq. Z%:	1.58 + J 4.58	(Sec 35.06 + j 101.6 Pri		Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-4LNB	T-4LNB PRI D	480.00	T-4LNB SEC YG	208.00	45.00	45.00
	Pos. Seq. Z%:	1.58 + J 4.58	(Zpu 35.06 + j 101.6)		Shell Type	
	Zero Seq. Z%:	1.58 + J 4.58	(Sec 35.06 + j 101.6 Pri		Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-5LCCB	T-5LCCB PRI D	480.00	T-5LCCB SEC YG	208.00	75.00	75.00
	Pos. Seq. Z%:	1.28 + J 4.05	(Zpu 17.12 + j 54.02)		Shell Type	
	Zero Seq. Z%:	1.28 + J 4.05	(Sec 17.12 + j 54.02 Pri		Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-5LLSB	T-5LLSB PRI D	480.00	T-5LLSB SEC YG	208.00	30.00	30.00
	Pos. Seq. Z%:	1.23 + J 3.35	(Zpu 41.00 + j 111.7)		Shell Type	
	Zero Seq. Z%:	1.23 + J 3.35	(Sec 41.00 + j 111.7 Pri		Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-5LNB	T-5LNB PRI D	480.00	T-5LNB SEC YG	208.00	45.00	45.00
	Pos. Seq. Z%:	1.58 + J 4.58	(Zpu 35.06 + j 101.6)		Shell Type	
	Zero Seq. Z%:	1.58 + J 4.58	(Sec 35.06 + j 101.6 Pri		Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO NAME	VOLTS L-L	* SECONDARY RECORD NO NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
T-6LEQB	T-6LEQB PRI	D 480.00	T-6LEQB SEC	YG 208.00	45.00	45.00
	Pos. Seq. Z%:	2.85 + J 3.91	(Zpu	63.30 + j 86.96)	Shell Type	
	Zero Seq. Z%:	2.85 + J 3.91	(Sec	63.30 + j 86.96 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-6LNB	T-6LNB PRI	D 480.00	T-6LNB SEC	YG 208.00	45.00	45.00
	Pos. Seq. Z%:	1.58 + J 4.58	(Zpu	35.06 + j 101.6)	Shell Type	
	Zero Seq. Z%:	1.58 + J 4.58	(Sec	35.06 + j 101.6 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T 750 CAST	T 750 CAST PRI	D 480.00	T 750 CAST SEC	YG 208.00	750.00	750.00
	Pos. Seq. Z%:	2.60 + J 5.13	(Zpu	3.47 + j 6.84)	Shell Type	
	Zero Seq. Z%:	2.60 + J 5.13	(Sec	3.47 + j 6.84 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-BLCCA	T- BLCCA PRI	D 480.00	T-BLCCA SEC	YG 208.00	300.00	300.00
	Pos. Seq. Z%:	1.34 + J 5.56	(Zpu	4.47 + j 18.54)	Shell Type	
	Zero Seq. Z%:	1.34 + J 5.56	(Sec	4.47 + j 18.54 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-BLCCB	T-BLCCB PRI	D 480.00	T-BLCCB SEC	YG 208.00	300.00	300.00
	Pos. Seq. Z%:	1.34 + J 5.56	(Zpu	4.47 + j 18.54)	Shell Type	
	Zero Seq. Z%:	1.34 + J 5.56	(Sec	4.47 + j 18.54 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-BLEQA	T-BLEQA PRI	D 480.00	T-BLEQA SEC	YG 208.00	500.00	500.00
	Pos. Seq. Z%:	1.43 + J 6.69	(Zpu	2.85 + j 13.38)	Shell Type	
	Zero Seq. Z%:	1.43 + J 6.69	(Sec	2.85 + j 13.38 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO NAME	VOLTS L-L	* SECONDARY RECORD NO NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
T-BLEQB	T-BLEQB PRI	D 480.00	T-BLEQB SEC	YG 208.00	75.00	75.00
	Pos. Seq. Z%:	1.28 + J 4.05	(Zpu	17.12 + j 54.02)	Shell Type	
	Zero Seq. Z%:	1.28 + J 4.05	(Sec	17.12 + j 54.02 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-BLLSA	T-BLLSA PRI	D 480.00	T-BLLSA SEC	YG 208.00	150.00	150.00
	Pos. Seq. Z%:	1.15 + J 4.11	(Zpu	7.65 + j 27.42)	Shell Type	
	Zero Seq. Z%:	1.15 + J 4.11	(Sec	7.65 + j 27.42 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-BLNA	T-BLNA PRI	D 480.00	T-BLNA SEC	YG 208.00	500.00	500.00
	Pos. Seq. Z%:	1.43 + J 6.69	(Zpu	2.85 + j 13.38)	Shell Type	
	Zero Seq. Z%:	1.43 + J 6.69	(Sec	2.85 + j 13.38 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T-PLEQA	T-PLEQA PRI	D 480.00	T-PLEQA SEC	YG 208.00	225.00	225.00
	Pos. Seq. Z%:	1.93 + J 7.54	(Zpu	8.60 + j 33.49)	Shell Type	
	Zero Seq. Z%:	1.93 + J 7.54	(Sec	8.60 + j 33.49 Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		30.00 Deg.	
T X-RAY	T X-RAY PRI	D 208.00	T X-RAY SEC	D 480.00	225.00	225.00
	Pos. Seq. Z%:	0.005 + J 5.75	(Zpu	0.025 + j 25.56)	Shell Type	
	Zero Seq. Z%:	9999. + J 9999.	(Pri	Open, Sec Open)		
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		0.000 Deg.	
XFMR UTIL 1	BUS UTIL	Y 12470.0	BUS-0002	YG 4160.00	2500.00	2500.00
	Pos. Seq. Z%:	0.551 + J 5.77	(Zpu	0.220 + j 2.31)	Shell Type	
	Zero Seq. Z%:	9999. + J 9999.	(Sec	3999. + j 3999. Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):		0.000 Deg.	

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO NAME	VOLTS L-L	* SECONDARY RECORD NO NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
XFMR UTIL 2	BUS UTIL Y	12470.0	BUS-0004 YG	4160.00	2500.00	2500.00
	Pos. Seq. Z%:	0.551 + J 5.77	(Zpu	0.220 + j 2.31)	Shell Type	
	Zero Seq. Z%:	9999. + J 9999.	(Sec	3999. + j 3999. Pri	Open)	
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leads Sec.):	0.000 Deg.		

UPS INPUT DATA

UPS NAME	UPS FROM NAME	UPS TO NAME	VOLTS	RATING	--CONTRIBUTION% OF RATING-- THREE PHASE	LINE-G	X/R	-----BYPASS IMPEDANCE------ Z1%	X1/R1	Z0%	X0/R0
UPS TEL RM	UPS TEL-RM	BUS-0047	208	80	0	0	8	0.1	8	0.1	8

GENERATION CONTRIBUTION DATA

BUS NAME	CONTRIBUTION NAME	VOLTAGE L-L	MVA	X"d	X/R		
BUS-0338	UTILITY	12470.0	123.83				
	Three Phase		Contribution:	5733.00 AMPS		5.12	
	Single Line to Ground		Contribution:	725.00 AMPS		5.12	
	Pos Sequence Impedance (100 MVA Base)			0.1547 + J	0.7926 PU		
	Zero Sequence Impedance (100 MVA Base)			3.36 + J	17.22 PU		
BUS GEN LV 1	GEN LV 1	480.00	1.000	0.1500	20.00		
	KG: 0.9174	xdsat:	1.60	Excitation Limit:	1.30	Ik -	ON
	Pos Sequence Impedance (100 MVA Base)			0.7500 + J	15.00 PU		
BUS GEN LV 2	GEN LV 2	480.00	1.000	0.1500	20.00		
	KG: 0.9174	xdsat:	1.60	Excitation Limit:	1.30	Ik -	ON
	Pos Sequence Impedance (100 MVA Base)			0.7500 + J	15.00 PU		

MOTOR CONTRIBUTION DATA

BUS NAME	CONTRIBUTION NAME	VOLTAGE L-L	BASE kVA	X"d	X/R	Motor Number
BUS-0180	CU-1	208	100.27	0.1700	8.56	1.00
	Pos Sequence Impedance (100 MVA Base)			19.81 + j	169.54 PU	
BUS-0339	P1	208	75.20	0.1682	6.80	1.00
	Pos Sequence Impedance (100 MVA Base)			32.89 + j	223.65 PU	
BUS-0340	P2	208	50.13	0.1672	5.40	1.00
	Pos Sequence Impedance (100 MVA Base)			61.74 + j	333.42 PU	
BUS-0341	S3	208	50.13	0.1672	5.40	1.00
	Pos Sequence Impedance (100 MVA Base)			61.74 + j	333.42 PU	
BUS ELEVATOR	MTRI-0005	208	20.05	0.1692	10.0	1.00
	Pos Sequence Impedance (100 MVA Base)			84.35 + j	843.51 PU	

B. APPENDIX B - SHORT-CIRCUIT RESULTS – UTILITY CONTRIBUTION

VA Clarksburg
Utility Contribution

Nov 28, 2012 15:09:18B-1

ALL INFORMATION PRESENTED IS FOR REVIEW, APPROVAL
INTERPRETATION AND APPLICATION BY A REGISTERED ENGINEER ONLY
SKM DISCLAIMS ANY RESPONSIBILITY AND LIABILITY RESULTING
FROM THE USE AND INTERPRETATION OF THIS SOFTWARE.

SKM POWER*TOOLS FOR WINDOWS
A_FAULT SHORT CIRCUIT ANALYSIS REPORT

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

```
 1 HNB          3P Duty: 14.527 KA AT  -75.82 DEG (  12.08 MVA)  X/R:     4.00
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0047 + J  0.0185  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   14.527 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  15.411 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  14.527 KA
                CBL-0178        BHNB             14.527 KA      ANG:   -75.82

 19-1LEQA       3P Duty:  2.610 KA AT  -67.14 DEG (   0.94 MVA)  X/R:     2.37
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0179 + J  0.0424  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.610 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.841 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.610 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.610 KA
                T-19-1 LEQA     T 19-1 LEQA        2.610 KA      ANG:   112.86

 19-1LNA        3P Duty:  2.656 KA AT  -69.29 DEG (   0.96 MVA)  X/R:     2.65
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0160 + J  0.0423  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.656 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.980 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.656 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.656 KA
                T-19-1 LNA      T 19-1 LNA         2.656 KA      ANG:   110.71

 1CA            3P Duty:  1.991 KA AT  -28.95 DEG (   0.72 MVA)  X/R:     0.55
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0528 + J  0.0292  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.991 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.991 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.991 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.991 KA
                CBL-0168        1LNA             1.991 KA      ANG:   -28.95

 1CB            3P Duty:  4.034 KA AT  -50.69 DEG (   1.45 MVA)  X/R:     1.22
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0189 + J  0.0230  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.034 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.034 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.034 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.034 KA
                CBL-0163        1LNA             4.034 KA      ANG:   -50.69

 1CC            3P Duty:  2.311 KA AT  -30.48 DEG (   0.83 MVA)  X/R:     0.59
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0448 + J  0.0263  OHMS
```

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

```
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.311 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.311 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.311 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.311 KA
                CBL-0167        1LNA              2.311 KA      ANG:   -30.48

 1CD            3P Duty:  3.831 KA AT  -50.03 DEG (   1.38 MVA)  X/R:     1.19
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0201 + J  0.0240  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.831 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.831 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.831 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.831 KA
                CBL-0164        1CB               3.831 KA      ANG:   -50.03

 1HCCB          3P Duty: 14.160 KA AT  -75.32 DEG (  11.77 MVA)  X/R:     3.85
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0050 + J  0.0189  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   14.160 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  14.885 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  14.160 KA
                CBL-0231        BHCCB            14.160 KA      ANG:   -75.32

 1HLSB          3P Duty:  9.150 KA AT  -68.42 DEG (   7.61 MVA)  X/R:     2.54
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0111 + J  0.0282  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.150 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   9.150 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.150 KA
                CBL-0137        BHLSB             9.150 KA      ANG:   -68.42

 1LCCA          3P Duty:  7.481 KA AT  -69.70 DEG (   2.70 MVA)  X/R:     2.71
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0056 + J  0.0151  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.481 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.449 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.481 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.481 KA
                CBL-0197        BLCCA             7.481 KA      ANG:   -69.70

 1LCCB          3P Duty:  7.206 KA AT  -73.72 DEG (   2.60 MVA)  X/R:     3.43
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0047 + J  0.0160  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.206 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.675 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.352 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.206 KA
                CBL-0233        T-1 LCCB SEC      7.206 KA      ANG:   -73.72
```

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

```
 1LCCC          3P Duty:  2.782 KA AT  -38.61 DEG (   1.00 MVA)  X/R:     0.80
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0337 + J  0.0269  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.782 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.782 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.782 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.782 KA
                CBL-0198        1LCCA              2.782 KA      ANG:   -38.61

 1LCCD          3P Duty:  4.038 KA AT  -57.01 DEG (   1.45 MVA)  X/R:     1.54
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0162 + J  0.0249  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.038 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.038 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.038 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.038 KA
                CBL-0236        1LCCB              4.038 KA      ANG:   -57.01

 1LCCE          3P Duty:  3.937 KA AT  -56.51 DEG (   1.42 MVA)  X/R:     1.51
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0168 + J  0.0254  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.937 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.937 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.937 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.937 KA
                CBL-0237        1LCCD              3.937 KA      ANG:   -56.51

 1LEQA          3P Duty:  7.349 KA AT  -68.82 DEG (   2.65 MVA)  X/R:     2.58
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0059 + J  0.0152  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.349 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.193 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.349 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.349 KA
                CBL-0083        BLEQA              7.349 KA      ANG:   -68.82

 1LEQB          3P Duty:  2.244 KA AT  -67.86 DEG (   0.81 MVA)  X/R:     2.46
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0202 + J  0.0496  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.244 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.467 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.244 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.244 KA
                CBL-0100        2LEQB              2.244 KA      ANG:   -67.86

 1LLSA          3P Duty:  4.107 KA AT  -59.04 DEG (   1.48 MVA)  X/R:     1.67
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0150 + J  0.0251  OHMS
```

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

```
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.107 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.107 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.107 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.107 KA
                CBL-0121        BLLSA              4.107 KA      ANG:   -59.04

 1LLSB          3P Duty:  3.884 KA AT  -71.08 DEG (   1.40 MVA)  X/R:     2.92
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0100 + J  0.0292  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.884 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.478 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.884 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.884 KA
                CBL-0135        T-1LLSB SEC        3.884 KA      ANG:   -71.08

 1LLSC          3P Duty:  2.261 KA AT  -40.07 DEG (   0.81 MVA)  X/R:     0.84
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0406 + J  0.0342  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.261 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.261 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.261 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.261 KA
                CBL-0125        1LLSA              2.261 KA      ANG:   -40.07

 1LLSD          3P Duty:  2.168 KA AT  -45.50 DEG (   0.78 MVA)  X/R:     1.02
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0388 + J  0.0395  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.168 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.168 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.168 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.168 KA
                CBL-0140        1LLSB              2.168 KA      ANG:   -45.50

 1LNA           3P Duty:  9.232 KA AT  -68.46 DEG (   3.33 MVA)  X/R:     2.54
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0048 + J  0.0121  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.232 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   9.232 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.232 KA
                CBL-0162        BLNA               9.232 KA      ANG:   -68.46

 1LNB           3P Duty:  7.375 KA AT  -74.21 DEG (   2.66 MVA)  X/R:     3.54
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0044 + J  0.0157  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.375 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.954 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.589 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.375 KA
                CBL-0177        T-1LNB SEC         7.375 KA      ANG:   -74.21
```

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

```
 1LNC           3P Duty:  3.210 KA AT  -42.75 DEG (   1.16 MVA)  X/R:     0.92
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0275 + J  0.0254  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.210 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.210 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.210 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.210 KA
                CBL-0179        1LNB              3.210 KA      ANG:   -42.75

 1WC            3P Duty:  3.736 KA AT  -49.73 DEG (   1.35 MVA)  X/R:     1.18
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0208 + J  0.0245  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.736 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.736 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.736 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.736 KA
                CBL-0165        1LNA              3.736 KA      ANG:   -49.73

 2HEQA          3P Duty: 10.579 KA AT  -70.58 DEG (   8.80 MVA)  X/R:     2.85
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0087 + J  0.0247  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   10.579 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  10.579 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  10.579 KA
                CBL-0208        BHEQA            10.579 KA      ANG:   -70.58

 2HEQB          3P Duty: 12.993 KA AT  -73.76 DEG (  10.80 MVA)  X/R:     3.46
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0060 + J  0.0205  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   12.993 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  13.284 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  12.993 KA
                CBL-0099        BHEQB            12.993 KA      ANG:   -73.76

 2HNA           3P Duty: 10.485 KA AT  -70.56 DEG (   8.72 MVA)  X/R:     2.84
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0088 + J  0.0249  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   10.485 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  10.485 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  10.485 KA
                CBL-0205        BHNA             10.485 KA      ANG:   -70.56

 2HNB           3P Duty: 13.768 KA AT  -74.85 DEG (  11.45 MVA)  X/R:     3.73
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0053 + J  0.0194  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   13.768 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  14.351 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  13.768 KA
                CBL-0183        BHNB             13.768 KA      ANG:   -74.85
```

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

```
 2LCCA          3P Duty:  7.215 KA AT  -69.07 DEG (   2.60 MVA)  X/R:     2.62
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0059 + J  0.0155  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.215 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.072 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.215 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.215 KA
                CBL-0201        1LCCA             7.215 KA      ANG:   -69.07

 2LCCB          3P Duty:  6.774 KA AT  -72.74 DEG (   2.44 MVA)  X/R:     3.22
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0053 + J  0.0169  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.774 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.022 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.799 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.774 KA
                CBL-0238        1LCCB             6.774 KA      ANG:   -72.74

 2LCCC          3P Duty:  3.796 KA AT  -53.66 DEG (   1.37 MVA)  X/R:     1.36
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0187 + J  0.0255  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.796 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.796 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.796 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.796 KA
                CBL-0202        2LCCA             3.796 KA      ANG:   -53.66

 2LCCD          3P Duty:  3.657 KA AT  -52.42 DEG (   1.32 MVA)  X/R:     1.30
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0200 + J  0.0260  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.657 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.657 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.657 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.657 KA
                CBL-0203        2LCCC             3.657 KA      ANG:   -52.42

 2LCCE          3P Duty:  3.431 KA AT  -45.66 DEG (   1.24 MVA)  X/R:     1.02
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0245 + J  0.0250  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.431 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.431 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.431 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.431 KA
                CBL-0240        2LCCB             3.431 KA      ANG:   -45.66

 2LCCF          3P Duty:  3.431 KA AT  -45.66 DEG (   1.24 MVA)  X/R:     1.02
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0245 + J  0.0250  OHMS
```

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

```
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.431 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.431 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.431 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.431 KA
                CBL-0241        2LCCB              3.431 KA      ANG:   -45.66

 2LEQA          3P Duty:  6.893 KA AT  -68.13 DEG (   2.48 MVA)  X/R:     2.49
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0065 + J  0.0162  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.893 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.608 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.893 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.893 KA
                CBL-0084        1LEQA              6.893 KA      ANG:   -68.13

 2LEQB          3P Duty:  2.328 KA AT  -70.04 DEG (   0.84 MVA)  X/R:     2.75
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0176 + J  0.0485  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.328 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.642 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.328 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.328 KA
                CBL-0098        T-2 LEQB SEC       2.328 KA      ANG:   -70.04

 2LLSA          3P Duty:  3.905 KA AT  -57.95 DEG (   1.41 MVA)  X/R:     1.60
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0163 + J  0.0261  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.905 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.905 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.905 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.905 KA
                CBL-0123        1LLSA              3.905 KA      ANG:   -57.95

 2LLSB          3P Duty:  3.624 KA AT  -66.48 DEG (   1.31 MVA)  X/R:     2.30
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0132 + J  0.0304  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.624 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.910 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.624 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.624 KA
                CBL-0141        1LLSB              3.624 KA      ANG:   -66.48

 2LLSC          3P Duty:  1.964 KA AT  -37.79 DEG (   0.71 MVA)  X/R:     0.78
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0483 + J  0.0375  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.964 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.964 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.964 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.964 KA
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                CONTRIBUTIONS TO  2LLSC          (CONTINUED)
                CBL-0124        2LLSA             1.964 KA      ANG:   -37.79

 2LLSD          3P Duty:  2.386 KA AT  -49.89 DEG (   0.86 MVA)  X/R:     1.19
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0324 + J  0.0385  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.386 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.386 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.386 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.386 KA
                CBL-0142        2LLSB             2.386 KA      ANG:   -49.89

 2LNA           3P Duty:  8.827 KA AT  -67.74 DEG (   3.18 MVA)  X/R:     2.44
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0052 + J  0.0126  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.827 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   9.690 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   8.827 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.827 KA
                CBL-0166        1LNA              8.827 KA      ANG:   -67.74

 2LNB           3P Duty:  2.339 KA AT  -70.10 DEG (   0.84 MVA)  X/R:     2.76
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0175 + J  0.0483  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.339 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.656 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.339 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.339 KA
                CBL-0182        T-2LNB SEC        2.339 KA      ANG:   -70.10

 3A EM          3P Duty:  2.501 KA AT  -38.01 DEG (   0.90 MVA)  X/R:     0.78
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0378 + J  0.0296  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.501 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.501 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.501 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.501 KA
                CBL-0216        3LCCA             2.501 KA      ANG:   -38.01

 3A1            3P Duty:  3.868 KA AT  -64.62 DEG (   1.39 MVA)  X/R:     2.11
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0133 + J  0.0281  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.868 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.076 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.868 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.868 KA
                CBL-0211        BLCCA             3.868 KA      ANG:   -64.62

 3HCCB          3P Duty: 12.299 KA AT  -68.63 DEG (  10.23 MVA)  X/R:     2.57
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0082 + J  0.0210  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   12.299 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  12.299 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  12.299 KA
                CBL-0242        BHCCB            12.299 KA      ANG:   -68.63

 3HLSB          3P Duty:  7.644 KA AT  -57.54 DEG (   6.36 MVA)  X/R:     1.58
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0195 + J  0.0306  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.644 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.644 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.644 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.644 KA
                CBL-0147        BHLSB             7.644 KA      ANG:   -57.54

 3HNB           3P Duty: 13.082 KA AT  -73.97 DEG (  10.88 MVA)  X/R:     3.51
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0058 + J  0.0204  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   13.082 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  13.427 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  13.082 KA
                CBL-0187        BHNB             13.082 KA      ANG:   -73.97

 3LCCA          3P Duty:  5.960 KA AT  -68.37 DEG (   2.15 MVA)  X/R:     2.53
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0074 + J  0.0187  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.960 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.601 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.960 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.960 KA
                CBL-0214        BLCCA             5.960 KA      ANG:   -68.37

 3LCCB          3P Duty:  4.076 KA AT  -71.24 DEG (   1.47 MVA)  X/R:     2.95
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0095 + J  0.0279  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.076 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.711 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.076 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.076 KA
                CBL-0244        T-3LCCB SEC       4.076 KA      ANG:   -71.24

 3LCCC          3P Duty:  4.148 KA AT  -58.55 DEG (   1.49 MVA)  X/R:     1.64
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0151 + J  0.0247  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.148 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.148 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.148 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.148 KA
                CBL-0215        3LCCA             4.148 KA      ANG:   -58.55
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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 3LEQA          3P Duty:  6.893 KA AT  -68.13 DEG (   2.48 MVA)  X/R:     2.49
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0065 + J  0.0162  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.893 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.608 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.893 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.893 KA
                CBL-0085        BLEQA             6.893 KA      ANG:   -68.13

 3LEQB          3P Duty:  2.232 KA AT  -67.80 DEG (   0.80 MVA)  X/R:     2.45
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0203 + J  0.0498  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.232 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.452 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.232 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.232 KA
                CBL-0104        4LEQB             2.232 KA      ANG:   -67.80

 3LLSA          3P Duty:  3.905 KA AT  -57.95 DEG (   1.41 MVA)  X/R:     1.60
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0163 + J  0.0261  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.905 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.905 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.905 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.905 KA
                CBL-0126        BLLSA             3.905 KA      ANG:   -57.95

 3LLSB          3P Duty:  2.014 KA AT  -66.69 DEG (   0.73 MVA)  X/R:     2.32
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0236 + J  0.0548  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.014 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.179 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.014 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.014 KA
                CBL-0146        T-3LLSB SEC       2.014 KA      ANG:   -66.69

 3LLSC          3P Duty:  1.913 KA AT  -37.30 DEG (   0.69 MVA)  X/R:     0.76
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0499 + J  0.0380  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.913 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.913 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.913 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.913 KA
                CBL-0127        3LLSA             1.913 KA      ANG:   -37.30

 3LLSD          3P Duty:  1.516 KA AT  -53.07 DEG (   0.55 MVA)  X/R:     1.33
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0476 + J  0.0633  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    1.516 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.516 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.516 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.516 KA
                CBL-0148        3LLSB              1.516 KA      ANG:   -53.07

 3LNA           3P Duty:  6.765 KA AT  -66.99 DEG (   2.44 MVA)  X/R:     2.36
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0069 + J  0.0163  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.765 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.350 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.765 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.765 KA
                CBL-0169        BLNA               6.765 KA      ANG:   -66.99

 3LNB           3P Duty:  2.330 KA AT  -70.05 DEG (   0.84 MVA)  X/R:     2.76
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0176 + J  0.0485  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.330 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.644 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.330 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.330 KA
                CBL-0186        T-3LNB SEC         2.330 KA      ANG:   -70.05

 3LNC           3P Duty:  4.503 KA AT  -56.76 DEG (   1.62 MVA)  X/R:     1.53
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0146 + J  0.0223  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.503 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.503 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.503 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.503 KA
                CBL-0170        3LNA               4.503 KA      ANG:   -56.76

 4AD            3P Duty:  3.996 KA AT  -58.52 DEG (   1.44 MVA)  X/R:     1.63
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0157 + J  0.0256  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.996 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.996 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.996 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.996 KA
                CBL-0219        4C                 3.996 KA      ANG:   -58.52

 4C             3P Duty:  3.996 KA AT  -58.52 DEG (   1.44 MVA)  X/R:     1.63
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0157 + J  0.0256  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.996 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.996 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.996 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.996 KA
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

CONTRIBUTIONS TO 4C (CONTINUED)
CBL-0218 4LCCA 3.996 KA ANG: -58.52

4DP 3P Duty: 3.613 KA AT -64.17 DEG (1.30 MVA) X/R: 2.07
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0145 + J 0.0299 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 3.613 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 3.786 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 3.613 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 3.613 KA
CBL-0220 BLCCA 3.613 KA ANG: -64.17

4EML 3P Duty: 3.360 KA AT -60.34 DEG (1.21 MVA) X/R: 1.76
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0177 + J 0.0311 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 3.360 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 3.373 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 3.360 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 3.360 KA
CBL-0221 4DP 3.360 KA ANG: -60.34

4HEQA 3P Duty: 10.162 KA AT -70.07 DEG (8.45 MVA) X/R: 2.77
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0093 + J 0.0256 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 10.162 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 10.162 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 10.162 KA
CBL-0209 BHEQA 10.162 KA ANG: -70.07

4HEQB 3P Duty: 12.090 KA AT -72.62 DEG (10.05 MVA) X/R: 3.21
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0068 + J 0.0219 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 12.090 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 12.125 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 12.090 KA
CBL-0103 BHEQB 12.090 KA ANG: -72.62

4HNA 3P Duty: 6.932 KA AT -66.18 DEG (5.76 MVA) X/R: 2.27
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0161 + J 0.0366 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 6.932 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 7.453 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 6.932 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 6.932 KA
CBL-0206 BHNA 6.932 KA ANG: -66.18

4HNB 3P Duty: 12.459 KA AT -73.18 DEG (10.36 MVA) X/R: 3.33
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0064 + J 0.0213 OHMS

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER   12.459 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  12.615 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  12.459 KA
                CBL-0190        BHNB              12.459 KA      ANG:   -73.18

 4L             3P Duty:  3.502 KA AT  -62.64 DEG (   1.26 MVA)  X/R:     1.93
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0158 + J  0.0305  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.502 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.604 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.502 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.502 KA
                CBL-0222        4DP               3.502 KA      ANG:   -62.64

 4LA            3P Duty:  3.484 KA AT  -62.19 DEG (   1.26 MVA)  X/R:     1.90
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0161 + J  0.0305  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.484 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.567 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.484 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.484 KA
                CBL-0223        4DP               3.484 KA      ANG:   -62.19

 4LCCA          3P Duty:  5.656 KA AT  -67.82 DEG (   2.04 MVA)  X/R:     2.46
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0080 + J  0.0197  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.656 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.216 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.656 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.656 KA
                CBL-0217        3LCCA             5.656 KA      ANG:   -67.82

 4LCCB          3P Duty:  3.827 KA AT  -67.45 DEG (   1.38 MVA)  X/R:     2.41
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0120 + J  0.0290  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.827 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.184 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.827 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.827 KA
                CBL-0246        3LCCB             3.827 KA      ANG:   -67.45

 4LEQA          3P Duty:  6.489 KA AT  -67.51 DEG (   2.34 MVA)  X/R:     2.42
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0071 + J  0.0171  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.489 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.100 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.489 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.489 KA
                CBL-0086        3LEQA             6.489 KA      ANG:   -67.51
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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 4LEQB          3P Duty:  2.315 KA AT  -69.96 DEG (   0.83 MVA)  X/R:     2.74
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0178 + J  0.0487  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.315 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.624 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.315 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.315 KA
                CBL-0102        T-4LEQB SEC        2.315 KA      ANG:   -69.96

 4LEQC          3P Duty:  4.046 KA AT  -55.82 DEG (   1.46 MVA)  X/R:     1.47
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0167 + J  0.0246  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.046 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.046 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.046 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.046 KA
                CBL-0087        4LEQA              4.046 KA      ANG:   -55.82

 4LLSA          3P Duty:  3.720 KA AT  -56.96 DEG (   1.34 MVA)  X/R:     1.54
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0176 + J  0.0271  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.720 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.720 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.720 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.720 KA
                CBL-0128        3LLSA              3.720 KA      ANG:   -56.96

 4LLSB          3P Duty:  1.937 KA AT  -64.39 DEG (   0.70 MVA)  X/R:     2.09
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0268 + J  0.0559  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.937 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.035 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.937 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.937 KA
                CBL-0149        3LLSB              1.937 KA      ANG:   -64.39

 4LLSC          3P Duty:  2.193 KA AT  -40.56 DEG (   0.79 MVA)  X/R:     0.86
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0416 + J  0.0356  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.193 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.193 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.193 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.193 KA
                CBL-0129        4LLSA              2.193 KA      ANG:   -40.56

 4LLSD          3P Duty:  1.390 KA AT  -49.96 DEG (   0.50 MVA)  X/R:     1.19
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0556 + J  0.0662  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    1.390 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.390 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.390 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.390 KA
                CBL-0150        4LLSB              1.390 KA      ANG:   -49.96

 4LNA           3P Duty:  6.374 KA AT  -66.45 DEG (   2.30 MVA)  X/R:     2.30
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0075 + J  0.0173  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.374 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.876 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.374 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.374 KA
                CBL-0171        3LNA               6.374 KA      ANG:   -66.45

 4LNB           3P Duty:  2.321 KA AT  -70.00 DEG (   0.84 MVA)  X/R:     2.75
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0177 + J  0.0486  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.321 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.632 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.321 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.321 KA
                CBL-0189        T-4LNB SEC         2.321 KA      ANG:   -70.00

 4LNC           3P Duty:  3.259 KA AT  -43.51 DEG (   1.17 MVA)  X/R:     0.95
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0267 + J  0.0254  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.259 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.259 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.259 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.259 KA
                CBL-0172        4LNA               3.259 KA      ANG:   -43.51

 5HCCB          3P Duty: 10.923 KA AT  -64.88 DEG (   9.08 MVA)  X/R:     2.14
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0108 + J  0.0230  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   10.923 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  10.923 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  10.923 KA
                CBL-0247        BHCCB             10.923 KA      ANG:   -64.88

 5HLSB          3P Duty:  6.626 KA AT  -51.80 DEG (   5.51 MVA)  X/R:     1.27
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0259 + J  0.0329  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.626 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.626 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.626 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.626 KA
                CBL-0153        BHLSB              6.626 KA      ANG:   -51.80
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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 5HNB          3P Duty: 11.890 KA AT  -72.46 DEG (   9.89 MVA)  X/R:     3.18
               VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0070 + J  0.0222  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER   11.890 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA  11.895 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA  11.890 KA
               CBL-0193        BHNB             11.890 KA      ANG:   -72.46

 5LCCA         3P Duty:  5.584 KA AT  -67.70 DEG (   2.01 MVA)  X/R:     2.44
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0082 + J  0.0199  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    5.584 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   6.127 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   5.584 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   5.584 KA
               CBL-0226        BLCCA             5.584 KA      ANG:   -67.70

 5LCCB         3P Duty:  4.009 KA AT  -70.58 DEG (   1.44 MVA)  X/R:     2.84
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0100 + J  0.0283  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    4.009 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   4.587 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   4.009 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   4.009 KA
               CBL-0249        T-5LCCB SEC       4.009 KA      ANG:   -70.58

 5LEQA         3P Duty:  6.395 KA AT  -67.37 DEG (   2.30 MVA)  X/R:     2.40
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0072 + J  0.0173  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    6.395 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   6.984 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   6.395 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   6.395 KA
               CBL-0088        BLEQA             6.395 KA      ANG:   -67.37

 5LEQB         3P Duty:  2.220 KA AT  -53.57 DEG (   0.80 MVA)  X/R:     1.35
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0321 + J  0.0435  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    2.220 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   2.220 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   2.220 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   2.220 KA
               CBL-0109        6LEQB             2.220 KA      ANG:   -53.57

 5LLSA         3P Duty:  3.720 KA AT  -56.96 DEG (   1.34 MVA)  X/R:     1.54
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0176 + J  0.0271  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    3.720 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.720 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.720 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.720 KA
                CBL-0130        BLLSA              3.720 KA      ANG:   -56.96

 5LLSB          3P Duty:  1.985 KA AT  -65.81 DEG (   0.72 MVA)  X/R:     2.23
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0248 + J  0.0552  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.985 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.123 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.985 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.985 KA
                CBL-0152        T-5LLSB SEC        1.985 KA      ANG:   -65.81

 5LNA           3P Duty:  6.284 KA AT  -66.33 DEG (   2.26 MVA)  X/R:     2.28
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0077 + J  0.0175  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.284 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.767 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.284 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.284 KA
                CBL-0173        BLNA               6.284 KA      ANG:   -66.33

 5LNB           3P Duty:  2.312 KA AT  -69.95 DEG (   0.83 MVA)  X/R:     2.74
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0178 + J  0.0488  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.312 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.620 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.312 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.312 KA
                CBL-0192        T-5LNB SEC         2.312 KA      ANG:   -69.95

 6HEQA          3P Duty:  9.684 KA AT  -69.48 DEG (   8.05 MVA)  X/R:     2.68
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0100 + J  0.0268  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.684 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   9.684 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.684 KA
                CBL-0210        BHEQA              9.684 KA      ANG:   -69.48

 6HEQB          3P Duty: 11.059 KA AT  -71.33 DEG (   9.19 MVA)  X/R:     2.97
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0080 + J  0.0237  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   11.059 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  11.059 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  11.059 KA
                CBL-0108        BHEQB             11.059 KA      ANG:   -71.33
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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 6HNA          3P Duty:  9.695 KA AT  -69.58 DEG (   8.06 MVA)  X/R:     2.69
               VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0100 + J  0.0268  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    9.695 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   9.695 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   9.695 KA
               CBL-0207        BHNA              9.695 KA      ANG:   -69.58

 6HNB          3P Duty: 11.369 KA AT  -71.80 DEG (   9.45 MVA)  X/R:     3.06
               VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0076 + J  0.0232  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER   11.369 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA  11.369 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA  11.369 KA
               CBL-0196        BHNB             11.369 KA      ANG:   -71.80

 6LCCA         3P Duty:  5.316 KA AT  -67.21 DEG (   1.92 MVA)  X/R:     2.38
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0087 + J  0.0208  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    5.316 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   5.793 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   5.316 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   5.316 KA
               CBL-0227        5LCCA             5.316 KA      ANG:   -67.21

 6LCCB         3P Duty:  3.833 KA AT  -68.98 DEG (   1.38 MVA)  X/R:     2.60
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0112 + J  0.0292  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    3.833 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   4.282 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   3.833 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   3.833 KA
               CBL-0250        5LCCB             3.833 KA      ANG:   -68.98

 6LEQA         3P Duty:  6.045 KA AT  -66.84 DEG (   2.18 MVA)  X/R:     2.34
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0078 + J  0.0183  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    6.045 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   6.554 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   6.045 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   6.045 KA
               CBL-0089        5LEQA             6.045 KA      ANG:   -66.84

 6LEQB         3P Duty:  2.295 KA AT  -54.73 DEG (   0.83 MVA)  X/R:     1.41
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0302 + J  0.0427  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    2.295 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.295 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.295 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.295 KA
                CBL-0107        T-6LEQB SEC        2.295 KA      ANG:   -54.73

 6LLSA          3P Duty:  3.551 KA AT  -56.06 DEG (   1.28 MVA)  X/R:     1.49
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0189 + J  0.0281  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.551 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.551 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.551 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.551 KA
                CBL-0132        5LLSA              3.551 KA      ANG:   -56.06

 6LLSB          3P Duty:  1.909 KA AT  -63.57 DEG (   0.69 MVA)  X/R:     2.01
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0280 + J  0.0563  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.909 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.986 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.909 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.909 KA
                CBL-0154        5LLSB              1.909 KA      ANG:   -63.57

 6LNA           3P Duty:  5.944 KA AT  -65.86 DEG (   2.14 MVA)  X/R:     2.23
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0083 + J  0.0184  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.944 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.362 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.944 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.944 KA
                CBL-0174        5LNA               5.944 KA      ANG:   -65.86

 6LNB           3P Duty:  2.303 KA AT  -69.91 DEG (   0.83 MVA)  X/R:     2.73
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0179 + J  0.0490  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.303 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.608 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.303 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.303 KA
                CBL-0195        T-6LNB SEC         2.303 KA      ANG:   -69.91

 7-1LNA         3P Duty: 12.189 KA AT  -74.39 DEG (   4.39 MVA)  X/R:     3.58
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0027 + J  0.0095  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   12.189 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  12.577 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  12.189 KA
                CBL-0303        BUS-0345          12.189 KA      ANG:   -74.39
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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 7-1LNB          3P Duty:  8.185 KA AT  -68.84 DEG (   2.95 MVA)  X/R:     2.58
                 VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0053 + J  0.0137  OHMS
                 LOW VOLTAGE POWER CIRCUIT BREAKER    8.185 KA
                 MOLDED CASE CIRCUIT BREAKER < 10KA   9.124 KA
                 MOLDED CASE CIRCUIT BREAKER < 20KA   8.185 KA
                 MOLDED CASE CIRCUIT BREAKER > 20KA   8.185 KA
                 CBL-0304        7-1LNA             8.185 KA      ANG:   -68.84

 7-1NLC          3P Duty:  5.972 KA AT  -65.82 DEG (   2.15 MVA)  X/R:     2.23
                 VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0082 + J  0.0183  OHMS
                 LOW VOLTAGE POWER CIRCUIT BREAKER    5.972 KA
                 MOLDED CASE CIRCUIT BREAKER < 10KA   6.388 KA
                 MOLDED CASE CIRCUIT BREAKER < 20KA   5.972 KA
                 MOLDED CASE CIRCUIT BREAKER > 20KA   5.972 KA
                 CBL-0305        7-1LNB             5.972 KA      ANG:   -65.82

 ATS 7 Load Sid 3P Duty:  4.468 KA AT  -81.05 DEG (  32.19 MVA)  X/R:     6.41
                 VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0836 + J  0.5310  OHMS
                 ATS 7           BUS-0342           4.468 KA      ANG:   -81.05

 BHCCA           3P Duty: 14.145 KA AT  -74.97 DEG (  11.76 MVA)  X/R:     3.76
                 VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0051 + J  0.0189  OHMS
                 LOW VOLTAGE POWER CIRCUIT BREAKER   14.145 KA
                 MOLDED CASE CIRCUIT BREAKER < 20KA  14.777 KA
                 MOLDED CASE CIRCUIT BREAKER > 20KA  14.145 KA
                 CBL-0036        CCSWBD            14.145 KA      ANG:   -74.97

 BHCCB           3P Duty: 14.961 KA AT  -76.35 DEG (  12.44 MVA)  X/R:     4.16
                 VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0044 + J  0.0180  OHMS
                 LOW VOLTAGE POWER CIRCUIT BREAKER   14.961 KA
                 MOLDED CASE CIRCUIT BREAKER < 20KA  16.027 KA
                 MOLDED CASE CIRCUIT BREAKER > 20KA  14.961 KA
                 CBL-0045        CCSWBD            14.961 KA      ANG:   -76.35

 BHEQA           3P Duty: 14.376 KA AT  -75.31 DEG (  11.95 MVA)  X/R:     3.84
                 VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0049 + J  0.0186  OHMS
                 LOW VOLTAGE POWER CIRCUIT BREAKER   14.376 KA
                 MOLDED CASE CIRCUIT BREAKER < 20KA  15.098 KA
                 MOLDED CASE CIRCUIT BREAKER > 20KA  14.376 KA
                 CBL-0090        PHEQA              0.871 KA      ANG:   102.42
                 CBL-0059        EQSWBD            13.506 KA      ANG:   -75.17

 BHEQB           3P Duty: 14.823 KA AT  -76.09 DEG (  12.32 MVA)  X/R:     4.08
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0045 + J  0.0181  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   14.823 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  15.799 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  14.823 KA
                CBL-0094        EQSWBD            14.823 KA      ANG:   -76.09

 BHLSA          3P Duty:  8.551 KA AT  -68.70 DEG (   7.11 MVA)  X/R:     2.58
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0118 + J  0.0302  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.551 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   9.523 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   8.551 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.551 KA
                CBL-0116        LSSWBD             8.551 KA      ANG:   -68.70

 BHLSB          3P Duty:  9.588 KA AT  -70.05 DEG (   7.97 MVA)  X/R:     2.77
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0099 + J  0.0272  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.588 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   9.588 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.588 KA
                CBL-0136        LSSWBD             9.588 KA      ANG:   -70.05

 BHNA           3P Duty: 15.010 KA AT  -76.26 DEG (  12.48 MVA)  X/R:     4.12
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0044 + J  0.0179  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   15.010 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  16.037 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  15.010 KA
                CBL-0155        T-BLNA PRI          0.595 KA      ANG:   103.09
                CBL-0034        LVA-B             14.415 KA      ANG:   -76.24

 BHNB           3P Duty: 15.368 KA AT  -76.91 DEG (  12.78 MVA)  X/R:     4.35
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0041 + J  0.0176  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   15.368 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  16.638 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  15.368 KA
                CBL-0035        LVA-B             15.368 KA      ANG:   -76.91

 BLCCA          3P Duty:  9.906 KA AT  -75.59 DEG (   3.57 MVA)  X/R:     3.90
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0030 + J  0.0117  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.906 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  10.447 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.906 KA
                CBL-0038        T-BLCCA SEC         9.906 KA      ANG:   -75.59

 BLCCB          3P Duty: 10.028 KA AT  -75.89 DEG (   3.61 MVA)  X/R:     3.99
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0029 + J  0.0116  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   10.028 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  10.633 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  10.028 KA
                CBL-0047        T-BLCCB SEC       10.028 KA      ANG:   -75.89

 BLCCC          3P Duty:  2.471 KA AT  -34.32 DEG (   0.89 MVA)  X/R:     0.68
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0401 + J  0.0274  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.471 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.471 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.471 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.471 KA
                CBL-0043        BLCCA             2.471 KA      ANG:   -34.32

 BLCCD          3P Duty:  6.524 KA AT  -54.47 DEG (   2.35 MVA)  X/R:     1.40
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0107 + J  0.0150  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.524 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.524 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.524 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.524 KA
                CBL-0039        BLCCA             6.524 KA      ANG:   -54.47

 BLCCE          3P Duty:  4.241 KA AT  -42.62 DEG (   1.53 MVA)  X/R:     0.92
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0208 + J  0.0192  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.241 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.241 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.241 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.241 KA
                CBL-0050        BLCCB             4.241 KA      ANG:   -42.62

 BLEQA          3P Duty: 12.417 KA AT  -76.68 DEG (   4.47 MVA)  X/R:     4.24
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0022 + J  0.0094  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   12.417 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  13.358 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  12.417 KA
                CBL-0061        T-BLEQA SEC       12.417 KA      ANG:   -76.68

 BLEQB          3P Duty:  4.178 KA AT  -72.22 DEG (   1.51 MVA)  X/R:     3.12
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0088 + J  0.0274  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.178 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.905 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.178 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.178 KA
                CBL-0096        T-BLEQB SEC       4.178 KA      ANG:   -72.22
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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BLEQC          3P Duty:  2.971 KA AT  -53.00 DEG (   1.07 MVA)  X/R:     1.33
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0243 + J  0.0323  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    2.971 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   2.971 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   2.971 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   2.971 KA
               CBL-0118        BLLSA             2.971 KA      ANG:   -53.00

BLEQD          3P Duty:  2.860 KA AT  -52.42 DEG (   1.03 MVA)  X/R:     1.30
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0256 + J  0.0333  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    2.860 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   2.860 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   2.860 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   2.860 KA
               CBL-0119        BLEQC             2.860 KA      ANG:   -52.42

BLEQE          3P Duty:  7.002 KA AT  -68.29 DEG (   2.52 MVA)  X/R:     2.51
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0063 + J  0.0159  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    7.002 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   7.746 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   7.002 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   7.002 KA
               CBL-0066        BLEQA             7.002 KA      ANG:   -68.29

BLEQF          3P Duty:  6.468 KA AT  -65.76 DEG (   2.33 MVA)  X/R:     2.22
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0076 + J  0.0169  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    6.468 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   6.914 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   6.468 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   6.468 KA
               CBL-0067        BLEQE             6.468 KA      ANG:   -65.76

BLEQG          3P Duty:  5.941 KA AT  -55.30 DEG (   2.14 MVA)  X/R:     1.44
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0115 + J  0.0166  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    5.941 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   5.941 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   5.941 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   5.941 KA
               CBL-0065        BLEQA             5.941 KA      ANG:   -55.30

BLEQH          3P Duty:  7.864 KA AT  -61.24 DEG (   2.83 MVA)  X/R:     1.82
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0073 + J  0.0134  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    7.864 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.969 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.864 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.864 KA
                CBL-0068        BLEQA             7.864 KA      ANG:   -61.24

 BLEQI          3P Duty:  7.161 KA AT  -59.04 DEG (   2.58 MVA)  X/R:     1.67
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0086 + J  0.0144  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.161 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.161 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.161 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.161 KA
                CBL-0069        BLEQH             7.161 KA      ANG:   -59.04

 BLEQJ          3P Duty:  2.658 KA AT  -51.73 DEG (   0.96 MVA)  X/R:     1.27
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0280 + J  0.0355  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.658 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.658 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.658 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.658 KA
                CBL-0110        BLEQB             2.658 KA      ANG:   -51.73

 BLLSA          3P Duty:  6.397 KA AT  -72.12 DEG (   2.30 MVA)  X/R:     3.10
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0058 + J  0.0179  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.397 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.500 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.397 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.397 KA
                CBL-0113        T-BLLSA SEC       6.397 KA      ANG:   -72.12

 BLLSB          3P Duty:  3.624 KA AT  -66.48 DEG (   1.31 MVA)  X/R:     2.30
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0132 + J  0.0304  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.624 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.910 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.624 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.624 KA
                CBL-0138        1LLSB             3.624 KA      ANG:   -66.48

 BLLSC          3P Duty:  1.872 KA AT  -33.04 DEG (   0.67 MVA)  X/R:     0.65
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0538 + J  0.0350  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.872 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.872 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.872 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.872 KA
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

CONTRIBUTIONS TO BLLSC (CONTINUED)
CBL-0120 BLLSA 1.872 KA ANG: -33.04

BLLSD 3P Duty: 4.699 KA AT -55.26 DEG (1.69 MVA) X/R: 1.44
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0146 + J 0.0210 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 4.699 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 4.699 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 4.699 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 4.699 KA
CBL-0115 BLLSA 4.699 KA ANG: -55.26

BLLSE 3P Duty: 3.610 KA AT -55.41 DEG (1.30 MVA) X/R: 1.45
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0189 + J 0.0274 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 3.610 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 3.610 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 3.610 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 3.610 KA
CBL-0117 BLLSF 3.610 KA ANG: -55.41

BLLSF 3P Duty: 3.765 KA AT -57.19 DEG (1.36 MVA) X/R: 1.55
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0173 + J 0.0268 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 3.765 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 3.765 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 3.765 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 3.765 KA
CBL-0114 BLLSA 3.765 KA ANG: -57.19

BLLSG 3P Duty: 2.294 KA AT -47.12 DEG (0.83 MVA) X/R: 1.08
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0356 + J 0.0384 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 2.294 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 2.294 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 2.294 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 2.294 KA
CBL-0139 BLLSB 2.294 KA ANG: -47.12

BLNA 3P Duty: 13.903 KA AT -77.01 DEG (5.01 MVA) X/R: 4.35
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0019 + J 0.0084 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 13.903 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 15.049 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 13.903 KA
CBL-0161 BUS-0180 1.476 KA ANG: -256.87
CBL-0156 T-BLNA SEC 12.428 KA ANG: -77.03

BLNC 3P Duty: 3.767 KA AT -47.69 DEG (1.36 MVA) X/R: 1.10

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0215 + J  0.0236  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.767 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.767 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.767 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.767 KA
                CBL-0160        BLNA               3.767 KA      ANG:   -47.69

 BLND           3P Duty:  9.396 KA AT  -63.11 DEG (   3.39 MVA)  X/R:     1.97
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0058 + J  0.0114  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.396 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   9.723 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   9.396 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.396 KA
                CBL-0158        BLNA               9.396 KA      ANG:   -63.11

 BLNE           3P Duty:  5.277 KA AT  -51.71 DEG (   1.90 MVA)  X/R:     1.27
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0141 + J  0.0179  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.277 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   5.277 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.277 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.277 KA
                CBL-0159        BLNA               5.277 KA      ANG:   -51.71

 BLNF           3P Duty:  3.450 KA AT  -44.30 DEG (   1.24 MVA)  X/R:     0.98
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0249 + J  0.0243  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.450 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.450 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.450 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.450 KA
                CBL-0180        1LNB               3.450 KA      ANG:   -44.30

 BUS UTIL       3P Duty:  5.765 KA AT  -78.76 DEG ( 124.52 MVA)  X/R:     5.03
                VOLTAGE:  12470.   EQUIV. IMPEDANCE=  0.2435 + J  1.2249  OHMS
                CBL-0300        BUS-0338           5.713 KA      ANG:   101.23
                XFMR UTIL 2     BUS-0004           0.052 KA      ANG:  -257.42

 CCSWBD         3P Duty: 17.992 KA AT  -81.62 DEG (  14.96 MVA)  X/R:     6.94
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0022 + J  0.0152  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   18.157 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  19.278 KA
                CBL-0020        ATS CC            17.992 KA      ANG:   -81.62

 DIST PNL R     3P Duty:  7.527 KA AT  -71.27 DEG (   2.71 MVA)  X/R:     2.95
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0051 + J  0.0151  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    7.527 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.706 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.527 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.527 KA
                CBL-0049        BLCCB              7.527 KA      ANG:   -71.27

 EMER RM 360    3P Duty:  2.609 KA AT  -51.46 DEG (   0.94 MVA)  X/R:     1.26
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0287 + J  0.0360  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.609 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.609 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.609 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.609 KA
                CBL-0245        3LCCB              2.609 KA      ANG:   -51.46

 EQSWBD         3P Duty: 18.037 KA AT  -81.67 DEG (  15.00 MVA)  X/R:     6.96
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0022 + J  0.0152  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   18.216 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  19.341 KA
                CBL-0025        ATS EQ            17.181 KA      ANG:   -81.89
                CBL-0059        BHEQA              0.859 KA      ANG:  -257.21

 EQUIP RM 372   3P Duty:  1.607 KA AT  -52.07 DEG (   0.58 MVA)  X/R:     1.28
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0459 + J  0.0589  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.607 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.607 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.607 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.607 KA
                CBL-0105        3LEQB              1.607 KA      ANG:   -52.07

 LSS 1          3P Duty:  4.319 KA AT  -82.35 DEG (  31.12 MVA)  X/R:     7.44
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0741 + J  0.5511  OHMS
                CBL-0006        SWGR 1             4.319 KA      ANG:   -82.35

 LSS 2          3P Duty:  4.469 KA AT  -82.16 DEG (  32.20 MVA)  X/R:     7.33
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0733 + J  0.5324  OHMS
                CBL-0013        SWGR 2             4.310 KA      ANG:   -82.34
                CBL-0015        MVS 2              0.160 KA      ANG:  -257.26

 LSSWBD         3P Duty: 17.629 KA AT  -80.81 DEG (  14.66 MVA)  X/R:     6.30
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0025 + J  0.0155  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   17.629 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  18.564 KA
                CBL-0028        ATS LS            17.629 KA      ANG:   -80.81
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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LVA-A          3P Duty: 18.474 KA AT  -82.30 DEG (  15.36 MVA)  X/R:     7.58
               VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0020 + J  0.0149  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER   18.927 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA  20.096 KA
               CBL-0024        BUS-0023           0.858 KA      ANG:  -257.18
               CBL-0012        LVA-B             17.620 KA      ANG:    97.45

LVA-B          3P Duty: 18.477 KA AT  -82.31 DEG (  15.36 MVA)  X/R:     7.60
               VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0020 + J  0.0149  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER   18.937 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA  20.107 KA
               T 1500 B        MVS 2             17.036 KA      ANG:    97.24
               CBL-0012        LVA-A              0.858 KA      ANG:   -77.18
               CBL-0034        BHNA               0.590 KA      ANG:  -256.70

MP5C-1         3P Duty:  4.454 KA AT  -64.44 DEG (   1.60 MVA)  X/R:     2.09
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0116 + J  0.0243  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    4.454 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   4.682 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   4.454 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   4.454 KA
               CBL-0062        BLEQA              4.454 KA      ANG:   -64.44

MP5C-2         3P Duty:  4.400 KA AT  -64.35 DEG (   1.59 MVA)  X/R:     2.08
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0118 + J  0.0246  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    4.400 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   4.621 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   4.400 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   4.400 KA
               CBL-0063        MP5C-1             4.400 KA      ANG:   -64.35

MVS 1          3P Duty:  4.468 KA AT  -82.16 DEG (  32.20 MVA)  X/R:     7.32
               VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0733 + J  0.5325  OHMS
               CBL-0009        LSS 2              4.468 KA      ANG:    97.84

MVS 2          3P Duty:  4.468 KA AT  -82.16 DEG (  32.20 MVA)  X/R:     7.33
               VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0733 + J  0.5325  OHMS
               CBL-0015        LSS 2              4.309 KA      ANG:   -82.34
               T 1500 B        LVA-B              0.160 KA      ANG:   -77.26

PHEQA          3P Duty: 11.517 KA AT  -70.76 DEG (   9.58 MVA)  X/R:     2.92
               VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0079 + J  0.0227  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER   11.517 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  11.517 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  11.517 KA
                CBL-0091        T-PLEQA PRI        0.885 KA      ANG:   101.97
                CBL-0090        BHEQA             10.640 KA      ANG:   -70.15

 PLEQA          3P Duty:  8.705 KA AT  -75.56 DEG (   3.14 MVA)  X/R:     4.02
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0034 + J  0.0134  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.705 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   9.247 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.705 KA
                CBL-0294        BUS-0339           1.176 KA      ANG:    99.72
                CBL-0296        BUS-0340           0.793 KA      ANG:   101.86
                CBL-0298        BUS-0341           0.793 KA      ANG:   101.86
                CBL-0092        T-PLEQA SEC        5.952 KA      ANG:   -73.94

 PLNA           3P Duty:  4.780 KA AT  -50.38 DEG (   1.72 MVA)  X/R:     1.21
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0160 + J  0.0194  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.780 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.780 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.780 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.780 KA
                CBL-0175        BLNA               4.780 KA      ANG:   -50.38

 PNL A          3P Duty:  2.480 KA AT  -36.64 DEG (   0.89 MVA)  X/R:     0.74
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0389 + J  0.0289  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.480 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.480 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.480 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.480 KA
                CBL-0239        2LCCB              2.480 KA      ANG:   -36.64

 PNL B          3P Duty:  6.376 KA AT  -58.50 DEG (   2.30 MVA)  X/R:     1.65
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0098 + J  0.0161  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.376 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.376 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.376 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.376 KA
                CBL-0093        PLEQA              6.376 KA      ANG:   -58.50

 PNL BIO MED    3P Duty:  1.743 KA AT  -38.96 DEG (   0.63 MVA)  X/R:     0.81
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0536 + J  0.0433  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    1.743 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.743 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.743 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.743 KA
                CBL-0111        BLEQB              1.743 KA      ANG:   -38.96

 PNL L          3P Duty:  2.623 KA AT  -36.76 DEG (   0.95 MVA)  X/R:     0.75
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0367 + J  0.0274  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.623 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.623 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.623 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.623 KA
                CBL-0235        1LCCB              2.623 KA      ANG:   -36.76

 PNL R          3P Duty:  2.623 KA AT  -36.76 DEG (   0.95 MVA)  X/R:     0.75
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0367 + J  0.0274  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.623 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.623 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.623 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.623 KA
                CBL-0234        1LCCB              2.623 KA      ANG:   -36.76

 PNL UTIL SHOP  3P Duty:  5.830 KA AT  -54.96 DEG (   2.10 MVA)  X/R:     1.43
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0118 + J  0.0169  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.830 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   5.830 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.830 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.830 KA
                CBL-0072        BLEQA              5.830 KA      ANG:   -54.96

 PNL UTIL SHOP  3P Duty:  3.705 KA AT  -48.62 DEG (   1.33 MVA)  X/R:     1.14
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0214 + J  0.0243  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.705 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.705 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.705 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.705 KA
                CBL-0073        PNL UTIL SHOP      3.705 KA      ANG:   -48.62

 PNL UTIL SHOP  3P Duty:  3.450 KA AT  -47.87 DEG (   1.24 MVA)  X/R:     1.11
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0233 + J  0.0258  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.450 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.450 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.450 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.450 KA
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

CONTRIBUTIONS TO PNL UTIL SHOP (CONTINUED)

	CBL-0074	PNL UTIL SHOP	3.450 KA	ANG: -47.87
RP5L	3P Duty: 2.517 KA AT -39.21 DEG (0.91 MVA) X/R: 0.82			
	VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0370 + J 0.0302 OHMS			
	LOW VOLTAGE POWER CIRCUIT BREAKER		2.517 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA		2.517 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA		2.517 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA		2.517 KA	
	CBL-0229	5LCCA	2.517 KA	ANG: -39.21
RP6L	3P Duty: 2.311 KA AT -38.34 DEG (0.83 MVA) X/R: 0.79			
	VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0407 + J 0.0322 OHMS			
	LOW VOLTAGE POWER CIRCUIT BREAKER		2.311 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA		2.311 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA		2.311 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA		2.311 KA	
	CBL-0228	6LCCA	2.311 KA	ANG: -38.34
RP6R	3P Duty: 2.625 KA AT -52.45 DEG (0.95 MVA) X/R: 1.30			
	VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0279 + J 0.0363 OHMS			
	LOW VOLTAGE POWER CIRCUIT BREAKER		2.625 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA		2.625 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA		2.625 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA		2.625 KA	
	CBL-0251	6LCCB	2.625 KA	ANG: -52.45
SWGR 1	3P Duty: 4.403 KA AT -82.81 DEG (31.72 MVA) X/R: 7.93			
	VOLTAGE: 4160. EQUIV. IMPEDANCE= 0.0683 + J 0.5412 OHMS			
	CBL-0001	BUS-0002	4.403 KA	ANG: -82.81
SWGR 2	3P Duty: 4.551 KA AT -82.61 DEG (32.79 MVA) X/R: 7.80			
	VOLTAGE: 4160. EQUIV. IMPEDANCE= 0.0679 + J 0.5233 OHMS			
	CBL-0013	LSS 2	0.160 KA	ANG: -257.24
	CBL-0002	BUS-0004	4.392 KA	ANG: -82.81
SWGR PARALLEL	3P Duty: 16.070 KA AT -86.93 DEG (13.36 MVA) X/R: 18.75			
	VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0009 + J 0.0172 OHMS			
	LOW VOLTAGE POWER CIRCUIT BREAKER		18.299 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA		19.428 KA	
	CBL-0022	BUS GEN LV 1	7.965 KA	ANG: 93.04
	CBL-0023	BUS GEN LV 2	7.965 KA	ANG: 93.04
	CBL-0030	T 750 CAST PRI	0.141 KA	ANG: -264.10

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

VA Clarksburg
Utility Contribution

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
1 HNB	3P Duty:	14.527	4.	Z1= 8.2801	17.283	15.936
	SLG DUTY:	14.369	3.	Z2= 8.2801	15.956	
480. VOLTS	LN/LN:	12.580		Z0= 8.7215		
	LN/LN/GND:	15.403 (14.119 GND RETURN KA)				
19-1LEQA	3P Duty:	2.610	2.	Z1= 106.3532	2.789	2.700
	SLG DUTY:	2.692	2.	Z2= 106.3532	2.897	
208. VOLTS	LN/LN:	2.260		Z0= 96.6679		
	LN/LN/GND:	2.617 (2.779 GND RETURN KA)				
19-1LNA	3P Duty:	2.656	3.	Z1= 104.5041	2.893	2.776
	SLG DUTY:	2.724	3.	Z2= 104.5041	2.972	
208. VOLTS	LN/LN:	2.300		Z0= 96.6679		
	LN/LN/GND:	2.684 (2.796 GND RETURN KA)				
1CA	3P Duty:	1.991	1.	Z1= 139.4112	1.991	1.991
	SLG DUTY:	1.238	0.	Z2= 139.4112	1.238	
208. VOLTS	LN/LN:	1.724		Z0= 396.1372		
	LN/LN/GND:	1.841 (0.895 GND RETURN KA)				
1CB	3P Duty:	4.034	1.	Z1= 68.8028	4.058	4.046
	SLG DUTY:	2.823	1.	Z2= 68.8028	2.827	
208. VOLTS	LN/LN:	3.494		Z0= 159.3578		
	LN/LN/GND:	3.846 (2.157 GND RETURN KA)				
1CC	3P Duty:	2.311	1.	Z1= 120.0846	2.312	2.311
	SLG DUTY:	1.451	0.	Z2= 120.0846	1.451	
208. VOLTS	LN/LN:	2.002		Z0= 335.8205		
	LN/LN/GND:	2.146 (1.054 GND RETURN KA)				
1CD	3P Duty:	3.831	1.	Z1= 72.4595	3.850	3.841
	SLG DUTY:	2.659	1.	Z2= 72.4595	2.663	
208. VOLTS	LN/LN:	3.318		Z0= 170.2038		
	LN/LN/GND:	3.643 (2.024 GND RETURN KA)				
1HCCB	3P Duty:	14.160	4.	Z1= 8.4946	16.705	15.460
	SLG DUTY:	13.792	3.	Z2= 8.4946	15.179	
480. VOLTS	LN/LN:	12.263		Z0= 9.3627		
	LN/LN/GND:	14.933 (13.346 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
1HLSB	3P Duty:	9.150	3.	Z1= 13.1448	9.891	9.524
	SLG DUTY:	7.500	2.	Z2= 13.1448	7.761	
480. VOLTS	LN/LN:	7.925		Z0= 22.1895		
	LN/LN/GND:	9.066 (6.307 GND RETURN KA)				
1LCCA	3P Duty:	7.481	3.	Z1= 37.1027	8.183	7.836
	SLG DUTY:	7.026	2.	Z2= 37.1027	7.408	
208. VOLTS	LN/LN:	6.479		Z0= 44.8869		
	LN/LN/GND:	7.678 (6.591 GND RETURN KA)				
1LCCB	3P Duty:	7.206	3.	Z1= 38.5198	8.280	7.752
	SLG DUTY:	7.642	3.	Z2= 38.5198	8.682	
208. VOLTS	LN/LN:	6.241		Z0= 31.9543		
	LN/LN/GND:	7.548 (8.132 GND RETURN KA)				
1LCCC	3P Duty:	2.782	1.	Z1= 99.7680	2.783	2.783
	SLG DUTY:	1.857	1.	Z2= 99.7680	1.857	
208. VOLTS	LN/LN:	2.409		Z0= 252.0880		
	LN/LN/GND:	2.637 (1.384 GND RETURN KA)				
1LCCD	3P Duty:	4.038	2.	Z1= 68.7363	4.106	4.072
	SLG DUTY:	3.212	1.	Z2= 68.7363	3.226	
208. VOLTS	LN/LN:	3.497		Z0= 124.4160		
	LN/LN/GND:	4.002 (2.640 GND RETURN KA)				
1LCCE	3P Duty:	3.937	2.	Z1= 70.5080	3.998	3.967
	SLG DUTY:	3.106	1.	Z2= 70.5080	3.118	
208. VOLTS	LN/LN:	3.409		Z0= 129.7984		
	LN/LN/GND:	3.892 (2.540 GND RETURN KA)				
1LEQA	3P Duty:	7.349	3.	Z1= 37.7678	7.969	7.663
	SLG DUTY:	6.376	2.	Z2= 37.7678	6.667	
208. VOLTS	LN/LN:	6.365		Z0= 55.7049		
	LN/LN/GND:	7.323 (5.603 GND RETURN KA)				
1LEQB	3P Duty:	2.244	2.	Z1= 123.6681	2.412	2.329
	SLG DUTY:	2.230	2.	Z2= 123.6681	2.356	
208. VOLTS	LN/LN:	1.944		Z0= 126.5981		
	LN/LN/GND:	2.311 (2.213 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
1LLSA	3P Duty:	4.107	2.	Z1= 67.5838	4.201	4.154
	SLG DUTY:	3.523	1.	Z2= 67.5838	3.548	
208. VOLTS	LN/LN:	3.557		Z0= 103.6765		
	LN/LN/GND:	4.165 (3.053 GND RETURN KA)				
1LLSB	3P Duty:	3.884	3.	Z1= 71.4651	4.312	4.101
	SLG DUTY:	4.100	3.	Z2= 71.4651	4.546	
208. VOLTS	LN/LN:	3.364		Z0= 60.1885		
	LN/LN/GND:	4.010 (4.341 GND RETURN KA)				
1LLSC	3P Duty:	2.261	1.	Z1= 122.7655	2.262	2.262
	SLG DUTY:	1.569	1.	Z2= 122.7655	1.569	
208. VOLTS	LN/LN:	1.958		Z0= 289.8839		
	LN/LN/GND:	2.167 (1.191 GND RETURN KA)				
1LLSD	3P Duty:	2.168	1.	Z1= 128.0340	2.172	2.170
	SLG DUTY:	1.646	1.	Z2= 128.0340	1.646	
208. VOLTS	LN/LN:	1.878		Z0= 256.9106		
	LN/LN/GND:	2.143 (1.309 GND RETURN KA)				
1LNA	3P Duty:	9.232	3.	Z1= 30.0653	9.977	9.608
	SLG DUTY:	8.190	2.	Z2= 30.0653	8.524	
208. VOLTS	LN/LN:	7.995		Z0= 42.1740		
	LN/LN/GND:	9.326 (7.314 GND RETURN KA)				
1LNB	3P Duty:	7.375	4.	Z1= 37.6373	8.536	7.966
	SLG DUTY:	7.896	3.	Z2= 37.6373	9.076	
208. VOLTS	LN/LN:	6.387		Z0= 30.1970		
	LN/LN/GND:	7.731 (8.495 GND RETURN KA)				
1LNC	3P Duty:	3.210	1.	Z1= 86.4604	3.214	3.212
	SLG DUTY:	2.284	1.	Z2= 86.4604	2.284	
208. VOLTS	LN/LN:	2.780		Z0= 195.8404		
	LN/LN/GND:	3.114 (1.753 GND RETURN KA)				
1WC	3P Duty:	3.736	1.	Z1= 74.2912	3.754	3.745
	SLG DUTY:	2.584	1.	Z2= 74.2912	2.587	
208. VOLTS	LN/LN:	3.236		Z0= 175.6296		
	LN/LN/GND:	3.550 (1.964 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
2HEQA	3P Duty:	10.579	3.	Z1= 11.3695	11.685	11.139
	SLG DUTY:	8.938	2.	Z2= 11.3695	9.349	
480. VOLTS	LN/LN:	9.162		Z0= 17.9691		
	LN/LN/GND:	10.606 (	7.675 GND RETURN KA)			
2HEQB	3P Duty:	12.993	3.	Z1= 9.2573	14.956	13.992
	SLG DUTY:	12.107	2.	Z2= 9.2573	13.046	
480. VOLTS	LN/LN:	11.252		Z0= 11.5269		
	LN/LN/GND:	13.470 (	11.244 GND RETURN KA)			
2HNA	3P Duty:	10.485	3.	Z1= 11.4715	11.578	11.039
	SLG DUTY:	8.912	2.	Z2= 11.4715	9.332	
480. VOLTS	LN/LN:	9.081		Z0= 17.8673		
	LN/LN/GND:	10.515 (	7.689 GND RETURN KA)			
2HNB	3P Duty:	13.768	4.	Z1= 8.7360	16.118	14.967
	SLG DUTY:	13.239	3.	Z2= 8.7360	14.482	
480. VOLTS	LN/LN:	11.924		Z0= 9.9812		
	LN/LN/GND:	14.435 (	12.657 GND RETURN KA)			
2LCCA	3P Duty:	7.215	3.	Z1= 38.4726	7.842	7.532
	SLG DUTY:	6.661	2.	Z2= 38.4726	6.983	
208. VOLTS	LN/LN:	6.248		Z0= 48.7220		
	LN/LN/GND:	7.367 (	6.154 GND RETURN KA)			
2LCCB	3P Duty:	6.774	3.	Z1= 40.9747	7.678	7.234
	SLG DUTY:	6.924	3.	Z2= 40.9747	7.687	
208. VOLTS	LN/LN:	5.867		Z0= 38.4314		
	LN/LN/GND:	7.027 (	7.073 GND RETURN KA)			
2LCCC	3P Duty:	3.796	1.	Z1= 73.1282	3.833	3.814
	SLG DUTY:	2.792	1.	Z2= 73.1282	2.799	
208. VOLTS	LN/LN:	3.287		Z0= 154.3918		
	LN/LN/GND:	3.671 (	2.191 GND RETURN KA)			
2LCCD	3P Duty:	3.657	1.	Z1= 75.9045	3.686	3.671
	SLG DUTY:	2.661	1.	Z2= 75.9045	2.666	
208. VOLTS	LN/LN:	3.167		Z0= 163.5997		
	LN/LN/GND:	3.528 (	2.076 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
2LCCE	3P Duty:	3.431	1.	Z1= 80.8914	3.439	3.435
	SLG DUTY:	2.505	1.	Z2= 80.8914	2.505	
208. VOLTS	LN/LN:	2.972		Z0= 174.7605		
	LN/LN/GND:	3.351 (	1.949	GND RETURN KA)		
2LCCF	3P Duty:	3.431	1.	Z1= 80.8914	3.439	3.435
	SLG DUTY:	2.505	1.	Z2= 80.8914	2.505	
208. VOLTS	LN/LN:	2.972		Z0= 174.7605		
	LN/LN/GND:	3.351 (	1.949	GND RETURN KA)		
2LEQA	3P Duty:	6.893	2.	Z1= 40.2705	7.427	7.162
	SLG DUTY:	5.851	2.	Z2= 40.2705	6.090	
208. VOLTS	LN/LN:	5.969		Z0= 62.4819		
	LN/LN/GND:	6.822 (	5.058	GND RETURN KA)		
2LEQB	3P Duty:	2.328	3.	Z1= 119.2119	2.555	2.443
	SLG DUTY:	2.370	3.	Z2= 119.2119	2.583	
208. VOLTS	LN/LN:	2.016		Z0= 113.0057		
	LN/LN/GND:	2.375 (	2.412	GND RETURN KA)		
2LLSA	3P Duty:	3.905	2.	Z1= 71.0889	3.980	3.943
	SLG DUTY:	3.280	1.	Z2= 71.0889	3.298	
208. VOLTS	LN/LN:	3.381		Z0= 114.3985		
	LN/LN/GND:	3.934 (	2.798	GND RETURN KA)		
2LLSB	3P Duty:	3.624	2.	Z1= 76.6028	3.852	3.739
	SLG DUTY:	3.637	2.	Z2= 76.6028	3.781	
208. VOLTS	LN/LN:	3.138		Z0= 76.6235		
	LN/LN/GND:	3.819 (	3.637	GND RETURN KA)		
2LLSC	3P Duty:	1.964	1.	Z1= 141.3334	1.965	1.964
	SLG DUTY:	1.329	1.	Z2= 141.3334	1.329	
208. VOLTS	LN/LN:	1.701		Z0= 348.5384		
	LN/LN/GND:	1.867 (	0.997	GND RETURN KA)		
2LLSD	3P Duty:	2.386	1.	Z1= 116.3246	2.398	2.392
	SLG DUTY:	1.894	1.	Z2= 116.3246	1.895	
208. VOLTS	LN/LN:	2.066		Z0= 213.2296		
	LN/LN/GND:	2.387 (	1.548	GND RETURN KA)		

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
2LNA	3P Duty:	8.827	2.	Z1= 31.4442	9.479	9.156
	SLG DUTY:	7.693	2.	Z2= 31.4442	7.970	
208. VOLTS	LN/LN:	7.645		Z0= 46.0407		
	LN/LN/GND:	8.870 (6.774 GND RETURN KA)				
2LNB	3P Duty:	2.339	3.	Z1= 118.6795	2.568	2.455
	SLG DUTY:	2.377	3.	Z2= 118.6795	2.592	
208. VOLTS	LN/LN:	2.025		Z0= 113.0057		
	LN/LN/GND:	2.384 (2.416 GND RETURN KA)				
3A EM	3P Duty:	2.501	1.	Z1= 110.9639	2.502	2.502
	SLG DUTY:	1.652	1.	Z2= 110.9639	1.652	
208. VOLTS	LN/LN:	2.166		Z0= 285.4247		
	LN/LN/GND:	2.360 (1.226 GND RETURN KA)				
3A1	3P Duty:	3.868	2.	Z1= 71.7625	4.060	3.965
	SLG DUTY:	2.973	2.	Z2= 71.7625	3.047	
208. VOLTS	LN/LN:	3.350		Z0= 137.6968		
	LN/LN/GND:	3.715 (2.405 GND RETURN KA)				
3HCCB	3P Duty:	12.299	3.	Z1= 9.7797	13.323	12.816
	SLG DUTY:	10.993	2.	Z2= 9.7797	11.310	
480. VOLTS	LN/LN:	10.651		Z0= 13.7321		
	LN/LN/GND:	12.786 (9.799 GND RETURN KA)				
3HLSB	3P Duty:	7.644	2.	Z1= 15.7352	7.784	7.714
	SLG DUTY:	5.761	1.	Z2= 15.7352	5.785	
480. VOLTS	LN/LN:	6.620		Z0= 31.8847		
	LN/LN/GND:	7.504 (4.571 GND RETURN KA)				
3HNB	3P Duty:	13.082	4.	Z1= 9.1943	15.109	14.114
	SLG DUTY:	12.269	3.	Z2= 9.1943	13.267	
480. VOLTS	LN/LN:	11.330		Z0= 11.2455		
	LN/LN/GND:	13.582 (11.464 GND RETURN KA)				
3LCCA	3P Duty:	5.960	3.	Z1= 46.5740	6.436	6.200
	SLG DUTY:	5.133	2.	Z2= 46.5740	5.361	
208. VOLTS	LN/LN:	5.161		Z0= 69.7822		
	LN/LN/GND:	5.907 (4.488 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
3LCCB	3P Duty:	4.076	3.	Z1= 68.1054	4.533	4.308
	SLG DUTY:	4.240	3.	Z2= 68.1054	4.707	
208. VOLTS	LN/LN:	3.530		Z0= 60.1885		
	LN/LN/GND:	4.175 (4.418 GND RETURN KA)				
3LCCC	3P Duty:	4.148	2.	Z1= 66.9131	4.236	4.192
	SLG DUTY:	3.159	1.	Z2= 66.9131	3.182	
208. VOLTS	LN/LN:	3.592		Z0= 131.6329		
	LN/LN/GND:	4.028 (2.534 GND RETURN KA)				
3LEQA	3P Duty:	6.893	2.	Z1= 40.2705	7.427	7.162
	SLG DUTY:	5.851	2.	Z2= 40.2705	6.090	
208. VOLTS	LN/LN:	5.969		Z0= 62.4819		
	LN/LN/GND:	6.822 (5.058 GND RETURN KA)				
3LEQB	3P Duty:	2.232	2.	Z1= 124.3745	2.398	2.315
	SLG DUTY:	2.222	2.	Z2= 124.3745	2.346	
208. VOLTS	LN/LN:	1.933		Z0= 126.5981		
	LN/LN/GND:	2.300 (2.209 GND RETURN KA)				
3LLSA	3P Duty:	3.905	2.	Z1= 71.0889	3.980	3.943
	SLG DUTY:	3.280	1.	Z2= 71.0889	3.298	
208. VOLTS	LN/LN:	3.381		Z0= 114.3985		
	LN/LN/GND:	3.934 (2.798 GND RETURN KA)				
3LLSB	3P Duty:	2.014	2.	Z1= 137.8320	2.144	2.080
	SLG DUTY:	2.071	2.	Z2= 137.8320	2.198	
208. VOLTS	LN/LN:	1.744		Z0= 126.4428		
	LN/LN/GND:	2.057 (2.131 GND RETURN KA)				
3LLSC	3P Duty:	1.913	1.	Z1= 145.0685	1.914	1.914
	SLG DUTY:	1.289	1.	Z2= 145.0685	1.289	
208. VOLTS	LN/LN:	1.657		Z0= 360.5157		
	LN/LN/GND:	1.816 (0.965 GND RETURN KA)				
3LLSD	3P Duty:	1.516	1.	Z1= 183.0824	1.530	1.523
	SLG DUTY:	1.303	1.	Z2= 183.0824	1.306	
208. VOLTS	LN/LN:	1.313		Z0= 280.1864		
	LN/LN/GND:	1.542 (1.130 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
3LNA	3P Duty:	6.765	2.	Z1= 41.0292	7.220	6.994
	SLG DUTY:	5.466	2.	Z2= 41.0292	5.655	
208. VOLTS	LN/LN:	5.859		Z0= 70.9634		
	LN/LN/GND:	6.594 (	4.566 GND RETURN KA)			
3LNB	3P Duty:	2.330	3.	Z1= 119.1468	2.557	2.445
	SLG DUTY:	2.371	3.	Z2= 119.1468	2.584	
208. VOLTS	LN/LN:	2.018		Z0= 113.0057		
	LN/LN/GND:	2.376 (	2.413 GND RETURN KA)			
3LNC	3P Duty:	4.503	2.	Z1= 61.6372	4.576	4.540
	SLG DUTY:	3.266	1.	Z2= 61.6372	3.284	
208. VOLTS	LN/LN:	3.900		Z0= 133.2177		
	LN/LN/GND:	4.312 (	2.548 GND RETURN KA)			
4AD	3P Duty:	3.996	2.	Z1= 69.4603	4.081	4.038
	SLG DUTY:	3.023	1.	Z2= 69.4603	3.045	
208. VOLTS	LN/LN:	3.461		Z0= 138.4103		
	LN/LN/GND:	3.870 (	2.415 GND RETURN KA)			
4C	3P Duty:	3.996	2.	Z1= 69.4600	4.081	4.039
	SLG DUTY:	3.023	1.	Z2= 69.4600	3.045	
208. VOLTS	LN/LN:	3.461		Z0= 138.4100		
	LN/LN/GND:	3.870 (	2.415 GND RETURN KA)			
4DP	3P Duty:	3.613	2.	Z1= 76.8225	3.782	3.698
	SLG DUTY:	2.741	2.	Z2= 76.8225	2.805	
208. VOLTS	LN/LN:	3.129		Z0= 151.3048		
	LN/LN/GND:	3.458 (	2.200 GND RETURN KA)			
4EML	3P Duty:	3.360	2.	Z1= 82.6011	3.453	3.407
	SLG DUTY:	2.490	1.	Z2= 82.6011	2.518	
208. VOLTS	LN/LN:	2.910		Z0= 170.8820		
	LN/LN/GND:	3.216 (	1.968 GND RETURN KA)			
4HEQA	3P Duty:	10.162	3.	Z1= 11.8363	11.162	10.668
	SLG DUTY:	8.477	2.	Z2= 11.8363	8.839	
480. VOLTS	LN/LN:	8.801		Z0= 19.2449		
	LN/LN/GND:	10.141 (	7.213 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
4HEQB	3P Duty:	12.090	3.	Z1= 9.9489	13.696	12.906
	SLG DUTY:	10.914	2.	Z2= 9.9489	11.623	
480. VOLTS	LN/LN:	10.470		Z0= 13.4308		
	LN/LN/GND:	12.383 (9.867 GND RETURN KA)				
4HNA	3P Duty:	6.932	2.	Z1= 17.3520	7.354	7.144
	SLG DUTY:	5.296	2.	Z2= 17.3520	5.436	
480. VOLTS	LN/LN:	6.003		Z0= 33.8310		
	LN/LN/GND:	6.708 (4.261 GND RETURN KA)				
4HNB	3P Duty:	12.459	3.	Z1= 9.6545	14.224	13.356
	SLG DUTY:	11.428	2.	Z2= 9.6545	12.247	
480. VOLTS	LN/LN:	10.789		Z0= 12.5129		
	LN/LN/GND:	12.825 (10.473 GND RETURN KA)				
4L	3P Duty:	3.502	2.	Z1= 79.2635	3.635	3.569
	SLG DUTY:	2.631	2.	Z2= 79.2635	2.677	
208. VOLTS	LN/LN:	3.033		Z0= 159.3602		
	LN/LN/GND:	3.352 (2.098 GND RETURN KA)				
4LA	3P Duty:	3.484	2.	Z1= 79.6675	3.609	3.547
	SLG DUTY:	2.611	2.	Z2= 79.6675	2.654	
208. VOLTS	LN/LN:	3.017		Z0= 160.9365		
	LN/LN/GND:	3.335 (2.080 GND RETURN KA)				
4LCCA	3P Duty:	5.656	2.	Z1= 49.0797	6.078	5.869
	SLG DUTY:	4.787	2.	Z2= 49.0797	4.982	
208. VOLTS	LN/LN:	4.898		Z0= 76.5552		
	LN/LN/GND:	5.577 (4.132 GND RETURN KA)				
4LCCB	3P Duty:	3.827	2.	Z1= 72.5311	4.099	3.964
	SLG DUTY:	3.815	2.	Z2= 72.5311	4.000	
208. VOLTS	LN/LN:	3.314		Z0= 73.8058		
	LN/LN/GND:	3.986 (3.793 GND RETURN KA)				
4LEQA	3P Duty:	6.489	2.	Z1= 42.7784	6.954	6.724
	SLG DUTY:	5.404	2.	Z2= 42.7784	5.605	
208. VOLTS	LN/LN:	5.619		Z0= 69.2663		
	LN/LN/GND:	6.386 (4.609 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
4LEQB	3P Duty:	2.315	3.	Z1= 119.9130	2.538	2.428
	SLG DUTY:	2.360	3.	Z2= 119.9130	2.571	
208. VOLTS	LN/LN:	2.005		Z0= 113.0057		
	LN/LN/GND:	2.362 (	2.408 GND RETURN KA)			
4LEQC	3P Duty:	4.046	1.	Z1= 68.6115	4.102	4.074
	SLG DUTY:	2.944	1.	Z2= 68.6115	2.956	
208. VOLTS	LN/LN:	3.504		Z0= 147.5223		
	LN/LN/GND:	3.884 (	2.299 GND RETURN KA)			
4LLSA	3P Duty:	3.720	2.	Z1= 74.6175	3.782	3.751
	SLG DUTY:	3.066	1.	Z2= 74.6175	3.081	
208. VOLTS	LN/LN:	3.222		Z0= 125.1525		
	LN/LN/GND:	3.726 (	2.582 GND RETURN KA)			
4LLSB	3P Duty:	1.937	2.	Z1= 143.2939	2.030	1.984
	SLG DUTY:	1.940	2.	Z2= 143.2939	2.010	
208. VOLTS	LN/LN:	1.678		Z0= 143.2435		
	LN/LN/GND:	2.000 (	1.940 GND RETURN KA)			
4LLSC	3P Duty:	2.193	1.	Z1= 126.5780	2.194	2.194
	SLG DUTY:	1.519	1.	Z2= 126.5780	1.519	
208. VOLTS	LN/LN:	1.899		Z0= 299.6540		
	LN/LN/GND:	2.099 (	1.153 GND RETURN KA)			
4LLSD	3P Duty:	1.390	1.	Z1= 199.7522	1.397	1.393
	SLG DUTY:	1.143	1.	Z2= 199.7522	1.144	
208. VOLTS	LN/LN:	1.203		Z0= 337.6042		
	LN/LN/GND:	1.398 (	0.960 GND RETURN KA)			
4LNA	3P Duty:	6.374	2.	Z1= 43.5452	6.775	6.576
	SLG DUTY:	5.074	2.	Z2= 43.5452	5.236	
208. VOLTS	LN/LN:	5.520		Z0= 77.7543		
	LN/LN/GND:	6.187 (	4.196 GND RETURN KA)			
4LNB	3P Duty:	2.321	3.	Z1= 119.6141	2.546	2.434
	SLG DUTY:	2.364	3.	Z2= 119.6141	2.576	
208. VOLTS	LN/LN:	2.010		Z0= 113.0057		
	LN/LN/GND:	2.368 (	2.410 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
4LNC	3P Duty:	3.259	1.	Z1= 85.1769	3.263	3.261
	SLG DUTY:	2.178	1.	Z2= 85.1769	2.178	
208. VOLTS	LN/LN:	2.822		Z0= 214.2863		
	LN/LN/GND:	3.076 (	1.626	GND RETURN KA)		
5HCCB	3P Duty:	10.923	2.	Z1= 11.0117	11.489	11.208
	SLG DUTY:	9.226	1.	Z2= 11.0117	9.360	
480. VOLTS	LN/LN:	9.460		Z0= 17.6759		
	LN/LN/GND:	11.156 (	7.868	GND RETURN KA)		
5HLSB	3P Duty:	6.626	1.	Z1= 18.1519	6.674	6.650
	SLG DUTY:	4.761	1.	Z2= 18.1519	4.767	
480. VOLTS	LN/LN:	5.739		Z0= 40.3174		
	LN/LN/GND:	6.431 (	3.677	GND RETURN KA)		
5HNB	3P Duty:	11.890	3.	Z1= 10.1163	13.442	12.678
	SLG DUTY:	10.691	2.	Z2= 10.1163	11.377	
480. VOLTS	LN/LN:	10.297		Z0= 13.7825		
	LN/LN/GND:	12.149 (	9.637	GND RETURN KA)		
5LCCA	3P Duty:	5.584	2.	Z1= 49.7068	5.995	5.791
	SLG DUTY:	4.707	2.	Z2= 49.7068	4.895	
208. VOLTS	LN/LN:	4.836		Z0= 78.2495		
	LN/LN/GND:	5.501 (	4.051	GND RETURN KA)		
5LCCB	3P Duty:	4.009	3.	Z1= 69.2342	4.426	4.220
	SLG DUTY:	4.192	3.	Z2= 69.2342	4.630	
208. VOLTS	LN/LN:	3.472		Z0= 60.1885		
	LN/LN/GND:	4.105 (	4.392	GND RETURN KA)		
5LEQA	3P Duty:	6.395	2.	Z1= 43.4061	6.846	6.622
	SLG DUTY:	5.303	2.	Z2= 43.4061	5.496	
208. VOLTS	LN/LN:	5.538		Z0= 70.9634		
	LN/LN/GND:	6.285 (	4.509	GND RETURN KA)		
5LEQB	3P Duty:	2.220	1.	Z1= 125.0560	2.241	2.230
	SLG DUTY:	2.210	1.	Z2= 125.0560	2.226	
208. VOLTS	LN/LN:	1.922		Z0= 126.9845		
	LN/LN/GND:	2.274 (	2.199	GND RETURN KA)		

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
5LLSA	3P Duty:	3.720	2.	Z1= 74.6175	3.782	3.751
	SLG DUTY:	3.066	1.	Z2= 74.6175	3.081	
208. VOLTS	LN/LN:	3.222		Z0= 125.1525		
	LN/LN/GND:	3.726 (	2.582 GND RETURN KA)			
5LLSB	3P Duty:	1.985	2.	Z1= 139.8566	2.099	2.042
	SLG DUTY:	2.050	2.	Z2= 139.8566	2.167	
208. VOLTS	LN/LN:	1.719		Z0= 126.4428		
	LN/LN/GND:	2.024 (	2.120 GND RETURN KA)			
5LNA	3P Duty:	6.284	2.	Z1= 44.1748	6.672	6.479
	SLG DUTY:	4.984	2.	Z2= 44.1748	5.140	
208. VOLTS	LN/LN:	5.442		Z0= 79.4527		
	LN/LN/GND:	6.093 (	4.113 GND RETURN KA)			
5LNB	3P Duty:	2.312	3.	Z1= 120.0816	2.535	2.424
	SLG DUTY:	2.358	3.	Z2= 120.0816	2.569	
208. VOLTS	LN/LN:	2.002		Z0= 113.0057		
	LN/LN/GND:	2.359 (	2.406 GND RETURN KA)			
6HEQA	3P Duty:	9.684	3.	Z1= 12.4210	10.571	10.132
	SLG DUTY:	7.961	2.	Z2= 12.4210	8.276	
480. VOLTS	LN/LN:	8.386		Z0= 20.8403		
	LN/LN/GND:	9.614 (	6.707 GND RETURN KA)			
6HEQB	3P Duty:	11.059	3.	Z1= 10.8762	12.324	11.701
	SLG DUTY:	9.640	2.	Z2= 10.8762	10.156	
480. VOLTS	LN/LN:	9.577		Z0= 15.9751		
	LN/LN/GND:	11.181 (	8.478 GND RETURN KA)			
6HNA	3P Duty:	9.695	3.	Z1= 12.4060	10.595	10.150
	SLG DUTY:	8.039	2.	Z2= 12.4060	8.369	
480. VOLTS	LN/LN:	8.396		Z0= 20.4182		
	LN/LN/GND:	9.638 (	6.814 GND RETURN KA)			
6HNB	3P Duty:	11.369	3.	Z1= 10.5796	12.745	12.067
	SLG DUTY:	10.042	2.	Z2= 10.5796	10.625	
480. VOLTS	LN/LN:	9.846		Z0= 15.0539		
	LN/LN/GND:	11.541 (	8.923 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
6LCCA	3P Duty:	5.316	2.	Z1= 52.2175	5.684	5.501
	SLG DUTY:	4.414	2.	Z2= 52.2175	4.577	
208. VOLTS	LN/LN:	4.604		Z0= 85.0307		
	LN/LN/GND:	5.214 (	3.758 GND RETURN KA)			
6LCCB	3P Duty:	3.833	3.	Z1= 72.4129	4.162	4.000
	SLG DUTY:	3.897	2.	Z2= 72.4129	4.183	
208. VOLTS	LN/LN:	3.320		Z0= 68.9571		
	LN/LN/GND:	3.943 (	3.961 GND RETURN KA)			
6LEQA	3P Duty:	6.045	2.	Z1= 45.9194	6.444	6.246
	SLG DUTY:	4.933	2.	Z2= 45.9194	5.099	
208. VOLTS	LN/LN:	5.235		Z0= 77.7543		
	LN/LN/GND:	5.914 (	4.148 GND RETURN KA)			
6LEQB	3P Duty:	2.295	1.	Z1= 120.9391	2.322	2.309
	SLG DUTY:	2.338	1.	Z2= 120.9391	2.361	
208. VOLTS	LN/LN:	1.988		Z0= 114.4575		
	LN/LN/GND:	2.350 (	2.381 GND RETURN KA)			
6LLSA	3P Duty:	3.551	1.	Z1= 78.1663	3.602	3.577
	SLG DUTY:	2.878	1.	Z2= 78.1663	2.889	
208. VOLTS	LN/LN:	3.075		Z0= 135.9307		
	LN/LN/GND:	3.538 (	2.396 GND RETURN KA)			
6LLSB	3P Duty:	1.909	2.	Z1= 145.4017	1.991	1.950
	SLG DUTY:	1.921	2.	Z2= 145.4017	1.985	
208. VOLTS	LN/LN:	1.653		Z0= 143.2435		
	LN/LN/GND:	1.968 (	1.930 GND RETURN KA)			
6LNA	3P Duty:	5.944	2.	Z1= 46.6950	6.291	6.119
	SLG DUTY:	4.656	2.	Z2= 46.6950	4.792	
208. VOLTS	LN/LN:	5.148		Z0= 86.2482		
	LN/LN/GND:	5.744 (	3.810 GND RETURN KA)			
6LNB	3P Duty:	2.303	3.	Z1= 120.5491	2.523	2.414
	SLG DUTY:	2.352	3.	Z2= 120.5491	2.561	
208. VOLTS	LN/LN:	1.994		Z0= 113.0057		
	LN/LN/GND:	2.351 (	2.403 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
7-1LNA	3P Duty:	12.189	4.	Z1= 22.7718	14.142	13.184
	SLG DUTY:	12.082	3.	Z2= 22.7718	13.585	
208. VOLTS	LN/LN:	10.556		Z0= 23.4842		
	LN/LN/GND:	12.529 (11.958 GND RETURN KA)				
7-1LNB	3P Duty:	8.185	3.	Z1= 33.9131	8.875	8.533
	SLG DUTY:	6.887	2.	Z2= 33.9131	7.210	
208. VOLTS	LN/LN:	7.088		Z0= 53.5860		
	LN/LN/GND:	8.052 (5.920 GND RETURN KA)				
7-1NLC	3P Duty:	5.972	2.	Z1= 46.4757	6.318	6.146
	SLG DUTY:	4.634	2.	Z2= 46.4757	4.770	
208. VOLTS	LN/LN:	5.172		Z0= 87.4931		
	LN/LN/GND:	5.751 (3.770 GND RETURN KA)				
ATS 7 Load Sid	3P Duty:	4.468	6.	Z1= 3.1062	5.911	5.217
	SLG DUTY:			Z2= 3.1062	0.000	
4160. VOLTS	LN/LN:	3.869		Z0= INFINITE		
	LN/LN/GND:	3.869 (0.000 GND RETURN KA)				
BHCCA	3P Duty:	14.145	4.	Z1= 8.5032	16.593	15.394
	SLG DUTY:	13.754	3.	Z2= 8.5032	15.046	
480. VOLTS	LN/LN:	12.250		Z0= 9.4339		
	LN/LN/GND:	14.941 (13.280 GND RETURN KA)				
BHCCB	3P Duty:	14.961	4.	Z1= 8.0399	17.966	16.499
	SLG DUTY:	15.018	3.	Z2= 8.0399	16.816	
480. VOLTS	LN/LN:	12.956		Z0= 8.1050		
	LN/LN/GND:	15.973 (14.977 GND RETURN KA)				
BHEQA	3P Duty:	14.376	4.	Z1= 8.3667	16.945	15.688
	SLG DUTY:	13.770	3.	Z2= 8.3667	15.046	
480. VOLTS	LN/LN:	12.450		Z0= 9.7014		
	LN/LN/GND:	15.130 (13.097 GND RETURN KA)				
BHEQB	3P Duty:	14.823	4.	Z1= 8.1147	17.714	16.302
	SLG DUTY:	14.770	3.	Z2= 8.1147	16.451	
480. VOLTS	LN/LN:	12.837		Z0= 8.3694		
	LN/LN/GND:	15.787 (14.616 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
BHLSA	3P Duty:	8.551	3.	Z1= 14.0670	9.266	8.912
	SLG DUTY:	6.905	2.	Z2= 14.0670	7.168	
480. VOLTS	LN/LN:	7.405		Z0= 24.4638		
	LN/LN/GND:	8.404 (5.754 GND RETURN KA)				
BHLSB	3P Duty:	9.588	3.	Z1= 12.5444	10.533	10.066
	SLG DUTY:	8.001	2.	Z2= 12.5444	8.369	
480. VOLTS	LN/LN:	8.304		Z0= 20.3208		
	LN/LN/GND:	9.525 (6.819 GND RETURN KA)				
BHNA	3P Duty:	15.010	4.	Z1= 8.0132	17.979	16.530
	SLG DUTY:	14.912	3.	Z2= 8.0132	16.607	
480. VOLTS	LN/LN:	12.999		Z0= 8.3476		
	LN/LN/GND:	15.988 (14.707 GND RETURN KA)				
BHNB	3P Duty:	15.368	4.	Z1= 7.8268	18.644	17.048
	SLG DUTY:	15.696	3.	Z2= 7.8268	17.791	
480. VOLTS	LN/LN:	13.309		Z0= 7.4685		
	LN/LN/GND:	16.510 (15.946 GND RETURN KA)				
BLCCA	3P Duty:	9.906	4.	Z1= 28.0199	11.721	10.834
	SLG DUTY:	10.964	4.	Z2= 28.0199	12.937	
208. VOLTS	LN/LN:	8.579		Z0= 19.9134		
	LN/LN/GND:	10.578 (12.274 GND RETURN KA)				
BLCCB	3P Duty:	10.028	4.	Z1= 27.6804	11.926	10.998
	SLG DUTY:	11.063	4.	Z2= 27.6804	13.101	
208. VOLTS	LN/LN:	8.684		Z0= 19.9134		
	LN/LN/GND:	10.698 (12.336 GND RETURN KA)				
BLCCC	3P Duty:	2.471	1.	Z1= 112.3290	2.471	2.471
	SLG DUTY:	1.609	1.	Z2= 112.3290	1.609	
208. VOLTS	LN/LN:	2.140		Z0= 296.0801		
	LN/LN/GND:	2.325 (1.186 GND RETURN KA)				
BLCCD	3P Duty:	6.524	1.	Z1= 42.5480	6.597	6.560
	SLG DUTY:	5.414	1.	Z2= 42.5480	5.423	
208. VOLTS	LN/LN:	5.650		Z0= 71.7766		
	LN/LN/GND:	6.697 (4.538 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
BLCCE	3P Duty:	4.241	1.	Z1= 65.4544	4.245	4.243
	SLG DUTY:	3.009	1.	Z2= 65.4544	3.009	
208. VOLTS	LN/LN:	3.673		Z0= 149.2865		
	LN/LN/GND:	4.120 (	2.304 GND RETURN KA)			
BLEQA	3P Duty:	12.417	4.	Z1= 22.3547	14.972	13.725
	SLG DUTY:	14.138	4.	Z2= 22.3547	17.064	
208. VOLTS	LN/LN:	10.753		Z0= 14.1888		
	LN/LN/GND:	13.511 (	16.414 GND RETURN KA)			
BLEQB	3P Duty:	4.178	3.	Z1= 66.4312	4.703	4.445
	SLG DUTY:	4.314	3.	Z2= 66.4312	4.827	
208. VOLTS	LN/LN:	3.619		Z0= 60.1885		
	LN/LN/GND:	4.282 (	4.458 GND RETURN KA)			
BLEQC	3P Duty:	2.971	1.	Z1= 93.4206	2.997	2.984
	SLG DUTY:	2.279	1.	Z2= 93.4206	2.284	
208. VOLTS	LN/LN:	2.573		Z0= 181.9093		
	LN/LN/GND:	2.910 (	1.832 GND RETURN KA)			
BLEQD	3P Duty:	2.860	1.	Z1= 97.0409	2.883	2.872
	SLG DUTY:	2.172	1.	Z2= 97.0409	2.176	
208. VOLTS	LN/LN:	2.477		Z0= 192.7539		
	LN/LN/GND:	2.792 (	1.735 GND RETURN KA)			
BLEQE	3P Duty:	7.002	3.	Z1= 39.6443	7.555	7.281
	SLG DUTY:	5.974	2.	Z2= 39.6443	6.224	
208. VOLTS	LN/LN:	6.064		Z0= 60.7869		
	LN/LN/GND:	6.941 (	5.184 GND RETURN KA)			
BLEQF	3P Duty:	6.468	2.	Z1= 42.9152	6.840	6.655
	SLG DUTY:	5.350	2.	Z2= 42.9152	5.491	
208. VOLTS	LN/LN:	5.601		Z0= 70.7746		
	LN/LN/GND:	6.388 (	4.534 GND RETURN KA)			
BLEQG	3P Duty:	5.941	1.	Z1= 46.7210	6.017	5.979
	SLG DUTY:	4.604	1.	Z2= 46.7210	4.616	
208. VOLTS	LN/LN:	5.145		Z0= 89.5629		
	LN/LN/GND:	5.876 (	3.716 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
BLEQH	3P Duty:	7.864	2.	Z1= 35.2978	8.111	7.988
	SLG DUTY:	6.750	1.	Z2= 35.2978	6.808	
208. VOLTS	LN/LN:	6.810		Z0= 54.4930		
	LN/LN/GND:	8.055 (	5.832 GND RETURN KA)			
BLEQI	3P Duty:	7.161	2.	Z1= 38.7640	7.324	7.243
	SLG DUTY:	5.912	1.	Z2= 38.7640	5.945	
208. VOLTS	LN/LN:	6.201		Z0= 65.2404		
	LN/LN/GND:	7.236 (	4.967 GND RETURN KA)			
BLEQJ	3P Duty:	2.658	1.	Z1= 104.4156	2.677	2.668
	SLG DUTY:	2.117	1.	Z2= 104.4156	2.119	
208. VOLTS	LN/LN:	2.302		Z0= 190.0021		
	LN/LN/GND:	2.661 (	1.735 GND RETURN KA)			
BLLSA	3P Duty:	6.397	3.	Z1= 43.3914	7.193	6.801
	SLG DUTY:	7.119	3.	Z2= 43.3914	8.017	
208. VOLTS	LN/LN:	5.540		Z0= 30.1970		
	LN/LN/GND:	6.824 (	8.024 GND RETURN KA)			
BLLSB	3P Duty:	3.624	2.	Z1= 76.6028	3.852	3.739
	SLG DUTY:	3.637	2.	Z2= 76.6028	3.781	
208. VOLTS	LN/LN:	3.138		Z0= 76.6235		
	LN/LN/GND:	3.819 (	3.637 GND RETURN KA)			
BLLSC	3P Duty:	1.872	1.	Z1= 148.2379	1.873	1.873
	SLG DUTY:	1.239	0.	Z2= 148.2379	1.239	
208. VOLTS	LN/LN:	1.622		Z0= 380.1686		
	LN/LN/GND:	1.771 (	0.920 GND RETURN KA)			
BLLSD	3P Duty:	4.699	1.	Z1= 59.0714	4.759	4.729
	SLG DUTY:	4.144	1.	Z2= 59.0714	4.153	
208. VOLTS	LN/LN:	4.069		Z0= 86.7363		
	LN/LN/GND:	4.918 (	3.635 GND RETURN KA)			
BLLSE	3P Duty:	3.610	1.	Z1= 76.8817	3.658	3.634
	SLG DUTY:	2.931	1.	Z2= 76.8817	2.940	
208. VOLTS	LN/LN:	3.127		Z0= 133.5163		
	LN/LN/GND:	3.607 (	2.440 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
BLLSF	3P Duty:	3.765	2.	Z1= 73.7334	3.830	3.797
	SLG DUTY:	3.117	1.	Z2= 73.7334	3.132	
208. VOLTS	LN/LN:	3.260		Z0= 122.4614		
	LN/LN/GND:	3.776 (2.633 GND RETURN KA)				
BLLSG	3P Duty:	2.294	1.	Z1= 121.0189	2.300	2.297
	SLG DUTY:	1.777	1.	Z2= 121.0189	1.778	
208. VOLTS	LN/LN:	1.986		Z0= 233.2151		
	LN/LN/GND:	2.283 (1.431 GND RETURN KA)				
BLNA	3P Duty:	13.903	4.	Z1= 19.9642	16.864	15.421
	SLG DUTY:	15.387	4.	Z2= 19.9642	18.654	
208. VOLTS	LN/LN:	12.041		Z0= 14.1888		
	LN/LN/GND:	14.810 (17.226 GND RETURN KA)				
BLNC	3P Duty:	3.767	1.	Z1= 73.6878	3.779	3.773
	SLG DUTY:	2.588	1.	Z2= 73.6878	2.589	
208. VOLTS	LN/LN:	3.262		Z0= 176.5314		
	LN/LN/GND:	3.579 (1.959 GND RETURN KA)				
BLND	3P Duty:	9.396	2.	Z1= 29.5410	9.777	9.588
	SLG DUTY:	8.196	1.	Z2= 29.5410	8.300	
208. VOLTS	LN/LN:	8.137		Z0= 43.8244		
	LN/LN/GND:	9.646 (7.176 GND RETURN KA)				
BLNE	3P Duty:	5.277	1.	Z1= 52.5961	5.314	5.296
	SLG DUTY:	3.834	1.	Z2= 52.5961	3.839	
208. VOLTS	LN/LN:	4.570		Z0= 113.9788		
	LN/LN/GND:	5.105 (2.984 GND RETURN KA)				
BLNF	3P Duty:	3.450	1.	Z1= 80.4502	3.456	3.453
	SLG DUTY:	2.500	1.	Z2= 80.4502	2.500	
208. VOLTS	LN/LN:	2.988		Z0= 176.3781		
	LN/LN/GND:	3.367 (1.937 GND RETURN KA)				
BUS UTIL	3P Duty:	5.765	5.	Z1= 0.8031	7.232	6.520
	SLG DUTY:	0.725	5.	Z2= 0.8031	0.913	
12470. VOLTS	LN/LN:	4.993		Z0= 17.5496		
	LN/LN/GND:	4.996 (0.387 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
CCSWBD	3P Duty:	17.992	7.	Z1= 6.6855	24.195	21.216
	SLG DUTY:	20.402	6.	Z2= 6.6855	26.962	
480. VOLTS	LN/LN:	15.581		Z0= 4.3198		
	LN/LN/GND:	19.781 (23.553 GND RETURN KA)				
DIST PNL R	3P Duty:	7.527	3.	Z1= 36.8774	8.376	7.957
	SLG DUTY:	7.066	2.	Z2= 36.8774	7.579	
208. VOLTS	LN/LN:	6.518		Z0= 44.4972		
	LN/LN/GND:	7.660 (6.635 GND RETURN KA)				
EMER RM 360	3P Duty:	2.609	1.	Z1= 106.3820	2.627	2.618
	SLG DUTY:	2.095	1.	Z2= 106.3820	2.097	
208. VOLTS	LN/LN:	2.260		Z0= 190.0021		
	LN/LN/GND:	2.615 (1.728 GND RETURN KA)				
EQSWBD	3P Duty:	18.037	7.	Z1= 6.6685	24.276	21.280
	SLG DUTY:	20.441	6.	Z2= 6.6685	27.029	
480. VOLTS	LN/LN:	15.621		Z0= 4.3198		
	LN/LN/GND:	19.826 (23.579 GND RETURN KA)				
EQUIP RM 372	3P Duty:	1.607	1.	Z1= 172.7178	1.619	1.613
	SLG DUTY:	1.315	1.	Z2= 172.7178	1.317	
208. VOLTS	LN/LN:	1.392		Z0= 296.2958		
	LN/LN/GND:	1.619 (1.098 GND RETURN KA)				
LSS 1	3P Duty:	4.319	7.	Z1= 3.2131	5.890	5.138
	SLG DUTY:			Z2= 3.2131	0.000	
4160. VOLTS	LN/LN:	3.741		Z0= INFINITE		
	LN/LN/GND:	3.741 (0.000 GND RETURN KA)				
LSS 2	3P Duty:	4.469	7.	Z1= 3.1057	6.076	5.305
	SLG DUTY:			Z2= 3.1057	0.000	
4160. VOLTS	LN/LN:	3.870		Z0= INFINITE		
	LN/LN/GND:	3.870 (0.000 GND RETURN KA)				
LSSWBD	3P Duty:	17.629	6.	Z1= 6.8229	23.243	20.539
	SLG DUTY:	19.731	5.	Z2= 6.8229	25.226	
480. VOLTS	LN/LN:	15.267		Z0= 4.6560		
	LN/LN/GND:	19.389 (22.386 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
LVA-A	3P Duty:	18.474	8.	Z1= 6.5109	25.282	22.021
	SLG DUTY:	21.356	8.	Z2= 6.5109	29.217	
480. VOLTS	LN/LN:	15.999		Z0= 3.8744		
	LN/LN/GND:	20.385 (25.305 GND RETURN KA)				
LVA-B	3P Duty:	18.477	8.	Z1= 6.5097	25.298	22.031
	SLG DUTY:	21.404	8.	Z2= 6.5097	29.413	
480. VOLTS	LN/LN:	16.002		Z0= 3.8400		
	LN/LN/GND:	20.362 (25.431 GND RETURN KA)				
MP5C-1	3P Duty:	4.454	2.	Z1= 62.3227	4.669	4.562
	SLG DUTY:	3.391	2.	Z2= 62.3227	3.471	
208. VOLTS	LN/LN:	3.857		Z0= 121.9598		
	LN/LN/GND:	4.273 (2.726 GND RETURN KA)				
MP5C-2	3P Duty:	4.400	2.	Z1= 63.0817	4.611	4.506
	SLG DUTY:	3.342	2.	Z2= 63.0817	3.420	
208. VOLTS	LN/LN:	3.811		Z0= 124.0016		
	LN/LN/GND:	4.219 (2.684 GND RETURN KA)				
MVS 1	3P Duty:	4.468	7.	Z1= 3.1059	6.075	5.305
	SLG DUTY:			Z2= 3.1059	0.000	
4160. VOLTS	LN/LN:	3.870		Z0= INFINITE		
	LN/LN/GND:	3.870 (0.000 GND RETURN KA)				
MVS 2	3P Duty:	4.468	7.	Z1= 3.1059	6.075	5.305
	SLG DUTY:			Z2= 3.1059	0.000	
4160. VOLTS	LN/LN:	3.870		Z0= INFINITE		
	LN/LN/GND:	3.870 (0.000 GND RETURN KA)				
PHEQA	3P Duty:	11.517	3.	Z1= 10.4434	12.790	12.162
	SLG DUTY:	9.739	2.	Z2= 10.4434	10.149	
480. VOLTS	LN/LN:	9.974		Z0= 16.5741		
	LN/LN/GND:	11.646 (8.345 GND RETURN KA)				
PLEQA	3P Duty:	8.705	4.	Z1= 31.8852	10.370	9.557
	SLG DUTY:	8.335	4.	Z2= 31.8852	9.836	
208. VOLTS	LN/LN:	7.539		Z0= 36.1349		
	LN/LN/GND:	8.579 (7.995 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
PLNA	3P Duty:	4.780	1.	Z1= 58.0666	4.807	4.793
	SLG DUTY:	3.407	1.	Z2= 58.0666	3.411	
208. VOLTS	LN/LN:	4.140		Z0= 130.2819		
	LN/LN/GND:	4.596 (	2.626 GND RETURN KA)			
PNL A	3P Duty:	2.480	1.	Z1= 111.9371	2.480	2.480
	SLG DUTY:	1.669	1.	Z2= 111.9371	1.669	
208. VOLTS	LN/LN:	2.147		Z0= 279.3438		
	LN/LN/GND:	2.361 (	1.248 GND RETURN KA)			
PNL B	3P Duty:	6.376	2.	Z1= 43.5331	6.516	6.446
	SLG DUTY:	5.180	1.	Z2= 43.5331	5.211	
208. VOLTS	LN/LN:	5.522		Z0= 75.4064		
	LN/LN/GND:	6.366 (	4.317 GND RETURN KA)			
PNL BIO MED	3P Duty:	1.743	1.	Z1= 159.2663	1.744	1.743
	SLG DUTY:	1.210	1.	Z2= 159.2663	1.210	
208. VOLTS	LN/LN:	1.509		Z0= 376.3403		
	LN/LN/GND:	1.674 (	0.918 GND RETURN KA)			
PNL L	3P Duty:	2.623	1.	Z1= 105.8075	2.624	2.624
	SLG DUTY:	1.776	1.	Z2= 105.8075	1.776	
208. VOLTS	LN/LN:	2.272		Z0= 261.3840		
	LN/LN/GND:	2.506 (	1.332 GND RETURN KA)			
PNL R	3P Duty:	2.623	1.	Z1= 105.8075	2.624	2.624
	SLG DUTY:	1.776	1.	Z2= 105.8075	1.776	
208. VOLTS	LN/LN:	2.272		Z0= 261.3840		
	LN/LN/GND:	2.506 (	1.332 GND RETURN KA)			
PNL UTIL SHOP	3P Duty:	5.829	1.	Z1= 47.6151	5.900	5.865
	SLG DUTY:	4.493	1.	Z2= 47.6151	4.504	
208. VOLTS	LN/LN:	5.048		Z0= 92.2726		
	LN/LN/GND:	5.755 (	3.614 GND RETURN KA)			
PNL UTIL SHOP	3P Duty:	3.705	1.	Z1= 74.9216	3.719	3.712
	SLG DUTY:	2.592	1.	Z2= 74.9216	2.594	
208. VOLTS	LN/LN:	3.208		Z0= 173.8093		
	LN/LN/GND:	3.542 (	1.979 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
PNL UTIL SHOP	3P Duty:	3.450	1.	Z1= 80.4480	3.462	3.456
	SLG DUTY:	2.389	1.	Z2= 80.4480	2.390	
208. VOLTS	LN/LN:	2.988		Z0= 190.1438		
	LN/LN/GND:	3.287 (1.815 GND RETURN KA)				
RP5L	3P Duty:	2.517	1.	Z1= 110.2597	2.519	2.518
	SLG DUTY:	1.670	1.	Z2= 110.2597	1.670	
208. VOLTS	LN/LN:	2.180		Z0= 281.2008		
	LN/LN/GND:	2.377 (1.242 GND RETURN KA)				
RP6L	3P Duty:	2.311	1.	Z1= 120.0852	2.312	2.312
	SLG DUTY:	1.519	1.	Z2= 120.0852	1.519	
208. VOLTS	LN/LN:	2.002		Z0= 311.1646		
	LN/LN/GND:	2.175 (1.125 GND RETURN KA)				
RP6R	3P Duty:	2.625	1.	Z1= 105.7246	2.646	2.636
	SLG DUTY:	2.143	1.	Z2= 105.7246	2.147	
208. VOLTS	LN/LN:	2.274		Z0= 181.9598		
	LN/LN/GND:	2.639 (1.789 GND RETURN KA)				
SWGR 1	3P Duty:	4.403	8.	Z1= 3.1523	6.077	5.276
	SLG DUTY:			Z2= 3.1523	0.000	
4160. VOLTS	LN/LN:	3.813		Z0= INFINITE		
	LN/LN/GND:	3.813 (0.000 GND RETURN KA)				
SWGR 2	3P Duty:	4.551	8.	Z1= 3.0493	6.263	5.444
	SLG DUTY:			Z2= 3.0493	0.000	
4160. VOLTS	LN/LN:	3.942		Z0= INFINITE		
	LN/LN/GND:	3.942 (0.000 GND RETURN KA)				
SWGR PARALLEL	3P Duty:	16.070	19.	Z1= 7.4851	25.052	20.833
	SLG DUTY:	15.978	18.	Z2= 7.4851	24.809	
480. VOLTS	LN/LN:	13.917		Z0= 7.6132		
	LN/LN/GND:	16.054 (15.888 GND RETURN KA)				

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	D U T I E S (KA) X/R
1 HNB	480.	14.527	4.00	14.369	2.92
19-1LEQA	208.	2.610	2.37	2.692	2.47
19-1LNA	208.	2.656	2.65	2.724	2.67
1CA	208.	1.991	0.55	1.238	0.43
1CB	208.	4.034	1.22	2.823	0.95
1CC	208.	2.311	0.59	1.451	0.46
1CD	208.	3.831	1.19	2.659	0.93
1HCCB	480.	14.160	3.85	13.792	2.79
1HLSB	480.	9.150	2.54	7.500	1.88
1LCCA	208.	7.481	2.71	7.026	2.18
1LCCB	208.	7.206	3.43	7.642	3.26
1LCCC	208.	2.782	0.80	1.857	0.60
1LCCD	208.	4.038	1.54	3.212	1.16
1LCCE	208.	3.937	1.51	3.106	1.14
1LEQA	208.	7.349	2.58	6.376	2.05
1LEQB	208.	2.244	2.46	2.230	2.20
1LLSA	208.	4.107	1.67	3.523	1.27
1LLSB	208.	3.884	2.92	4.100	2.90
1LLSC	208.	2.261	0.84	1.569	0.62
1LLSD	208.	2.168	1.02	1.646	0.73
1LNA	208.	9.232	2.54	8.190	1.98
1LNB	208.	7.375	3.54	7.896	3.44
1LNC	208.	3.210	0.92	2.284	0.66
1WC	208.	3.736	1.18	2.584	0.93
2HEQA	480.	10.579	2.85	8.938	2.05
2HEQB	480.	12.993	3.46	12.107	2.49
2HNA	480.	10.485	2.84	8.912	2.07
2HNB	480.	13.768	3.73	13.239	2.71
2LCCA	208.	7.215	2.62	6.661	2.09
2LCCB	208.	6.774	3.22	6.924	2.92
2LCCC	208.	3.796	1.36	2.792	1.04
2LCCD	208.	3.657	1.30	2.661	1.00
2LCCE	208.	3.431	1.02	2.505	0.74
2LCCF	208.	3.431	1.02	2.505	0.74
2LEQA	208.	6.893	2.49	5.851	1.98
2LEQB	208.	2.328	2.75	2.370	2.65
2LLSA	208.	3.905	1.60	3.280	1.21
2LLSB	208.	3.624	2.30	3.637	1.95
2LLSC	208.	1.964	0.78	1.329	0.58
2LLSD	208.	2.386	1.19	1.894	0.86
2LNA	208.	8.827	2.44	7.693	1.90
2LNB	208.	2.339	2.76	2.377	2.66
3A EM	208.	2.501	0.78	1.652	0.59
3A1	208.	3.868	2.11	2.973	1.71

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	D U T I E S (KA) X/R
3HCCB	480.	12.299	2.57	10.993	1.78
3HLSB	480.	7.644	1.58	5.761	1.15
3HNB	480.	13.082	3.51	12.269	2.54
3LCCA	208.	5.960	2.53	5.133	2.03
3LCCB	208.	4.076	2.95	4.240	2.92
3LCCC	208.	4.148	1.64	3.159	1.27
3LEQA	208.	6.893	2.49	5.851	1.98
3LEQB	208.	2.232	2.45	2.222	2.20
3LLSA	208.	3.905	1.60	3.280	1.21
3LLSB	208.	2.014	2.32	2.071	2.28
3LLSC	208.	1.913	0.76	1.289	0.57
3LLSD	208.	1.516	1.33	1.303	1.02
3LNA	208.	6.765	2.36	5.466	1.88
3LNB	208.	2.330	2.76	2.371	2.66
3LNC	208.	4.503	1.53	3.266	1.20
4AD	208.	3.996	1.63	3.023	1.27
4C	208.	3.996	1.63	3.023	1.27
4DP	208.	3.613	2.07	2.741	1.68
4EML	208.	3.360	1.76	2.490	1.41
4HEQA	480.	10.162	2.77	8.477	2.01
4HEQB	480.	12.090	3.21	10.914	2.33
4HNA	480.	6.932	2.27	5.296	1.73
4HNB	480.	12.459	3.33	11.428	2.42
4L	208.	3.502	1.93	2.631	1.56
4LA	208.	3.484	1.90	2.611	1.53
4LCCA	208.	5.656	2.46	4.787	1.98
4LCCB	208.	3.827	2.41	3.815	2.09
4LEQA	208.	6.489	2.42	5.404	1.92
4LEQB	208.	2.315	2.74	2.360	2.65
4LEQC	208.	4.046	1.47	2.944	1.15
4LLSA	208.	3.720	1.54	3.066	1.17
4LLSB	208.	1.937	2.09	1.940	1.90
4LLSC	208.	2.193	0.86	1.519	0.64
4LLSD	208.	1.390	1.19	1.143	0.89
4LNA	208.	6.374	2.30	5.074	1.83
4LNB	208.	2.321	2.75	2.364	2.65
4LNC	208.	3.259	0.95	2.178	0.74
5HCCB	480.	10.923	2.14	9.226	1.49
5HLSB	480.	6.626	1.27	4.761	0.93
5HNB	480.	11.890	3.18	10.691	2.31
5LCCA	208.	5.584	2.44	4.707	1.96

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	D U T I E S (KA) X/R
5LCCB	208.	4.009	2.84	4.192	2.85
5LEQA	208.	6.395	2.40	5.303	1.91
5LEQB	208.	2.220	1.35	2.210	1.27
5LLSA	208.	3.720	1.54	3.066	1.17
5LLSB	208.	1.985	2.23	2.050	2.21
5LNA	208.	6.284	2.28	4.984	1.82
5LNB	208.	2.312	2.74	2.358	2.65
6HEQA	480.	9.684	2.68	7.961	1.96
6HEQB	480.	11.059	2.97	9.640	2.17
6HNA	480.	9.695	2.69	8.039	1.98
6HNB	480.	11.369	3.06	10.042	2.23
6LCCA	208.	5.316	2.38	4.414	1.92
6LCCB	208.	3.833	2.60	3.897	2.44
6LEQA	208.	6.045	2.34	4.933	1.86
6LEQB	208.	2.295	1.41	2.338	1.37
6LLSA	208.	3.551	1.49	2.878	1.13
6LLSB	208.	1.909	2.01	1.921	1.86
6LNA	208.	5.944	2.23	4.656	1.79
6LNB	208.	2.303	2.73	2.352	2.64
7-1LNA	208.	12.189	3.58	12.082	3.11
7-1LNB	208.	8.185	2.58	6.887	2.07
7-1NLC	208.	5.972	2.23	4.634	1.79
ATS 7 Load Sid	4160.	4.468	6.41		
BHCCA	480.	14.145	3.76	13.754	2.71
BHCCB	480.	14.961	4.16	15.018	3.04
BHEQA	480.	14.376	3.84	13.770	2.69
BHEQB	480.	14.823	4.08	14.770	2.97
BHLSA	480.	8.551	2.58	6.905	1.93
BHLSB	480.	9.588	2.77	8.001	2.06
BHNA	480.	15.010	4.12	14.912	2.96
BHNB	480.	15.368	4.35	15.696	3.22
BLCCA	208.	9.906	3.90	10.964	3.86
BLCCB	208.	10.028	3.99	11.063	3.92
BLCCC	208.	2.471	0.68	1.609	0.51
BLCCD	208.	6.524	1.40	5.414	0.97
BLCCE	208.	4.241	0.92	3.009	0.65
BLEQA	208.	12.417	4.24	14.138	4.25
BLEQB	208.	4.178	3.12	4.314	3.03
BLEQC	208.	2.971	1.33	2.279	1.01
BLEQD	208.	2.860	1.30	2.172	0.99
BLEQE	208.	7.002	2.51	5.974	1.99

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	X/R
BLEQF	208.	6.468	2.22	5.350	1.74
BLEQG	208.	5.941	1.44	4.604	1.06
BLEQH	208.	7.864	1.82	6.750	1.32
BLEQI	208.	7.161	1.67	5.912	1.21
BLEQJ	208.	2.658	1.27	2.117	0.92
BLLSA	208.	6.397	3.10	7.119	3.13
BLLSB	208.	3.624	2.30	3.637	1.95
BLLSC	208.	1.872	0.65	1.239	0.47
BLLSD	208.	4.699	1.44	4.144	1.02
BLLSE	208.	3.610	1.45	2.931	1.09
BLLSF	208.	3.765	1.55	3.117	1.18
BLLSG	208.	2.294	1.08	1.777	0.77
BLNA	208.	13.903	4.35	15.387	4.34
BLNC	208.	3.767	1.10	2.588	0.85
BLND	208.	9.396	1.97	8.196	1.44
BLNE	208.	5.277	1.27	3.834	0.96
BLNF	208.	3.450	0.98	2.500	0.70
BUS UTIL	12470.	5.765	5.03	0.725	5.11
CCSWBD	480.	17.992	6.94	20.402	6.38
DIST PNL R	208.	7.527	2.95	7.066	2.43
EMER RM 360	208.	2.609	1.26	2.095	0.92
EQSWBD	480.	18.037	6.96	20.441	6.39
EQUIP RM 372	208.	1.607	1.28	1.315	0.95
LSS 1	4160.	4.319	7.44		
LSS 2	4160.	4.469	7.33		
LSSWBD	480.	17.629	6.30	19.731	5.47
LVA-A	480.	18.474	7.58	21.356	7.56
LVA-B	480.	18.477	7.60	21.404	7.74
MP5C-1	208.	4.454	2.09	3.391	1.68
MP5C-2	208.	4.400	2.08	3.342	1.68
MVS 1	4160.	4.468	7.32		
MVS 2	4160.	4.468	7.33		
PHEQA	480.	11.517	2.92	9.739	2.00
PLEQA	208.	8.705	4.02	8.335	3.86
PLNA	208.	4.780	1.21	3.407	0.92
PNL A	208.	2.480	0.74	1.669	0.54
PNL B	208.	6.376	1.65	5.180	1.23
PNL BIO MED	208.	1.743	0.81	1.210	0.59
PNL L	208.	2.623	0.75	1.776	0.54
PNL R	208.	2.623	0.75	1.776	0.54
PNL UTIL SHOP	208.	5.829	1.43	4.493	1.05

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	D U T I E S (KA) X/R
PNL UTIL SHOP	208.	3.705	1.14	2.592	0.87
PNL UTIL SHOP	208.	3.450	1.11	2.389	0.85
RP5L	208.	2.517	0.82	1.670	0.62
RP6L	208.	2.311	0.79	1.519	0.61
RP6R	208.	2.625	1.30	2.143	0.97
SWGR 1	4160.	4.403	7.93		
SWGR 2	4160.	4.551	7.80		
SWGR PARALLEL	480.	16.070	18.75	15.978	18.00

329 FAULTED BUSES, 335 BRANCHES, 8 CONTRIBUTIONS
UNBALANCED FAULTS REQUESTED

*** SHORT CIRCUIT STUDY COMPLETE ***

VA Clarksburg
Utility Contribution

T H R E E P H A S E M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

5LLSA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
5LLSB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
5LNA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
5LNB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6HEQA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
6HEQB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
6HNA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
6HNB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
6LCCA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LCCB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LEQA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LEQB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LLSA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LLSB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LNA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LNB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
7-1LNA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
7-1LNB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
7-1NLC	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)

ATS 7 Load Sid E/Z: 4.449 KA AT -81.10 DEG (32.06 MVA) X/R: 6.43
SYM*1.6: 7.119 KA MOMENTARY BASED ON X/R: 5.890 KA
SYM*2.7: 12.013 KA CREST BASED ON X/R: 10.152 KA
VOLTAGE: 4160. EQUIV. IMPEDANCE= 0.0835 + J 0.5333 OHMS
CBL-0302 BUS-0344 0.000 KA ANG: -23.45
ATS 7 BUS-0342 4.449 KA ANG: -81.10

T H R E E P H A S E M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BLEQJ	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLLSA	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLLSB	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLLSC	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLLSD	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLLSE	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLLSF	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLLSG	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLNA	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLNC	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLND	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLNE	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)
BLNF	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)

BUS UTIL	E/Z:	5.759 KA AT	-78.76 DEG (124.38 MVA)	X/R:	5.03
	SYM*1.6:	9.214 KA	MOMENTARY BASED ON X/R:		7.225 KA
	SYM*2.7:	15.548 KA	CREST BASED ON X/R:		12.507 KA
	VOLTAGE:	12470.	EQUIV. IMPEDANCE=	0.2436 + J 1.2262	OHMS
	CBL-0300	BUS-0338	5.713 KA	ANG:	101.23
	XFMR UTIL 2	BUS-0004	0.046 KA	ANG:	-257.95

T H R E E P H A S E M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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CCSWBD          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

DIST PNL R      VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

EMER RM 360     VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

EQSWBD          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

EQUIP RM 372    VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

LSS 1           E/Z:      4.318 KA AT  -82.35 DEG (  31.11 MVA)  X/R:     7.44
                SYM*1.6:    6.909 KA       MOMENTARY BASED ON X/R:    5.889 KA
                SYM*2.7:   11.659 KA           CREST BASED ON X/R:   10.111 KA
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0741 + J  0.5512  OHMS
                CBL-0006        SWGR 1             4.318 KA      ANG:   -82.35

LSS 2           E/Z:      4.449 KA AT  -82.20 DEG (  32.06 MVA)  X/R:     7.35
                SYM*1.6:    7.118 KA       MOMENTARY BASED ON X/R:    6.052 KA
                SYM*2.7:   12.012 KA           CREST BASED ON X/R:   10.395 KA
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0733 + J  0.5348  OHMS
                CBL-0009        MVS 1              0.000 KA      ANG:   -31.66
                CBL-0013        SWGR 2             4.310 KA      ANG:   -82.34
                CBL-0015        MVS 2              0.140 KA      ANG:  -257.82

LSSWBD          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

LVA-A           VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

LVA-B           VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

MP5C-1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

MP5C-2          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

MVS 1           E/Z:      4.449 KA AT  -82.20 DEG (  32.05 MVA)  X/R:     7.35
                SYM*1.6:    7.118 KA       MOMENTARY BASED ON X/R:    6.051 KA
                SYM*2.7:   12.011 KA           CREST BASED ON X/R:   10.393 KA
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0733 + J  0.5349  OHMS
                CBL-0009        LSS 2              4.449 KA      ANG:    97.80

MVS 2           E/Z:      4.449 KA AT  -82.20 DEG (  32.05 MVA)  X/R:     7.35
                SYM*1.6:    7.118 KA       MOMENTARY BASED ON X/R:    6.051 KA
                SYM*2.7:   12.011 KA           CREST BASED ON X/R:   10.393 KA
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0733 + J  0.5349  OHMS
                CBL-0015        LSS 2              4.309 KA      ANG:   -82.34
                T 1500 B        LVA-B              0.140 KA      ANG:   -77.82

PHEQA           VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )
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U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	4.45	6.4	Z1= 3.1194	7.12	5.89
ATS 7 Load Sid	SLG DUTY:			Z2= 3.1194		
4160. VOLTS	LN/LN	3.85		Z0= INFINITE		
	LN/LN/GND:	3.85 (		0.00 GND RETURN KA)		
	3P Duty:	5.76	5.0	Z1= 0.8040	9.21	7.22
BUS UTIL	SLG DUTY:	0.73	5.1	Z2= 0.8040	1.16	0.91
12470.	VOLTS LN/LN:	4.99		Z0= 17.5496		
	LN/LN/GND:	4.99 (		0.39 GND RETURN KA)		
	3P Duty:	4.32	7.4	Z1= 3.2139	6.91	5.89
LSS 1	SLG DUTY:			Z2= 3.2139		
4160. VOLTS	LN/LN	3.74		Z0= INFINITE		
	LN/LN/GND:	3.74 (		0.00 GND RETURN KA)		
	3P Duty:	4.45	7.3	Z1= 3.1195	7.12	6.05
LSS 2	SLG DUTY:			Z2= 3.1195		
4160. VOLTS	LN/LN	3.85		Z0= INFINITE		
	LN/LN/GND:	3.85 (		0.00 GND RETURN KA)		
	3P Duty:	4.45	7.3	Z1= 3.1197	7.12	6.05
MVS 1	SLG DUTY:			Z2= 3.1197		
4160. VOLTS	LN/LN	3.85		Z0= INFINITE		
	LN/LN/GND:	3.85 (		0.00 GND RETURN KA)		
	3P Duty:	4.45	7.3	Z1= 3.1197	7.12	6.05
MVS 2	SLG DUTY:			Z2= 3.1197		
4160. VOLTS	LN/LN	3.85		Z0= INFINITE		
	LN/LN/GND:	3.85 (		0.00 GND RETURN KA)		
	3P Duty:	4.40	7.9	Z1= 3.1532	7.04	6.08
SWGR 1	SLG DUTY:			Z2= 3.1532		
4160. VOLTS	LN/LN	3.81		Z0= INFINITE		
	LN/LN/GND:	3.81 (		0.00 GND RETURN KA)		
	3P Duty:	4.53	7.8	Z1= 3.0626	7.25	6.24
SWGR 2	SLG DUTY:			Z2= 3.0626		
4160. VOLTS	LN/LN	3.92		Z0= INFINITE		
	LN/LN/GND:	3.92 (		0.00 GND RETURN KA)		

M O M E N T A R Y D U T Y S U M M A R Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
SOLUTION METHOD : E/Z

BUS RECORD NO NAME	VOLTAGE L-L	* 3 P H A S E * KA	X/R	* * * SLG * * * KA	X/R
ATS 7 Load Sid	4160.	5.890	6.43		
BUS UTIL	12470.	7.225	5.03	0.913	5.11
LSS 1	4160.	5.889	7.44		
LSS 2	4160.	6.052	7.35		
MVS 1	4160.	6.051	7.35		
MVS 2	4160.	6.051	7.35		
SWGR 1	4160.	6.076	7.93		
SWGR 2	4160.	6.239	7.82		

14 FAULTED BUSES, 335 BRANCHES, 8 CONTRIBUTIONS
UNBALANCED FAULTS REQUESTED

*** SHORT CIRCUIT STUDY COMPLETE ***

T H R E E P H A S E I N T E R R U P U T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

5LLSA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
5LLSB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
5LNA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
5LNB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6HEQA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
6HEQB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
6HNA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
6HNB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
6LCCA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LCCB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LEQA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LEQB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LLSA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LLSB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LNA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
6LNB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
7-1LNA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
7-1LNB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
7-1NLC	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)

ATS 7 Load Sid E/Z: 4.379 KA AT -81.23 DEG (31.55 MVA) X/R: 6.49
VOLTAGE: 4160. EQUIV. IMPEDANCE= 0.0836 + J 0.5421 OHMS
CONTRIBUTIONS: BUS-0342 4.379 KA ANG: -81.23

GENERATOR NAME	AT BUS	KA	VOLTS PU	LOCAL/REMOTE
UTILITY		4.314	0.75	R

TOTAL REMOTE: 4.314 KA NACD RATIO: 0.9853

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	4.379	4.379	4.379	4.379

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.099	1.000	1.000	1.000
DUTY (KA) :	4.814	4.379	4.379	4.379

BHCCA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHCCB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHEQA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHEQB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHLSA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHLSB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHNA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHNB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BLCCA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLCCB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLCCC	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLCCD	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLCCE	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQC	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQD	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)

T H R E E P H A S E I N T E R R U P U T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BLEQE	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQF	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQG	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQH	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQI	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQJ	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLLSA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLLSB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLLSC	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLLSD	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLLSE	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLLSF	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLLSG	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLNA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLNC	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLND	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLNE	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLNF	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)

BUS UTIL E/Z: 5.735 KA AT -78.77 DEG (123.87 MVA) X/R: 5.04
VOLTAGE: 12470. EQUIV. IMPEDANCE= 0.2444 + J 1.2314 OHMS
CBL-0300 BUS-0338 5.713 KA ANG: -258.77
XFMR UTIL 2 BUS-0004 0.022 KA ANG: 100.15

GENERATOR NAME --	AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
UTILITY		5.713	0.00	R

TOTAL REMOTE: 5.713 KA NACD RATIO: 0.9962

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

```
                                SYM2     SYM3     SYM5     SYM8
                MULT. FACT:    1.000    1.000    1.000    1.000
                DUTY (KA) :    5.735    5.735    5.735    5.735

                                TOT2     TOT3     TOT5     TOT8
                MULT. FACT:    1.054    1.000    1.000    1.000
                DUTY (KA) :    6.045    5.735    5.735    5.735

 CCSWBD         VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 DIST PNL R     VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 EMER RM 360    VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 EQSWBD         VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 EQUIP RM 372   VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 LSS 1          E/Z:      4.314 KA AT  -82.35 DEG (  31.08 MVA)  X/R:     7.44
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0742 + J  0.5518  OHMS
                CBL-0006        SWGR 1             4.314 KA      ANG:   -82.35

                GENERATOR NAME -- AT BUS --   KA    VOLTS PU  LOCAL/REMOTE
            UTILITY                          4.297     0.75         R
                TOTAL REMOTE:     4.297 KA  NACD RATIO:  0.9962

                                SYM2     SYM3     SYM5     SYM8
                MULT. FACT:    1.000    1.000    1.000    1.000
                DUTY (KA) :    4.314    4.314    4.314    4.314

                                TOT2     TOT3     TOT5     TOT8
                MULT. FACT:    1.130    1.014    1.000    1.000
                DUTY (KA) :    4.873    4.375    4.314    4.314

 LSS 2          E/Z:      4.375 KA AT  -82.30 DEG (  31.53 MVA)  X/R:     7.41
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0735 + J  0.5440  OHMS
                CONTRIBUTIONS:  SWGR 2             4.310 KA      ANG:   -82.34
                CBL-0015        MVS 2              0.066 KA      ANG:  -259.80

                GENERATOR NAME -- AT BUS --   KA    VOLTS PU  LOCAL/REMOTE
            UTILITY                          4.310     0.75         R
                TOTAL REMOTE:     4.310 KA  NACD RATIO:  0.9850
```

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

```
                              SYM2     SYM3     SYM5     SYM8
                 MULT. FACT:  1.000    1.000    1.000    1.000
                 DUTY (KA) :  4.375    4.375    4.375    4.375

                              TOT2     TOT3     TOT5     TOT8
                 MULT. FACT:  1.128    1.014    1.000    1.000
                 DUTY (KA) :  4.937    4.435    4.375    4.375

 LSSWBD          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 LVA-A           VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 LVA-B           VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 MP5C-1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 MP5C-2          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 MVS 1           E/Z:      4.375 KA AT  -82.30 DEG (  31.52 MVA)  X/R:     7.41
                 VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0736 + J  0.5440  OHMS
                 CBL-0009        LSS 2              4.375 KA      ANG:    97.70

                 GENERATOR NAME -- AT BUS --   KA    VOLTS PU  LOCAL/REMOTE
             UTILITY                          4.309     0.75         R
                 TOTAL REMOTE:     4.309 KA  NACD RATIO:  0.9850

                              SYM2     SYM3     SYM5     SYM8
                 MULT. FACT:  1.000    1.000    1.000    1.000
                 DUTY (KA) :  4.375    4.375    4.375    4.375

                              TOT2     TOT3     TOT5     TOT8
                 MULT. FACT:  1.128    1.014    1.000    1.000
                 DUTY (KA) :  4.937    4.435    4.375    4.375

 MVS 2           E/Z:      4.375 KA AT  -82.30 DEG (  31.52 MVA)  X/R:     7.41
                 VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0735 + J  0.5440  OHMS
                 CBL-0015        LSS 2              4.309 KA      ANG:   -82.34
                 T 1500 B        LVA-B              0.066 KA      ANG:   -79.80

                 GENERATOR NAME -- AT BUS --   KA    VOLTS PU  LOCAL/REMOTE
             UTILITY                          4.309     0.75         R
                 TOTAL REMOTE:     4.309 KA  NACD RATIO:  0.9850
```

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

		SYM2	SYM3	SYM5	SYM8
	MULT. FACT:	1.000	1.000	1.000	1.000
	DUTY (KA) :	4.375	4.375	4.375	4.375
		TOT2	TOT3	TOT5	TOT8
	MULT. FACT:	1.128	1.014	1.000	1.000
	DUTY (KA) :	4.937	4.435	4.375	4.375
PHEQA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)		
PLEQA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
PLNA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
PNL A	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
PNL B	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
PNL BIO MED	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
PNL L	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
PNL R	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
PNL UTIL SHOP	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
PNL UTIL SHOP	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
PNL UTIL SHOP	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
RP5L	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
RP6L	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
RP6R	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)		
SWGR 1	E/Z:	4.397 KA AT -82.81 DEG (31.68 MVA)		X/R:	7.93
	VOLTAGE:	4160.	EQUIV. IMPEDANCE= 0.0684 + J 0.5420		OHMS
	CONTRIBUTIONS:	BUS-0002	4.397 KA	ANG:	-82.81

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

```
                GENERATOR NAME -- AT BUS --   KA    VOLTS PU  LOCAL/REMOTE
            UTILITY                          4.380     0.75         R
                TOTAL REMOTE:     4.380 KA  NACD RATIO:  0.9962

                                  SYM2     SYM3     SYM5     SYM8
                MULT. FACT:      1.000    1.000    1.000    1.001
                DUTY (KA) :      4.397    4.397    4.397    4.400

                                  TOT2     TOT3     TOT5     TOT8
                MULT. FACT:      1.145    1.022    1.000    1.000
                DUTY (KA) :      5.034    4.492    4.397    4.397

 SWGR 2         E/Z:      4.458 KA AT  -82.76 DEG (  32.12 MVA)  X/R:     7.89
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0679 + J  0.5344  OHMS
                CONTRIBUTIONS:  LSS 2              0.066 KA      ANG:  -259.80
                CBL-0002        BUS-0004           4.392 KA      ANG:   -82.81

                GENERATOR NAME -- AT BUS --   KA    VOLTS PU  LOCAL/REMOTE
            UTILITY                          4.392     0.75         R
                TOTAL REMOTE:     4.392 KA  NACD RATIO:  0.9853

                                  SYM2     SYM3     SYM5     SYM8
                MULT. FACT:      1.000    1.000    1.000    1.001
                DUTY (KA) :      4.458    4.458    4.458    4.461

                                  TOT2     TOT3     TOT5     TOT8
                MULT. FACT:      1.144    1.021    1.000    1.000
                DUTY (KA) :      5.098    4.553    4.458    4.458

 SWGR PARALLEL  VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )
```

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	SLG	INTERRUPTING DUTIES (KA) 3 PHASE	SLG
ATS 7 Load Sid	3P Duty:	4.38	6.5	SYM2: 1.00		4.38	
VOLTS: 4160.0	SLG:			SYM3: 1.00		4.38	
NACD: 0.985	LN/LN:	3.79		SYM5: 1.00		4.38	
	LN/LN/GND:	3.79		SYM8: 1.00		4.38	
	GND RETURN:			TOT2: 1.10		4.81	
	Z1(PU):		3.16969	TOT3: 1.00		4.38	
	Z2(PU):		3.16969	TOT5: 1.00		4.38	
	Z0(PU):			TOT8: 1.00		4.38	
BUS UTIL	3P Duty:	5.73	5.0	SYM2: 1.00	1.00	5.73	0.72
VOLTS: 12470.0	SLG:	0.72	5.1	SYM3: 1.00	1.00	5.73	0.72
NACD: 0.996	LN/LN:	4.97		SYM5: 1.00	1.00	5.73	0.72
	LN/LN/GND:	4.97		SYM8: 1.00	1.00	5.73	0.72
	GND RETURN:	0.39		TOT2: 1.05	1.06	6.04	0.77
	Z1(PU):		0.80732	TOT3: 1.00	1.00	5.73	0.72
	Z2(PU):		0.80732	TOT5: 1.00	1.00	5.73	0.72
	Z0(PU):		17.54963	TOT8: 1.00	1.00	5.73	0.72
LSS 1	3P Duty:	4.31	7.4	SYM2: 1.00		4.31	
VOLTS: 4160.0	SLG:			SYM3: 1.00		4.31	
NACD: 0.996	LN/LN:	3.74		SYM5: 1.00		4.31	
	LN/LN/GND:	3.74		SYM8: 1.00		4.31	
	GND RETURN:			TOT2: 1.13		4.87	
	Z1(PU):		3.21728	TOT3: 1.01		4.37	
	Z2(PU):		3.21728	TOT5: 1.00		4.31	
	Z0(PU):			TOT8: 1.00		4.31	
LSS 2	3P Duty:	4.38	7.4	SYM2: 1.00		4.38	
VOLTS: 4160.0	SLG:			SYM3: 1.00		4.38	
NACD: 0.985	LN/LN:	3.79		SYM5: 1.00		4.38	
	LN/LN/GND:	3.79		SYM8: 1.00		4.38	
	GND RETURN:			TOT2: 1.13		4.94	
	Z1(PU):		3.17193	TOT3: 1.01		4.44	
	Z2(PU):		3.17193	TOT5: 1.00		4.38	
	Z0(PU):			TOT8: 1.00		4.38	

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	SLG	INTERRUPTING DUTIES (KA) 3 PHASE	SLG
MVS 1	3P Duty:	4.38	7.4	SYM2:	1.00	4.38	
VOLTS: 4160.0	SLG:			SYM3:	1.00	4.38	
NACD: 0.985	LN/LN:	3.79		SYM5:	1.00	4.38	
	LN/LN/GND:	3.79		SYM8:	1.00	4.38	
	GND RETURN:			TOT2:	1.13	4.94	
	Z1(PU):		3.17217	TOT3:	1.01	4.43	
	Z2(PU):		3.17217	TOT5:	1.00	4.38	
	Z0(PU):			TOT8:	1.00	4.38	
MVS 2	3P Duty:	4.38	7.4	SYM2:	1.00	4.38	
VOLTS: 4160.0	SLG:			SYM3:	1.00	4.38	
NACD: 0.985	LN/LN:	3.79		SYM5:	1.00	4.38	
	LN/LN/GND:	3.79		SYM8:	1.00	4.38	
	GND RETURN:			TOT2:	1.13	4.94	
	Z1(PU):		3.17216	TOT3:	1.01	4.43	
	Z2(PU):		3.17216	TOT5:	1.00	4.38	
	Z0(PU):			TOT8:	1.00	4.38	
SWGR 1	3P Duty:	4.40	7.9	SYM2:	1.00	4.40	
VOLTS: 4160.0	SLG:			SYM3:	1.00	4.40	
NACD: 0.996	LN/LN:	3.81		SYM5:	1.00	4.40	
	LN/LN/GND:	3.81		SYM8:	1.00	4.40	
	GND RETURN:			TOT2:	1.14	5.03	
	Z1(PU):		3.15657	TOT3:	1.02	4.49	
	Z2(PU):		3.15657	TOT5:	1.00	4.40	
	Z0(PU):			TOT8:	1.00	4.40	
SWGR 2	3P Duty:	4.46	7.9	SYM2:	1.00	4.46	
VOLTS: 4160.0	SLG:			SYM3:	1.00	4.46	
NACD: 0.985	LN/LN:	3.86		SYM5:	1.00	4.46	
	LN/LN/GND:	3.86		SYM8:	1.00	4.46	
	GND RETURN:			TOT2:	1.14	5.10	
	Z1(PU):		3.11304	TOT3:	1.02	4.55	
	Z2(PU):		3.11304	TOT5:	1.00	4.46	
	Z0(PU):			TOT8:	1.00	4.46	

I N T E R R U P T I N G D U T Y S U M M A R Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

BUS RECORD NO	NAME	VOLTAGE L-L	NACD RATIO	* 3 P H A S E * E/Z KA	X/R	* * * S L G * * * E/Z KA	X/R
	ATS 7 Load Sid	4160.	0.985	4.379	6.49		
	BUS UTIL	12470.	0.996	5.735	5.04	0.725	5.11
	LSS 1	4160.	0.996	4.314	7.44		
	LSS 2	4160.	0.985	4.375	7.41		
	MVS 1	4160.	0.985	4.375	7.41		
	MVS 2	4160.	0.985	4.375	7.41		
	SWGR 1	4160.	0.996	4.397	7.93		
	SWGR 2	4160.	0.985	4.458	7.89		

14 FAULTED BUSES, 335 BRANCHES, 8 CONTRIBUTIONS
UNBALANCED FAULTS REQUESTED

*** SHORT CIRCUIT STUDY COMPLETE ***

SHORT-CIRCUIT RESULTS – GENERATOR CONTRIBUTION

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VA Clarksburg
Generator Contribution

Nov 28, 2012     15:06:42B-76


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A_FAULT SHORT CIRCUIT ANALYSIS REPORT
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

```
 1 HNB          3P Duty:  9.537 KA AT  -80.21 DEG (   7.93 MVA)  X/R:     6.07
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0049 + J  0.0286  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.537 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  11.092 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.971 KA
                CBL-0178        BHNB               9.537 KA      ANG:   -80.21

 19-1LEQA       3P Duty:  2.515 KA AT  -67.96 DEG (   0.91 MVA)  X/R:     2.48
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0179 + J  0.0443  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.515 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.771 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.515 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.515 KA
                T-19-1 LEQA     T 19-1 LEQA        2.515 KA      ANG:   112.04

 19-1LNA        3P Duty:  2.554 KA AT  -70.05 DEG (   0.92 MVA)  X/R:     2.76
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0160 + J  0.0442  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.554 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.900 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.554 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.554 KA
                T-19-1 LNA      T 19-1 LNA         2.554 KA      ANG:   109.95

 1CA            3P Duty:  1.964 KA AT  -30.27 DEG (   0.71 MVA)  X/R:     0.58
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0528 + J  0.0308  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.964 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.964 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.964 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.964 KA
                CBL-0168        1LNA               1.964 KA      ANG:   -30.27

 1CB            3P Duty:  3.866 KA AT  -52.54 DEG (   1.39 MVA)  X/R:     1.31
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0189 + J  0.0247  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.866 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.866 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.866 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.866 KA
                CBL-0163        1LNA               3.866 KA      ANG:   -52.54

 1CC            3P Duty:  2.273 KA AT  -31.97 DEG (   0.82 MVA)  X/R:     0.62
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0448 + J  0.0280  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    2.273 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.273 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.273 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.273 KA
                CBL-0167        1LNA               2.273 KA      ANG:   -31.97

 1CD            3P Duty:  3.680 KA AT  -51.82 DEG (   1.33 MVA)  X/R:     1.27
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0202 + J  0.0257  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.680 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.680 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.680 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.680 KA
                CBL-0164        1CB                3.680 KA      ANG:   -51.82

 1HCCB          3P Duty:  9.458 KA AT  -79.80 DEG (   7.86 MVA)  X/R:     5.84
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0052 + J  0.0288  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.458 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  10.916 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.813 KA
                CBL-0231        BHCCB              9.458 KA      ANG:   -79.80

 1HLSB          3P Duty:  6.934 KA AT  -73.41 DEG (   5.76 MVA)  X/R:     3.42
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0114 + J  0.0383  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.934 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.344 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.071 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.934 KA
                CBL-0137        BHLSB              6.934 KA      ANG:   -73.41

 1LCCA          3P Duty:  6.738 KA AT  -71.65 DEG (   2.43 MVA)  X/R:     3.04
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0056 + J  0.0169  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.738 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.855 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.738 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.738 KA
                CBL-0197        BLCCA              6.738 KA      ANG:   -71.65

 1LCCB          3P Duty:  6.502 KA AT  -75.21 DEG (   2.34 MVA)  X/R:     3.82
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0047 + J  0.0179  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.502 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.049 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.822 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.502 KA
                CBL-0233        T-1 LCCB SEC       6.502 KA      ANG:   -75.21
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

CONTRIBUTIONS TO 1LCCB (CONTINUED)

1LCCC	3P Duty:	2.706 KA AT	-40.45 DEG (	0.97 MVA)	X/R: 0.85
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0338 + J 0.0288	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			2.706 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA			2.706 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA			2.706 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA			2.706 KA	
	CBL-0198	1LCCA		2.706 KA	ANG: -40.45
1LCCD	3P Duty:	3.832 KA AT	-58.79 DEG (	1.38 MVA)	X/R: 1.66
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0162 + J 0.0268	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			3.832 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA			3.832 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA			3.832 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA			3.832 KA	
	CBL-0236	1LCCB		3.832 KA	ANG: -58.79
1LCCE	3P Duty:	3.742 KA AT	-58.28 DEG (	1.35 MVA)	X/R: 1.62
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0169 + J 0.0273	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			3.742 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA			3.742 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA			3.742 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA			3.742 KA	
	CBL-0237	1LCCD		3.742 KA	ANG: -58.28
1LEQA	3P Duty:	6.657 KA AT	-70.85 DEG (	2.40 MVA)	X/R: 2.89
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0059 + J 0.0170	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			6.657 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA			7.652 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA			6.657 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA			6.657 KA	
	CBL-0083	BLEQA		6.657 KA	ANG: -70.85
1LEQB	3P Duty:	2.174 KA AT	-68.54 DEG (	0.78 MVA)	X/R: 2.55
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0202 + J 0.0514	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			2.174 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA			2.414 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA			2.174 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA			2.174 KA	
	CBL-0100	2LEQB		2.174 KA	ANG: -68.54
1LLSA	3P Duty:	3.885 KA AT	-60.77 DEG (	1.40 MVA)	X/R: 1.79
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0151 + J 0.0270	OHMS

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    3.885 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.919 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.885 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.885 KA
                CBL-0121        BLLSA              3.885 KA      ANG:   -60.77

 1LLSB          3P Duty:  3.668 KA AT  -72.08 DEG (   1.32 MVA)  X/R:     3.10
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0101 + J  0.0312  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.668 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.300 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.668 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.668 KA
                CBL-0135        T-1LLSB SEC        3.668 KA      ANG:   -72.08

 1LLSC          3P Duty:  2.208 KA AT  -41.57 DEG (   0.80 MVA)  X/R:     0.89
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0407 + J  0.0361  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.208 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.208 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.208 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.208 KA
                CBL-0125        1LLSA              2.208 KA      ANG:   -41.57

 1LLSD          3P Duty:  2.114 KA AT  -46.81 DEG (   0.76 MVA)  X/R:     1.07
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0389 + J  0.0414  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.114 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.114 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.114 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.114 KA
                CBL-0140        1LLSB              2.114 KA      ANG:   -46.81

 1LNA           3P Duty:  8.259 KA AT  -70.68 DEG (   2.98 MVA)  X/R:     2.87
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0048 + J  0.0137  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.259 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   9.475 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   8.259 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.259 KA
                CBL-0162        BLNA               8.259 KA      ANG:   -70.68

 1LNB           3P Duty:  6.622 KA AT  -75.70 DEG (   2.39 MVA)  X/R:     3.96
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0045 + J  0.0176  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.622 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.268 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.007 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.622 KA
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

CONTRIBUTIONS TO 1LNB (CONTINUED)
CBL-0177 T-1LNB SEC 6.622 KA ANG: -75.70

1LNC
3P Duty: 3.098 KA AT -44.76 DEG (1.12 MVA) X/R: 0.99
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0275 + J 0.0273 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 3.098 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 3.098 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 3.098 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 3.098 KA
CBL-0179 1LNB 3.098 KA ANG: -44.76

1WC
3P Duty: 3.594 KA AT -51.48 DEG (1.29 MVA) X/R: 1.26
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0208 + J 0.0261 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 3.594 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 3.594 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 3.594 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 3.594 KA
CBL-0165 1LNA 3.594 KA ANG: -51.48

2HEQA
3P Duty: 7.822 KA AT -75.62 DEG (6.50 MVA) X/R: 3.94
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0088 + J 0.0343 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 7.822 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 9.758 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 8.270 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 7.822 KA
CBL-0208 BHEQA 7.822 KA ANG: -75.62

2HEQB
3P Duty: 8.945 KA AT -78.49 DEG (7.44 MVA) X/R: 5.10
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0062 + J 0.0304 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 8.945 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 10.040 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 9.025 KA
CBL-0099 BHEQB 8.945 KA ANG: -78.49

2HNA
3P Duty: 7.689 KA AT -75.56 DEG (6.39 MVA) X/R: 3.94
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0090 + J 0.0349 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 7.689 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 9.592 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 8.129 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 7.689 KA
CBL-0205 BHNA 7.689 KA ANG: -75.56

2HNB
3P Duty: 9.213 KA AT -79.40 DEG (7.66 MVA) X/R: 5.58
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0055 + J 0.0296 OHMS

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    9.213 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  10.535 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.470 KA
                CBL-0183        BHNB              9.213 KA      ANG:   -79.40

 2LCCA          3P Duty:  6.524 KA AT  -71.01 DEG (   2.35 MVA)  X/R:     2.93
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0060 + J  0.0174  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.524 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.528 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.524 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.524 KA
                CBL-0201        1LCCA             6.524 KA      ANG:   -71.01

 2LCCB          3P Duty:  6.151 KA AT  -74.24 DEG (   2.22 MVA)  X/R:     3.57
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0053 + J  0.0188  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.151 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.484 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.343 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.151 KA
                CBL-0238        1LCCB             6.151 KA      ANG:   -74.24

 2LCCC          3P Duty:  3.619 KA AT  -55.51 DEG (   1.30 MVA)  X/R:     1.46
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0188 + J  0.0273  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.619 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.619 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.619 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.619 KA
                CBL-0202        2LCCA             3.619 KA      ANG:   -55.51

 2LCCD          3P Duty:  3.495 KA AT  -54.26 DEG (   1.26 MVA)  X/R:     1.39
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0201 + J  0.0279  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.495 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.495 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.495 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.495 KA
                CBL-0203        2LCCC             3.495 KA      ANG:   -54.26

 2LCCE          3P Duty:  3.301 KA AT  -47.66 DEG (   1.19 MVA)  X/R:     1.10
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0245 + J  0.0269  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.301 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.301 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.301 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.301 KA
                CBL-0240        2LCCB             3.301 KA      ANG:   -47.66
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

2LCCF	3P Duty:	3.301 KA AT	-47.66 DEG (	1.19 MVA)	X/R:	1.10
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0245 + J	0.0269	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			3.301 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA			3.301 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA			3.301 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA			3.301 KA		
	CBL-0241	2LCCB		3.301 KA	ANG:	-47.66
2LEQA	3P Duty:	6.282 KA AT	-70.10 DEG (	2.26 MVA)	X/R:	2.77
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0065 + J	0.0180	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			6.282 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA			7.139 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA			6.282 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA			6.282 KA		
	CBL-0084	1LEQA		6.282 KA	ANG:	-70.10
2LEQB	3P Duty:	2.252 KA AT	-70.68 DEG (	0.81 MVA)	X/R:	2.86
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0176 + J	0.0503	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			2.252 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA			2.581 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA			2.252 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA			2.252 KA		
	CBL-0098	T-2 LEQB SEC		2.252 KA	ANG:	-70.68
2LLSA	3P Duty:	3.705 KA AT	-59.66 DEG (	1.33 MVA)	X/R:	1.71
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0164 + J	0.0280	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			3.705 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA			3.705 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA			3.705 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA			3.705 KA		
	CBL-0123	1LLSA		3.705 KA	ANG:	-59.66
2LLSB	3P Duty:	3.439 KA AT	-67.65 DEG (	1.24 MVA)	X/R:	2.44
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0133 + J	0.0323	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			3.439 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA			3.773 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA			3.439 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA			3.439 KA		
	CBL-0141	1LLSB		3.439 KA	ANG:	-67.65
2LLSC	3P Duty:	1.925 KA AT	-39.14 DEG (	0.69 MVA)	X/R:	0.81
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0484 + J	0.0394	OHMS

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    1.925 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.925 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.925 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.925 KA
                CBL-0124        2LLSA              1.925 KA      ANG:   -39.14

 2LLSD          3P Duty:  2.317 KA AT  -51.20 DEG (   0.83 MVA)  X/R:     1.25
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0325 + J  0.0404  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.317 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.317 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.317 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.317 KA
                CBL-0142        2LLSB              2.317 KA      ANG:   -51.20

 2LNA           3P Duty:  7.937 KA AT  -69.95 DEG (   2.86 MVA)  X/R:     2.75
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0052 + J  0.0142  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.937 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   9.004 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.937 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.937 KA
                CBL-0166        1LNA               7.937 KA      ANG:   -69.95

 2LNB           3P Duty:  2.259 KA AT  -70.75 DEG (   0.81 MVA)  X/R:     2.87
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0175 + J  0.0502  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.259 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.593 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.259 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.259 KA
                CBL-0182        T-2LNB SEC         2.259 KA      ANG:   -70.75

 3A EM          3P Duty:  2.440 KA AT  -39.68 DEG (   0.88 MVA)  X/R:     0.83
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0379 + J  0.0314  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.440 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.440 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.440 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.440 KA
                CBL-0216        3LCCA              2.440 KA      ANG:   -39.68

 3A1            3P Duty:  3.666 KA AT  -65.95 DEG (   1.32 MVA)  X/R:     2.25
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0133 + J  0.0299  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.666 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.932 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.666 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.666 KA
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                CONTRIBUTIONS TO  3A1            (CONTINUED)
                CBL-0211        BLCCA             3.666 KA      ANG:   -65.95

 3HCCB          3P Duty:  8.655 KA AT  -74.72 DEG (   7.20 MVA)  X/R:     3.77
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0084 + J  0.0309  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.655 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   9.047 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.655 KA
                CBL-0242        BHCCB             8.655 KA      ANG:   -74.72

 3HLSB          3P Duty:  6.124 KA AT  -64.15 DEG (   5.09 MVA)  X/R:     2.09
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0197 + J  0.0407  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.124 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.434 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.124 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.124 KA
                CBL-0147        BHLSB             6.124 KA      ANG:   -64.15

 3HNB           3P Duty:  8.909 KA AT  -78.66 DEG (   7.41 MVA)  X/R:     5.18
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0061 + J  0.0305  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.909 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  10.030 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.016 KA
                CBL-0187        BHNB              8.909 KA      ANG:   -78.66

 3LCCA          3P Duty:  5.483 KA AT  -70.06 DEG (   1.98 MVA)  X/R:     2.77
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0075 + J  0.0206  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.483 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.233 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.483 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.483 KA
                CBL-0214        BLCCA             5.483 KA      ANG:   -70.06

 3LCCB          3P Duty:  3.843 KA AT  -72.26 DEG (   1.38 MVA)  X/R:     3.14
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0095 + J  0.0298  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.843 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.520 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.843 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.843 KA
                CBL-0244        T-3LCCB SEC       3.843 KA      ANG:   -72.26

 3LCCC          3P Duty:  3.928 KA AT  -60.30 DEG (   1.42 MVA)  X/R:     1.76
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0151 + J  0.0266  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    3.928 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.943 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.928 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.928 KA
                CBL-0215        3LCCA              3.928 KA      ANG:   -60.30

 3LEQA          3P Duty:  6.282 KA AT  -70.10 DEG (   2.26 MVA)  X/R:     2.77
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0065 + J  0.0180  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.282 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.139 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.282 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.282 KA
                CBL-0085        BLEQA              6.282 KA      ANG:   -70.10

 3LEQB          3P Duty:  2.162 KA AT  -68.48 DEG (   0.78 MVA)  X/R:     2.54
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0204 + J  0.0517  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.162 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.399 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.162 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.162 KA
                CBL-0104        4LEQB              2.162 KA      ANG:   -68.48

 3LLSA          3P Duty:  3.705 KA AT  -59.66 DEG (   1.33 MVA)  X/R:     1.71
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0164 + J  0.0280  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.705 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.705 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.705 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.705 KA
                CBL-0126        BLLSA              3.705 KA      ANG:   -59.66

 3LLSB          3P Duty:  1.956 KA AT  -67.35 DEG (   0.70 MVA)  X/R:     2.40
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0236 + J  0.0567  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.956 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.136 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.956 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.956 KA
                CBL-0146        T-3LLSB SEC        1.956 KA      ANG:   -67.35

 3LLSC          3P Duty:  1.877 KA AT  -38.63 DEG (   0.68 MVA)  X/R:     0.80
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0500 + J  0.0399  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.877 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.877 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.877 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.877 KA
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                CONTRIBUTIONS TO  3LLSC          (CONTINUED)
                CBL-0127        3LLSA              1.877 KA      ANG:   -38.63

 3LLSD          3P Duty:  1.487 KA AT  -53.85 DEG (   0.54 MVA)  X/R:     1.37
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0476 + J  0.0652  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.487 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.487 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.487 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.487 KA
                CBL-0148        3LLSB              1.487 KA      ANG:   -53.85

 3LNA           3P Duty:  6.233 KA AT  -68.78 DEG (   2.25 MVA)  X/R:     2.58
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0070 + J  0.0180  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.233 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.948 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.233 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.233 KA
                CBL-0169        BLNA               6.233 KA      ANG:   -68.78

 3LNB           3P Duty:  2.251 KA AT  -70.70 DEG (   0.81 MVA)  X/R:     2.86
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0176 + J  0.0504  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.251 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.581 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.251 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.251 KA
                CBL-0186        T-3LNB SEC         2.251 KA      ANG:   -70.70

 3LNC           3P Duty:  4.280 KA AT  -58.52 DEG (   1.54 MVA)  X/R:     1.64
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0147 + J  0.0239  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.280 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.280 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.280 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.280 KA
                CBL-0170        3LNA               4.280 KA      ANG:   -58.52

 4AD            3P Duty:  3.791 KA AT  -60.21 DEG (   1.37 MVA)  X/R:     1.75
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0157 + J  0.0275  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.791 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.802 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.791 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.791 KA
                CBL-0219        4C                 3.791 KA      ANG:   -60.21

 4C             3P Duty:  3.791 KA AT  -60.21 DEG (   1.37 MVA)  X/R:     1.75
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0157 + J  0.0275  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.791 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.802 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.791 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.791 KA
                CBL-0218        4LCCA             3.791 KA      ANG:   -60.21

 4DP            3P Duty:  3.437 KA AT  -65.43 DEG (   1.24 MVA)  X/R:     2.19
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0145 + J  0.0318  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.437 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.661 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.437 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.437 KA
                CBL-0220        BLCCA             3.437 KA      ANG:   -65.43

 4EML           3P Duty:  3.212 KA AT  -61.70 DEG (   1.16 MVA)  X/R:     1.86
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0177 + J  0.0329  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.212 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.273 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.212 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.212 KA
                CBL-0221        4DP               3.212 KA      ANG:   -61.70

 4HEQA          3P Duty:  7.597 KA AT  -75.09 DEG (   6.32 MVA)  X/R:     3.79
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0094 + J  0.0352  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.597 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   9.387 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.955 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.597 KA
                CBL-0209        BHEQA             7.597 KA      ANG:   -75.09

 4HEQB          3P Duty:  8.519 KA AT  -77.46 DEG (   7.08 MVA)  X/R:     4.65
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0071 + J  0.0318  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.519 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   9.365 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.519 KA
                CBL-0103        BHEQB             8.519 KA      ANG:   -77.46

 4HNA           3P Duty:  5.617 KA AT  -70.66 DEG (   4.67 MVA)  X/R:     2.87
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0163 + J  0.0466  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.617 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.448 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.617 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.617 KA
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                CONTRIBUTIONS TO  4HNA           (CONTINUED)
                CBL-0206        BHNA              5.617 KA      ANG:   -70.66

 4HNB           3P Duty:  8.623 KA AT  -77.96 DEG (   7.17 MVA)  X/R:     4.85
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0067 + J  0.0314  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.623 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   9.571 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.623 KA
                CBL-0190        BHNB              8.623 KA      ANG:   -77.96

 4L             3P Duty:  3.338 KA AT  -63.94 DEG (   1.20 MVA)  X/R:     2.05
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0158 + J  0.0323  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.338 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.490 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.338 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.338 KA
                CBL-0222        4DP               3.338 KA      ANG:   -63.94

 4LA            3P Duty:  3.323 KA AT  -63.50 DEG (   1.20 MVA)  X/R:     2.01
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0161 + J  0.0323  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.323 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.456 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.323 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.323 KA
                CBL-0223        4DP               3.323 KA      ANG:   -63.50

 4LCCA          3P Duty:  5.225 KA AT  -69.48 DEG (   1.88 MVA)  X/R:     2.69
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0081 + J  0.0215  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.225 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   5.888 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.225 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.225 KA
                CBL-0217        3LCCA             5.225 KA      ANG:   -69.48

 4LCCB          3P Duty:  3.626 KA AT  -68.61 DEG (   1.31 MVA)  X/R:     2.56
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0121 + J  0.0308  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.626 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.032 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.626 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.626 KA
                CBL-0246        3LCCB             3.626 KA      ANG:   -68.61

 4LEQA          3P Duty:  5.947 KA AT  -69.43 DEG (   2.14 MVA)  X/R:     2.67
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0071 + J  0.0189  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    5.947 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.691 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.947 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.947 KA
                CBL-0086        3LEQA              5.947 KA      ANG:   -69.43

 4LEQB          3P Duty:  2.239 KA AT  -70.60 DEG (   0.81 MVA)  X/R:     2.85
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0178 + J  0.0506  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.239 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.563 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.239 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.239 KA
                CBL-0102        T-4LEQB SEC        2.239 KA      ANG:   -70.60

 4LEQC          3P Duty:  3.849 KA AT  -57.65 DEG (   1.39 MVA)  X/R:     1.58
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0167 + J  0.0264  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.849 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.849 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.849 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.849 KA
                CBL-0087        4LEQA              3.849 KA      ANG:   -57.65

 4LLSA          3P Duty:  3.540 KA AT  -58.64 DEG (   1.28 MVA)  X/R:     1.64
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0177 + J  0.0290  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.540 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.540 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.540 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.540 KA
                CBL-0128        3LLSA              3.540 KA      ANG:   -58.64

 4LLSB          3P Duty:  1.884 KA AT  -65.09 DEG (   0.68 MVA)  X/R:     2.16
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0268 + J  0.0578  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.884 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.997 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.884 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.884 KA
                CBL-0149        3LLSB              1.884 KA      ANG:   -65.09

 4LLSC          3P Duty:  2.142 KA AT  -42.01 DEG (   0.77 MVA)  X/R:     0.90
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0417 + J  0.0375  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.142 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.142 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.142 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.142 KA
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                CONTRIBUTIONS TO  4LLSC          (CONTINUED)
                CBL-0129        4LLSA              2.142 KA      ANG:   -42.01

 4LLSD          3P Duty:  1.366 KA AT  -50.74 DEG (   0.49 MVA)  X/R:     1.22
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0556 + J  0.0681  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.366 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.366 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.366 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.366 KA
                CBL-0150        4LLSB             1.366 KA      ANG:   -50.74

 4LNA           3P Duty:  5.901 KA AT  -68.19 DEG (   2.13 MVA)  X/R:     2.51
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0076 + J  0.0189  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.901 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.523 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.901 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.901 KA
                CBL-0171        3LNA              5.901 KA      ANG:   -68.19

 4LNB           3P Duty:  2.242 KA AT  -70.65 DEG (   0.81 MVA)  X/R:     2.85
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0177 + J  0.0505  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.242 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.569 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.242 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.242 KA
                CBL-0189        T-4LNB SEC        2.242 KA      ANG:   -70.65

 4LNC           3P Duty:  3.159 KA AT  -45.25 DEG (   1.14 MVA)  X/R:     1.01
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0268 + J  0.0270  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.159 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.159 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.159 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.159 KA
                CBL-0172        4LNA              3.159 KA      ANG:   -45.25

 5HCCB          3P Duty:  7.994 KA AT  -71.50 DEG (   6.65 MVA)  X/R:     3.06
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0110 + J  0.0329  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.994 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   9.332 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.994 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.994 KA
                CBL-0247        BHCCB             7.994 KA      ANG:   -71.50

 5HLSB          3P Duty:  5.507 KA AT  -58.72 DEG (   4.58 MVA)  X/R:     1.66
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0261 + J  0.0430  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.507 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   5.507 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.507 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.507 KA
                CBL-0153        BHLSB              5.507 KA      ANG:   -58.72

 5HNB           3P Duty:  8.353 KA AT  -77.30 DEG (   6.94 MVA)  X/R:     4.58
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0073 + J  0.0324  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.353 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   9.152 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.353 KA
                CBL-0193        BHNB               8.353 KA      ANG:   -77.30

 5LCCA          3P Duty:  5.165 KA AT  -69.34 DEG (   1.86 MVA)  X/R:     2.67
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0082 + J  0.0218  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.165 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   5.808 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.165 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.165 KA
                CBL-0226        BLCCA              5.165 KA      ANG:   -69.34

 5LCCB          3P Duty:  3.785 KA AT  -71.63 DEG (   1.36 MVA)  X/R:     3.02
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0100 + J  0.0301  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.785 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.406 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.785 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.785 KA
                CBL-0249        T-5LCCB SEC        3.785 KA      ANG:   -71.63

 5LEQA          3P Duty:  5.869 KA AT  -69.27 DEG (   2.11 MVA)  X/R:     2.65
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0072 + J  0.0191  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.869 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.587 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.869 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.869 KA
                CBL-0088        BLEQA              5.869 KA      ANG:   -69.27

 5LEQB          3P Duty:  2.159 KA AT  -54.67 DEG (   0.78 MVA)  X/R:     1.41
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0322 + J  0.0454  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.159 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.159 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.159 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.159 KA
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

CONTRIBUTIONS TO 5LEQB (CONTINUED)
CBL-0109 6LEQB 2.159 KA ANG: -54.67

5LLSA 3P Duty: 3.540 KA AT -58.64 DEG (1.28 MVA) X/R: 1.64
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0177 + J 0.0290 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 3.540 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 3.540 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 3.540 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 3.540 KA
CBL-0130 BLLSA 3.540 KA ANG: -58.64

5LLSB 3P Duty: 1.929 KA AT -66.48 DEG (0.69 MVA) X/R: 2.30
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0248 + J 0.0571 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 1.929 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 2.082 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 1.929 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 1.929 KA
CBL-0152 T-5LLSB SEC 1.929 KA ANG: -66.48

5LNA 3P Duty: 5.824 KA AT -68.05 DEG (2.10 MVA) X/R: 2.49
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0077 + J 0.0191 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 5.824 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 6.424 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 5.824 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 5.824 KA
CBL-0173 BLNA 5.824 KA ANG: -68.05

5LNB 3P Duty: 2.234 KA AT -70.60 DEG (0.80 MVA) X/R: 2.85
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0179 + J 0.0507 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 2.234 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 2.558 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 2.234 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 2.234 KA
CBL-0192 T-5LNB SEC 2.234 KA ANG: -70.60

6HEQA 3P Duty: 7.332 KA AT -74.47 DEG (6.10 MVA) X/R: 3.63
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0101 + J 0.0364 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 7.332 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 8.960 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 7.593 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 7.332 KA
CBL-0210 BHEQA 7.332 KA ANG: -74.47

6HEQB 3P Duty: 8.006 KA AT -76.23 DEG (6.66 MVA) X/R: 4.20

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0082 + J  0.0336  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.006 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   8.594 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.006 KA
                CBL-0108        BHEQB              8.006 KA      ANG:   -76.23

 6HNA           3P Duty:  7.265 KA AT  -74.55 DEG (   6.04 MVA)  X/R:     3.67
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0102 + J  0.0368  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.265 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.898 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.541 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.265 KA
                CBL-0207        BHNA               7.265 KA      ANG:   -74.55

 6HNB           3P Duty:  8.099 KA AT  -76.68 DEG (   6.73 MVA)  X/R:     4.35
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0079 + J  0.0333  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.099 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   8.767 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.099 KA
                CBL-0196        BHNB               8.099 KA      ANG:   -76.68

 6LCCA          3P Duty:  4.935 KA AT  -68.82 DEG (   1.78 MVA)  X/R:     2.59
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0088 + J  0.0227  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.935 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   5.507 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.935 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.935 KA
                CBL-0227        5LCCA              4.935 KA      ANG:   -68.82

 6LCCB          3P Duty:  3.630 KA AT  -70.07 DEG (   1.31 MVA)  X/R:     2.77
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0113 + J  0.0311  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.630 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.124 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.630 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.630 KA
                CBL-0250        5LCCB              3.630 KA      ANG:   -70.07

 6LEQA          3P Duty:  5.574 KA AT  -68.69 DEG (   2.01 MVA)  X/R:     2.57
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0078 + J  0.0201  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.574 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.204 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.574 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.574 KA
                CBL-0089        5LEQA              5.574 KA      ANG:   -68.69
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

6LEQB	3P Duty:	2.229 KA AT	-55.83 DEG (	0.80 MVA)	X/R:	1.48
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0303 + J 0.0446		OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			2.229 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA			2.229 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA			2.229 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA			2.229 KA		
	CBL-0107	T-6LEQB SEC		2.229 KA	ANG:	-55.83
6LLSA	3P Duty:	3.388 KA AT	-57.71 DEG (	1.22 MVA)	X/R:	1.59
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0189 + J 0.0300		OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			3.388 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA			3.388 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA			3.388 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA			3.388 KA		
	CBL-0132	5LLSA		3.388 KA	ANG:	-57.71
6LLSB	3P Duty:	1.858 KA AT	-64.29 DEG (	0.67 MVA)	X/R:	2.08
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0280 + J 0.0582		OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			1.858 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA			1.950 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA			1.858 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA			1.858 KA		
	CBL-0154	5LLSB		1.858 KA	ANG:	-64.29
6LNA	3P Duty:	5.532 KA AT	-67.53 DEG (	1.99 MVA)	X/R:	2.42
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0083 + J 0.0201		OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			5.532 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA			6.059 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA			5.532 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA			5.532 KA		
	CBL-0174	5LNA		5.532 KA	ANG:	-67.53
6LNB	3P Duty:	2.225 KA AT	-70.55 DEG (	0.80 MVA)	X/R:	2.84
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0180 + J 0.0509		OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			2.225 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA			2.546 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA			2.225 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA			2.225 KA		
	CBL-0195	T-6LNB SEC		2.225 KA	ANG:	-70.55
7-1LNA	3P Duty:	10.291 KA AT	-76.66 DEG (	3.71 MVA)	X/R:	4.27
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0027 + J 0.0114		OHMS

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER   10.291 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  11.092 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  10.291 KA
                CBL-0303        BUS-0345          10.291 KA      ANG:   -76.66

 7-1LNB         3P Duty:  7.305 KA AT  -71.05 DEG (   2.63 MVA)  X/R:     2.93
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0053 + J  0.0155  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.305 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.431 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.305 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.305 KA
                CBL-0304        7-1LNA            7.305 KA      ANG:   -71.05

 7-1NLC         3P Duty:  5.499 KA AT  -67.72 DEG (   1.98 MVA)  X/R:     2.45
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0083 + J  0.0202  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.499 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.040 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.499 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.499 KA
                CBL-0305        7-1LNB            5.499 KA      ANG:   -67.72

 ATS 7 Load Sid 3P Duty:  1.875 KA AT  -85.51 DEG (  13.51 MVA)  X/R:    14.82
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.1003 + J  1.2772  OHMS
                ATS 7           BUS-0342          1.875 KA      ANG:   -85.51

 BHCCA          3P Duty:  9.455 KA AT  -79.56 DEG (   7.86 MVA)  X/R:     5.70
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0053 + J  0.0288  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.455 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  10.859 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.761 KA
                CBL-0036        CCSWBD            9.455 KA      ANG:   -79.56

 BHCCB          3P Duty:  9.799 KA AT  -80.64 DEG (   8.15 MVA)  X/R:     6.41
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0046 + J  0.0279  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.799 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  11.515 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  10.352 KA
                CBL-0045        CCSWBD            9.799 KA      ANG:   -80.64

 BHEQA          3P Duty:  9.658 KA AT  -80.01 DEG (   8.03 MVA)  X/R:     5.79
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0050 + J  0.0283  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    9.658 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  11.130 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  10.005 KA
                CBL-0090        PHEQA              0.871 KA      ANG:  -257.58
                CBL-0059        EQSWBD             8.788 KA      ANG:   -80.25

 BHEQB          3P Duty:  9.751 KA AT  -80.45 DEG (   8.11 MVA)  X/R:     6.26
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0047 + J  0.0280  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.751 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  11.406 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  10.254 KA
                CBL-0094        EQSWBD             9.751 KA      ANG:   -80.45

 BHLSA          3P Duty:  6.583 KA AT  -73.38 DEG (   5.47 MVA)  X/R:     3.41
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0120 + J  0.0403  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.583 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.915 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.708 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.583 KA
                CBL-0116        LSSWBD             6.583 KA      ANG:   -73.38

 BHLSB          3P Duty:  7.168 KA AT  -74.81 DEG (   5.96 MVA)  X/R:     3.77
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0101 + J  0.0373  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    7.168 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.840 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   7.492 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   7.168 KA
                CBL-0136        LSSWBD             7.168 KA      ANG:   -74.81

 BHNA           3P Duty:  9.798 KA AT  -80.69 DEG (   8.15 MVA)  X/R:     6.29
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0046 + J  0.0279  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.798 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  11.471 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  10.312 KA
                CBL-0155        T-BLNA PRI         0.595 KA      ANG:  -256.91
                CBL-0034        LVA-B              9.204 KA      ANG:   -80.93

 BHNB           3P Duty:  9.882 KA AT  -81.07 DEG (   8.22 MVA)  X/R:     6.72
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0044 + J  0.0277  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.915 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  11.711 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  10.527 KA
                CBL-0035        LVA-B              9.882 KA      ANG:   -81.07
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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BLCCA          3P Duty:  8.614 KA AT  -77.32 DEG (   3.10 MVA)  X/R:     4.51
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0031 + J  0.0136  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    8.614 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   9.407 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   8.614 KA
               CBL-0038        T-BLCCA SEC        8.614 KA      ANG:   -77.32

BLCCB          3P Duty:  8.705 KA AT  -77.60 DEG (   3.14 MVA)  X/R:     4.62
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0030 + J  0.0135  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    8.705 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   9.557 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   8.705 KA
               CBL-0047        T-BLCCB SEC        8.705 KA      ANG:   -77.60

BLCCC          3P Duty:  2.416 KA AT  -36.06 DEG (   0.87 MVA)  X/R:     0.73
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0402 + J  0.0293  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    2.416 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   2.416 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   2.416 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   2.416 KA
               CBL-0043        BLCCA              2.416 KA      ANG:   -36.06

BLCCD          3P Duty:  6.012 KA AT  -57.47 DEG (   2.17 MVA)  X/R:     1.57
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0107 + J  0.0168  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    6.012 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   6.012 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   6.012 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   6.012 KA
               CBL-0039        BLCCA              6.012 KA      ANG:   -57.47

BLCCE          3P Duty:  4.052 KA AT  -45.21 DEG (   1.46 MVA)  X/R:     1.01
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0209 + J  0.0210  OHMS
               LOW VOLTAGE POWER CIRCUIT BREAKER    4.052 KA
               MOLDED CASE CIRCUIT BREAKER < 10KA   4.052 KA
               MOLDED CASE CIRCUIT BREAKER < 20KA   4.052 KA
               MOLDED CASE CIRCUIT BREAKER > 20KA   4.052 KA
               CBL-0050        BLCCB              4.052 KA      ANG:   -45.21

BLEQA          3P Duty: 10.498 KA AT  -78.69 DEG (   3.78 MVA)  X/R:     5.04
               VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0022 + J  0.0112  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER   10.498 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  11.751 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  10.564 KA
                CBL-0061        T-BLEQA SEC       10.498 KA      ANG:   -78.69

 BLEQB          3P Duty:  3.934 KA AT  -73.21 DEG (   1.42 MVA)  X/R:     3.33
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0088 + J  0.0292  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.934 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.699 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.983 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.934 KA
                CBL-0096        T-BLEQB SEC       3.934 KA      ANG:   -73.21

 BLEQC          3P Duty:  2.860 KA AT  -54.51 DEG (   1.03 MVA)  X/R:     1.40
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0244 + J  0.0342  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.860 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.860 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.860 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.860 KA
                CBL-0118        BLLSA             2.860 KA      ANG:   -54.51

 BLEQD          3P Duty:  2.758 KA AT  -53.90 DEG (   0.99 MVA)  X/R:     1.37
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0257 + J  0.0352  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.758 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.758 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.758 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.758 KA
                CBL-0119        BLEQC             2.758 KA      ANG:   -53.90

 BLEQE          3P Duty:  6.372 KA AT  -70.28 DEG (   2.30 MVA)  X/R:     2.80
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0064 + J  0.0177  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.372 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   7.261 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.372 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.372 KA
                CBL-0066        BLEQA             6.372 KA      ANG:   -70.28

 BLEQF          3P Duty:  5.935 KA AT  -67.81 DEG (   2.14 MVA)  X/R:     2.46
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0076 + J  0.0187  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    5.935 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   6.525 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   5.935 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   5.935 KA
                CBL-0067        BLEQE             5.935 KA      ANG:   -67.81
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BLEQG	3P Duty:	5.526 KA AT	-57.97 DEG (	1.99 MVA)	X/R:	1.60
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0115 + J	0.0184	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER		5.526 KA			
	MOLDED CASE CIRCUIT BREAKER < 10KA		5.526 KA			
	MOLDED CASE CIRCUIT BREAKER < 20KA		5.526 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA		5.526 KA			
	CBL-0065	BLEQA	5.526 KA	ANG:	-57.97	
BLEQH	3P Duty:	7.113 KA AT	-64.14 DEG (	2.56 MVA)	X/R:	2.07
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0074 + J	0.0152	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER		7.113 KA			
	MOLDED CASE CIRCUIT BREAKER < 10KA		7.454 KA			
	MOLDED CASE CIRCUIT BREAKER < 20KA		7.113 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA		7.113 KA			
	CBL-0068	BLEQA	7.113 KA	ANG:	-64.14	
BLEQI	3P Duty:	6.544 KA AT	-61.90 DEG (	2.36 MVA)	X/R:	1.88
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0086 + J	0.0162	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER		6.544 KA			
	MOLDED CASE CIRCUIT BREAKER < 10KA		6.682 KA			
	MOLDED CASE CIRCUIT BREAKER < 20KA		6.544 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA		6.544 KA			
	CBL-0069	BLEQH	6.544 KA	ANG:	-61.90	
BLEQJ	3P Duty:	2.573 KA AT	-53.10 DEG (	0.93 MVA)	X/R:	1.33
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0280 + J	0.0373	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER		2.573 KA			
	MOLDED CASE CIRCUIT BREAKER < 10KA		2.573 KA			
	MOLDED CASE CIRCUIT BREAKER < 20KA		2.573 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA		2.573 KA			
	CBL-0110	BLEQB	2.573 KA	ANG:	-53.10	
BLLSA	3P Duty:	5.827 KA AT	-73.61 DEG (	2.10 MVA)	X/R:	3.43
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0058 + J	0.0198	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER		5.827 KA			
	MOLDED CASE CIRCUIT BREAKER < 10KA		7.013 KA			
	MOLDED CASE CIRCUIT BREAKER < 20KA		5.943 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA		5.827 KA			
	CBL-0113	T-BLLSA SEC	5.827 KA	ANG:	-73.61	
BLLSB	3P Duty:	3.439 KA AT	-67.65 DEG (	1.24 MVA)	X/R:	2.44
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0133 + J	0.0323	OHMS

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    3.439 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.773 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.439 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.439 KA
                CBL-0138        1LLSB             3.439 KA      ANG:   -67.65

 BLLSC          3P Duty:  1.841 KA AT  -34.42 DEG (   0.66 MVA)  X/R:     0.69
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0538 + J  0.0369  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.841 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.841 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.841 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.841 KA
                CBL-0120        BLLSA             1.841 KA      ANG:   -34.42

 BLLSD          3P Duty:  4.420 KA AT  -57.46 DEG (   1.59 MVA)  X/R:     1.57
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0146 + J  0.0229  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.420 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.420 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.420 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.420 KA
                CBL-0115        BLLSA             4.420 KA      ANG:   -57.46

 BLLSE          3P Duty:  3.444 KA AT  -57.12 DEG (   1.24 MVA)  X/R:     1.55
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0189 + J  0.0293  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.444 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.444 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.444 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.444 KA
                CBL-0117        BLLSF             3.444 KA      ANG:   -57.12

 BLLSF          3P Duty:  3.580 KA AT  -58.88 DEG (   1.29 MVA)  X/R:     1.66
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0173 + J  0.0287  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.580 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.580 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.580 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.580 KA
                CBL-0114        BLLSA             3.580 KA      ANG:   -58.88

 BLLSG          3P Duty:  2.232 KA AT  -48.46 DEG (   0.80 MVA)  X/R:     1.13
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0357 + J  0.0403  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.232 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.232 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.232 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.232 KA
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                CONTRIBUTIONS TO  BLLSG          (CONTINUED)
                CBL-0139        BLLSB             2.232 KA      ANG:   -48.46

 BLNA           3P Duty: 11.737 KA AT  -78.87 DEG (   4.23 MVA)  X/R:     5.15
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0020 + J  0.0100  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   11.737 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  13.198 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  11.864 KA
                CBL-0161        BUS-0180          1.476 KA      ANG:  -256.87
                CBL-0156        T-BLNA SEC       10.262 KA      ANG:   -79.16

 BLNC           3P Duty:  3.626 KA AT  -49.53 DEG (   1.31 MVA)  X/R:     1.17
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0215 + J  0.0252  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.626 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.626 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.626 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.626 KA
                CBL-0160        BLNA              3.626 KA      ANG:   -49.53

 BLND           3P Duty:  8.421 KA AT  -65.94 DEG (   3.03 MVA)  X/R:     2.25
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0058 + J  0.0130  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.421 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   9.031 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   8.421 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.421 KA
                CBL-0158        BLNA              8.421 KA      ANG:   -65.94

 BLNE           3P Duty:  4.989 KA AT  -54.04 DEG (   1.80 MVA)  X/R:     1.38
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0141 + J  0.0195  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.989 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.989 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.989 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.989 KA
                CBL-0159        BLNA              4.989 KA      ANG:   -54.04

 BLNF           3P Duty:  3.318 KA AT  -46.40 DEG (   1.20 MVA)  X/R:     1.05
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0250 + J  0.0262  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.318 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.318 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.318 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.318 KA
                CBL-0180        1LNB              3.318 KA      ANG:   -46.40

 CCSWBD         3P Duty: 10.969 KA AT  -84.38 DEG (   9.12 MVA)  X/R:    11.32
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0025 + J  0.0251  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   11.895 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  14.049 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  12.629 KA
                CBL-0020        ATS CC            10.969 KA      ANG:   -84.38

 DIST PNL R     3P Duty:  6.770 KA AT  -73.07 DEG (   2.44 MVA)  X/R:     3.31
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0052 + J  0.0170  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    6.770 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   8.076 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   6.845 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   6.770 KA
                CBL-0049        BLCCB              6.770 KA      ANG:   -73.07

 EMER RM 360    3P Duty:  2.527 KA AT  -52.82 DEG (   0.91 MVA)  X/R:     1.32
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0287 + J  0.0379  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.527 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.527 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.527 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.527 KA
                CBL-0245        3LCCB              2.527 KA      ANG:   -52.82

 EQSWBD         3P Duty: 10.997 KA AT  -84.43 DEG (   9.14 MVA)  X/R:    11.37
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0024 + J  0.0251  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   11.931 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  14.092 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  12.667 KA
                CBL-0025        ATS EQ            10.146 KA      ANG:   -85.04
                CBL-0059        BHEQA              0.859 KA      ANG:  -257.21

 EQUIP RM 372   3P Duty:  1.576 KA AT  -52.90 DEG (   0.57 MVA)  X/R:     1.32
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0460 + J  0.0608  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    1.576 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   1.576 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   1.576 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   1.576 KA
                CBL-0105        3LEQB              1.576 KA      ANG:   -52.90

 LSS 1          3P Duty:  1.871 KA AT  -85.95 DEG (  13.48 MVA)  X/R:    16.77
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0907 + J  1.2802  OHMS
                CBL-0006        SWGR 1             1.871 KA      ANG:   -85.95

 LSS 2          3P Duty:  1.875 KA AT  -85.99 DEG (  13.51 MVA)  X/R:    16.82
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0896 + J  1.2775  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                CONTRIBUTIONS TO  LSS 2          (CONTINUED)
                CBL-0009        MVS 1              0.096 KA      ANG:   -77.35
                CBL-0013        SWGR 2             1.714 KA      ANG:   -86.83
                CBL-0015        MVS 2              0.067 KA      ANG:  -256.82

 LSSWBD         3P Duty: 10.738 KA AT  -83.82 DEG (   8.93 MVA)  X/R:    10.07
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0028 + J  0.0257  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   11.474 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  13.552 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  12.182 KA
                CBL-0028        ATS LS            10.738 KA      ANG:   -83.82

 LVA-A          3P Duty: 11.142 KA AT  -84.84 DEG (   9.26 MVA)  X/R:    12.48
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0022 + J  0.0248  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   12.219 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  14.432 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  12.973 KA
                CBL-0024        BUS-0023           0.858 KA      ANG:  -257.18
                T 1500 A        MVS 1             10.293 KA      ANG:    94.53

 LVA-B          3P Duty: 11.038 KA AT  -84.80 DEG (   9.18 MVA)  X/R:    12.24
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0023 + J  0.0250  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   12.078 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  14.265 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  12.824 KA
                T 1500 B        MVS 2             10.454 KA      ANG:    94.75
                CBL-0034        BHNA               0.590 KA      ANG:  -256.70

 MP5C-1         3P Duty:  4.198 KA AT  -65.97 DEG (   1.51 MVA)  X/R:     2.25
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0117 + J  0.0261  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.198 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.500 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.198 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.198 KA
                CBL-0062        BLEQA              4.198 KA      ANG:   -65.97

 MP5C-2         3P Duty:  4.150 KA AT  -65.87 DEG (   1.50 MVA)  X/R:     2.24
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0118 + J  0.0264  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.150 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.444 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.150 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.150 KA
                CBL-0063        MP5C-1             4.150 KA      ANG:   -65.87
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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 MVS 1          3P Duty:  1.875 KA AT  -85.99 DEG (  13.51 MVA)  X/R:    16.81
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0897 + J  1.2775  OHMS
                T 1500 A        LVA-A              0.096 KA      ANG:  -257.35
                CBL-0009        LSS 2              1.780 KA      ANG:    93.55

 MVS 2          3P Duty:  1.875 KA AT  -85.99 DEG (  13.51 MVA)  X/R:    16.81
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0897 + J  1.2775  OHMS
                CBL-0015        LSS 2              1.809 KA      ANG:   -86.32
                T 1500 B        LVA-B              0.067 KA      ANG:   -76.82

 PHEQA          3P Duty:  8.407 KA AT  -76.19 DEG (   6.99 MVA)  X/R:     4.11
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0079 + J  0.0320  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.407 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   8.981 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.407 KA
                CBL-0091        T-PLEQA PRI        0.885 KA      ANG:   101.97
                CBL-0090        BHEQA              7.522 KA      ANG:   -75.97

 PLEQA          3P Duty:  8.162 KA AT  -76.64 DEG (   2.94 MVA)  X/R:     4.31
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0034 + J  0.0143  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    8.162 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   8.817 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   8.162 KA
                CBL-0294        BUS-0339           1.176 KA      ANG:    99.72
                CBL-0296        BUS-0340           0.793 KA      ANG:   101.86
                CBL-0298        BUS-0341           0.793 KA      ANG:   101.86
                CBL-0092        T-PLEQA SEC        5.405 KA      ANG:   -75.40

 PLNA           3P Duty:  4.547 KA AT  -52.57 DEG (   1.64 MVA)  X/R:     1.31
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0161 + J  0.0210  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    4.547 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   4.547 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   4.547 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   4.547 KA
                CBL-0175        BLNA               4.547 KA      ANG:   -52.57

 PNL A          3P Duty:  2.421 KA AT  -38.33 DEG (   0.87 MVA)  X/R:     0.79
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0389 + J  0.0308  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.421 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.421 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.421 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.421 KA
                CBL-0239        2LCCB              2.421 KA      ANG:   -38.33
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

PNL B	3P Duty:	6.116 KA AT	-60.06 DEG (	2.20 MVA)	X/R: 1.75
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0098 + J 0.0170	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			6.116 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA			6.131 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA			6.116 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA			6.116 KA	
	CBL-0093	PLEQA		6.116 KA	ANG: -60.06
PNL BIO MED	3P Duty:	1.713 KA AT	-40.12 DEG (	0.62 MVA)	X/R: 0.84
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0536 + J 0.0452	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			1.713 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA			1.713 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA			1.713 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA			1.713 KA	
	CBL-0111	BLEQB		1.713 KA	ANG: -40.12
PNL L	3P Duty:	2.558 KA AT	-38.55 DEG (	0.92 MVA)	X/R: 0.80
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0367 + J 0.0293	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			2.558 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA			2.558 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA			2.558 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA			2.558 KA	
	CBL-0235	1LCCB		2.558 KA	ANG: -38.55
PNL R	3P Duty:	2.558 KA AT	-38.55 DEG (	0.92 MVA)	X/R: 0.80
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0367 + J 0.0293	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			2.558 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA			2.558 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA			2.558 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA			2.558 KA	
	CBL-0234	1LCCB		2.558 KA	ANG: -38.55
PNL UTIL SHOP	3P Duty:	5.431 KA AT	-57.61 DEG (	1.96 MVA)	X/R: 1.58
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0118 + J 0.0187	OHMS
	LOW VOLTAGE POWER CIRCUIT BREAKER			5.431 KA	
	MOLDED CASE CIRCUIT BREAKER < 10KA			5.431 KA	
	MOLDED CASE CIRCUIT BREAKER < 20KA			5.431 KA	
	MOLDED CASE CIRCUIT BREAKER > 20KA			5.431 KA	
	CBL-0072	BLEQA		5.431 KA	ANG: -57.61
PNL UTIL SHOP	3P Duty:	3.553 KA AT	-50.62 DEG (	1.28 MVA)	X/R: 1.22
	VOLTAGE:	208.	EQUIV. IMPEDANCE=	0.0214 + J 0.0261	OHMS

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                LOW VOLTAGE POWER CIRCUIT BREAKER    3.553 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.553 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.553 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.553 KA
                CBL-0073        PNL UTIL SHOP      3.553 KA      ANG:   -50.62

 PNL UTIL SHOP  3P Duty:  3.320 KA AT  -49.77 DEG (   1.20 MVA)  X/R:     1.18
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0234 + J  0.0276  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    3.320 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   3.320 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   3.320 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   3.320 KA
                CBL-0074        PNL UTIL SHOP      3.320 KA      ANG:   -49.77

 RP5L           3P Duty:  2.454 KA AT  -40.87 DEG (   0.88 MVA)  X/R:     0.87
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0370 + J  0.0320  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.454 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.454 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.454 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.454 KA
                CBL-0229        5LCCA              2.454 KA      ANG:   -40.87

 RP6L           3P Duty:  2.259 KA AT  -39.88 DEG (   0.81 MVA)  X/R:     0.84
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0408 + J  0.0341  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.259 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.259 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.259 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.259 KA
                CBL-0228        6LCCA              2.259 KA      ANG:   -39.88

 RP6R           3P Duty:  2.541 KA AT  -53.78 DEG (   0.92 MVA)  X/R:     1.37
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0279 + J  0.0381  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    2.541 KA
                MOLDED CASE CIRCUIT BREAKER < 10KA   2.541 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA   2.541 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   2.541 KA
                CBL-0251        6LCCB              2.541 KA      ANG:   -53.78

 SWGR 1         3P Duty:  1.886 KA AT  -86.18 DEG (  13.59 MVA)  X/R:    18.02
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0849 + J  1.2703  OHMS
                CBL-0004        GENERATOR BUS      1.886 KA      ANG:    93.82

 SWGR 2         3P Duty:  1.888 KA AT  -86.19 DEG (  13.60 MVA)  X/R:    18.03
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0846 + J  1.2695  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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CONTRIBUTIONS TO SWGR 2 (CONTINUED)

CBL-0005	GENERATOR BUS	1.727 KA	ANG:	92.96
CBL-0013	LSS 2	0.163 KA	ANG:	-257.12

SWGR PARALLEL 3P Duty: 16.070 KA AT -86.93 DEG (13.36 MVA) X/R: 18.75
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0009 + J 0.0172 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 18.299 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 19.428 KA

CBL-0022	BUS GEN LV 1	7.965 KA	ANG:	93.04
CBL-0023	BUS GEN LV 2	7.965 KA	ANG:	93.04
CBL-0030	T 750 CAST PRI	0.141 KA	ANG:	-264.10

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
1 HNB	3P Duty:	9.537	6.	Z1= 12.6127	12.474	11.057
	SLG DUTY:	10.734	4.	Z2= 12.6127	12.748	
480. VOLTS	LN/LN:	8.259		Z0= 8.7215		
	LN/LN/GND:	11.121 (12.156 GND RETURN KA)				
19-1LEQA	3P Duty:	2.515	2.	Z1= 110.3526	2.707	2.612
	SLG DUTY:	2.624	3.	Z2= 110.3526	2.838	
208. VOLTS	LN/LN:	2.178		Z0= 96.6679		
	LN/LN/GND:	2.550 (2.742 GND RETURN KA)				
19-1LNA	3P Duty:	2.554	3.	Z1= 108.6718	2.805	2.681
	SLG DUTY:	2.652	3.	Z2= 108.6718	2.909	
208. VOLTS	LN/LN:	2.212		Z0= 96.6679		
	LN/LN/GND:	2.609 (2.757 GND RETURN KA)				
1CA	3P Duty:	1.964	1.	Z1= 141.3328	1.964	1.964
	SLG DUTY:	1.232	0.	Z2= 141.3328	1.232	
208. VOLTS	LN/LN:	1.701		Z0= 396.1372		
	LN/LN/GND:	1.826 (0.894 GND RETURN KA)				
1CB	3P Duty:	3.866	1.	Z1= 71.7924	3.898	3.882
	SLG DUTY:	2.773	1.	Z2= 71.7924	2.777	
208. VOLTS	LN/LN:	3.348		Z0= 159.3578		
	LN/LN/GND:	3.727 (2.143 GND RETURN KA)				
1CC	3P Duty:	2.273	1.	Z1= 122.0962	2.273	2.273
	SLG DUTY:	1.443	0.	Z2= 122.0962	1.443	
208. VOLTS	LN/LN:	1.969		Z0= 335.8205		
	LN/LN/GND:	2.124 (1.052 GND RETURN KA)				
1CD	3P Duty:	3.680	1.	Z1= 75.4215	3.707	3.693
	SLG DUTY:	2.615	1.	Z2= 75.4215	2.619	
208. VOLTS	LN/LN:	3.187		Z0= 170.2038		
	LN/LN/GND:	3.537 (2.012 GND RETURN KA)				
1HCCB	3P Duty:	9.458	6.	Z1= 12.7171	12.266	10.910
	SLG DUTY:	10.478	4.	Z2= 12.7171	12.316	
480. VOLTS	LN/LN:	8.191		Z0= 9.3530		
	LN/LN/GND:	10.908 (11.627 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
1HLSB	3P Duty:	6.934	3.	Z1= 17.3463	7.964	7.458
	SLG DUTY:	6.429	2.	Z2= 17.3463	6.817	
480. VOLTS	LN/LN:	6.005		Z0= 22.1895		
	LN/LN/GND:	7.297 (5.912 GND RETURN KA)				
1LCCA	3P Duty:	6.738	3.	Z1= 41.1928	7.543	7.146
	SLG DUTY:	6.585	2.	Z2= 41.1928	7.025	
208. VOLTS	LN/LN:	5.836		Z0= 44.8869		
	LN/LN/GND:	7.094 (6.397 GND RETURN KA)				
1LCCB	3P Duty:	6.502	4.	Z1= 42.6885	7.657	7.092
	SLG DUTY:	7.101	4.	Z2= 42.6885	8.209	
208. VOLTS	LN/LN:	5.631		Z0= 31.9543		
	LN/LN/GND:	6.994 (7.817 GND RETURN KA)				
1LCCC	3P Duty:	2.706	1.	Z1= 102.5811	2.708	2.707
	SLG DUTY:	1.838	1.	Z2= 102.5811	1.838	
208. VOLTS	LN/LN:	2.343		Z0= 252.0880		
	LN/LN/GND:	2.588 (1.380 GND RETURN KA)				
1LCCD	3P Duty:	3.832	2.	Z1= 72.4311	3.917	3.875
	SLG DUTY:	3.131	1.	Z2= 72.4311	3.149	
208. VOLTS	LN/LN:	3.319		Z0= 124.4160		
	LN/LN/GND:	3.851 (2.615 GND RETURN KA)				
1LCCE	3P Duty:	3.742	2.	Z1= 74.1831	3.819	3.780
	SLG DUTY:	3.031	1.	Z2= 74.1831	3.046	
208. VOLTS	LN/LN:	3.240		Z0= 129.7984		
	LN/LN/GND:	3.749 (2.516 GND RETURN KA)				
1LEQA	3P Duty:	6.657	3.	Z1= 41.6981	7.374	7.020
	SLG DUTY:	6.026	2.	Z2= 41.6981	6.361	
208. VOLTS	LN/LN:	5.765		Z0= 55.7049		
	LN/LN/GND:	6.786 (5.468 GND RETURN KA)				
1LEQB	3P Duty:	2.174	3.	Z1= 127.6846	2.351	2.264
	SLG DUTY:	2.184	2.	Z2= 127.6846	2.315	
208. VOLTS	LN/LN:	1.883		Z0= 126.5981		
	LN/LN/GND:	2.258 (2.190 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
1LLSA	3P Duty:	3.885	2.	Z1= 71.4507	4.000	3.942
	SLG DUTY:	3.420	1.	Z2= 71.4507	3.450	
208. VOLTS	LN/LN:	3.364		Z0= 103.6765		
	LN/LN/GND:	4.000 (3.016 GND RETURN KA)				
1LLSB	3P Duty:	3.668	3.	Z1= 75.6778	4.124	3.899
	SLG DUTY:	3.937	3.	Z2= 75.6778	4.404	
208. VOLTS	LN/LN:	3.176		Z0= 60.1885		
	LN/LN/GND:	3.846 (4.248 GND RETURN KA)				
1LLSC	3P Duty:	2.208	1.	Z1= 125.7314	2.210	2.209
	SLG DUTY:	1.555	1.	Z2= 125.7314	1.555	
208. VOLTS	LN/LN:	1.912		Z0= 289.8839		
	LN/LN/GND:	2.133 (1.188 GND RETURN KA)				
1LLSD	3P Duty:	2.114	1.	Z1= 131.2894	2.120	2.117
	SLG DUTY:	1.628	1.	Z2= 131.2894	1.628	
208. VOLTS	LN/LN:	1.831		Z0= 256.9106		
	LN/LN/GND:	2.107 (1.304 GND RETURN KA)				
1LNA	3P Duty:	8.259	3.	Z1= 33.6089	9.135	8.703
	SLG DUTY:	7.676	2.	Z2= 33.6089	8.070	
208. VOLTS	LN/LN:	7.152		Z0= 42.1740		
	LN/LN/GND:	8.565 (7.110 GND RETURN KA)				
1LNB	3P Duty:	6.622	4.	Z1= 41.9183	7.860	7.255
	SLG DUTY:	7.304	4.	Z2= 41.9183	8.550	
208. VOLTS	LN/LN:	5.735		Z0= 30.1970		
	LN/LN/GND:	7.137 (8.142 GND RETURN KA)				
1LNC	3P Duty:	3.098	1.	Z1= 89.5890	3.104	3.101
	SLG DUTY:	2.252	1.	Z2= 89.5890	2.253	
208. VOLTS	LN/LN:	2.683		Z0= 195.8404		
	LN/LN/GND:	3.039 (1.745 GND RETURN KA)				
1WC	3P Duty:	3.594	1.	Z1= 77.2403	3.618	3.606
	SLG DUTY:	2.543	1.	Z2= 77.2403	2.547	
208. VOLTS	LN/LN:	3.112		Z0= 175.6296		
	LN/LN/GND:	3.449 (1.953 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
2HEQA	3P Duty:	7.822	4.	Z1= 15.3764	9.277	8.566
	SLG DUTY:	7.512	3.	Z2= 15.3764	8.118	
480. VOLTS	LN/LN:	6.774		Z0= 17.9524		
	LN/LN/GND:	8.373 (7.125 GND RETURN KA)				
2HEQB	3P Duty:	8.945	5.	Z1= 13.4465	11.257	10.136
	SLG DUTY:	9.506	3.	Z2= 13.4465	10.818	
480. VOLTS	LN/LN:	7.747		Z0= 11.5145		
	LN/LN/GND:	10.071 (10.023 GND RETURN KA)				
2HNA	3P Duty:	7.689	4.	Z1= 15.6425	9.119	8.420
	SLG DUTY:	7.441	3.	Z2= 15.6425	8.051	
480. VOLTS	LN/LN:	6.659		Z0= 17.8673		
	LN/LN/GND:	8.253 (7.110 GND RETURN KA)				
2HNB	3P Duty:	9.213	6.	Z1= 13.0560	11.827	10.563
	SLG DUTY:	10.107	4.	Z2= 13.0560	11.747	
480. VOLTS	LN/LN:	7.978		Z0= 9.9812		
	LN/LN/GND:	10.574 (11.072 GND RETURN KA)				
2LCCA	3P Duty:	6.524	3.	Z1= 42.5477	7.247	6.890
	SLG DUTY:	6.266	2.	Z2= 42.5477	6.638	
208. VOLTS	LN/LN:	5.650		Z0= 48.7220		
	LN/LN/GND:	6.825 (5.986 GND RETURN KA)				
2LCCB	3P Duty:	6.151	4.	Z1= 45.1248	7.133	6.651
	SLG DUTY:	6.480	3.	Z2= 45.1248	7.303	
208. VOLTS	LN/LN:	5.327		Z0= 38.4314		
	LN/LN/GND:	6.538 (6.837 GND RETURN KA)				
2LCCC	3P Duty:	3.619	1.	Z1= 76.6896	3.668	3.644
	SLG DUTY:	2.733	1.	Z2= 76.6896	2.742	
208. VOLTS	LN/LN:	3.135		Z0= 154.3918		
	LN/LN/GND:	3.543 (2.174 GND RETURN KA)				
2LCCD	3P Duty:	3.495	1.	Z1= 79.4126	3.533	3.514
	SLG DUTY:	2.609	1.	Z2= 79.4126	2.615	
208. VOLTS	LN/LN:	3.027		Z0= 163.5997		
	LN/LN/GND:	3.413 (2.061 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
2LCCE	3P Duty:	3.301	1.	Z1= 84.0862	3.312	3.306
	SLG DUTY:	2.465	1.	Z2= 84.0862	2.466	
208. VOLTS	LN/LN:	2.859		Z0= 174.7605		
	LN/LN/GND:	3.262 (	1.938 GND RETURN KA)			
2LCCF	3P Duty:	3.301	1.	Z1= 84.0862	3.312	3.306
	SLG DUTY:	2.465	1.	Z2= 84.0862	2.466	
208. VOLTS	LN/LN:	2.859		Z0= 174.7605		
	LN/LN/GND:	3.262 (	1.938 GND RETURN KA)			
2LEQA	3P Duty:	6.282	3.	Z1= 44.1827	6.902	6.596
	SLG DUTY:	5.557	2.	Z2= 44.1827	5.832	
208. VOLTS	LN/LN:	5.441		Z0= 62.4819		
	LN/LN/GND:	6.351 (	4.949 GND RETURN KA)			
2LEQB	3P Duty:	2.252	3.	Z1= 123.2823	2.489	2.372
	SLG DUTY:	2.316	3.	Z2= 123.2823	2.537	
208. VOLTS	LN/LN:	1.950		Z0= 113.0057		
	LN/LN/GND:	2.317 (	2.385 GND RETURN KA)			
2LLSA	3P Duty:	3.705	2.	Z1= 74.9146	3.798	3.752
	SLG DUTY:	3.192	1.	Z2= 74.9146	3.214	
208. VOLTS	LN/LN:	3.209		Z0= 114.3985		
	LN/LN/GND:	3.787 (	2.768 GND RETURN KA)			
2LLSB	3P Duty:	3.439	2.	Z1= 80.7018	3.692	3.567
	SLG DUTY:	3.515	2.	Z2= 80.7018	3.672	
208. VOLTS	LN/LN:	2.979		Z0= 76.6235		
	LN/LN/GND:	3.677 (	3.577 GND RETURN KA)			
2LLSC	3P Duty:	1.925	1.	Z1= 144.1629	1.926	1.926
	SLG DUTY:	1.319	1.	Z2= 144.1629	1.319	
208. VOLTS	LN/LN:	1.667		Z0= 348.5384		
	LN/LN/GND:	1.842 (	0.995 GND RETURN KA)			
2LLSD	3P Duty:	2.317	1.	Z1= 119.7973	2.332	2.324
	SLG DUTY:	1.868	1.	Z2= 119.7973	1.870	
208. VOLTS	LN/LN:	2.007		Z0= 213.2296		
	LN/LN/GND:	2.338 (	1.541 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
2LNA	3P Duty:	7.937	3.	Z1= 34.9718	8.709	8.328
	SLG DUTY:	7.241	2.	Z2= 34.9718	7.569	
208. VOLTS	LN/LN:	6.874		Z0= 46.0407		
	LN/LN/GND:	8.176 (6.601 GND RETURN KA)				
2LNB	3P Duty:	2.259	3.	Z1= 122.8655	2.499	2.381
	SLG DUTY:	2.322	3.	Z2= 122.8655	2.544	
208. VOLTS	LN/LN:	1.956		Z0= 113.0057		
	LN/LN/GND:	2.324 (2.388 GND RETURN KA)				
3A EM	3P Duty:	2.440	1.	Z1= 113.7377	2.442	2.441
	SLG DUTY:	1.637	1.	Z2= 113.7377	1.637	
208. VOLTS	LN/LN:	2.113		Z0= 285.4247		
	LN/LN/GND:	2.321 (1.222 GND RETURN KA)				
3A1	3P Duty:	3.666	2.	Z1= 75.7093	3.884	3.776
	SLG DUTY:	2.895	2.	Z2= 75.7093	2.976	
208. VOLTS	LN/LN:	3.175		Z0= 137.6968		
	LN/LN/GND:	3.561 (2.380 GND RETURN KA)				
3HCCB	3P Duty:	8.655	4.	Z1= 13.8974	10.158	9.422
	SLG DUTY:	8.886	2.	Z2= 13.8974	9.459	
480. VOLTS	LN/LN:	7.495		Z0= 13.7070		
	LN/LN/GND:	9.774 (8.928 GND RETURN KA)				
3HLSB	3P Duty:	6.124	2.	Z1= 19.6422	6.418	6.272
	SLG DUTY:	5.181	1.	Z2= 19.6422	5.231	
480. VOLTS	LN/LN:	5.303		Z0= 31.8847		
	LN/LN/GND:	6.346 (4.394 GND RETURN KA)				
3HNB	3P Duty:	8.909	5.	Z1= 13.5017	11.248	10.114
	SLG DUTY:	9.545	3.	Z2= 13.5017	10.902	
480. VOLTS	LN/LN:	7.715		Z0= 11.2455		
	LN/LN/GND:	10.082 (10.159 GND RETURN KA)				
3LCCA	3P Duty:	5.483	3.	Z1= 50.6287	6.025	5.757
	SLG DUTY:	4.896	2.	Z2= 50.6287	5.154	
208. VOLTS	LN/LN:	4.748		Z0= 69.7822		
	LN/LN/GND:	5.538 (4.398 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
3LCCB	3P Duty:	3.843	3.	Z1= 72.2193	4.332	4.092
	SLG DUTY:	4.070	3.	Z2= 72.2193	4.560	
208. VOLTS	LN/LN:	3.329		Z0= 60.1885		
	LN/LN/GND:	3.999 (	4.324 GND RETURN KA)			
3LCCC	3P Duty:	3.928	2.	Z1= 70.6650	4.037	3.982
	SLG DUTY:	3.078	1.	Z2= 70.6650	3.105	
208. VOLTS	LN/LN:	3.402		Z0= 131.6329		
	LN/LN/GND:	3.865 (	2.509 GND RETURN KA)			
3LEQA	3P Duty:	6.282	3.	Z1= 44.1827	6.902	6.596
	SLG DUTY:	5.557	2.	Z2= 44.1827	5.832	
208. VOLTS	LN/LN:	5.441		Z0= 62.4819		
	LN/LN/GND:	6.351 (	4.949 GND RETURN KA)			
3LEQB	3P Duty:	2.162	3.	Z1= 128.3895	2.337	2.250
	SLG DUTY:	2.176	2.	Z2= 128.3895	2.306	
208. VOLTS	LN/LN:	1.872		Z0= 126.5981		
	LN/LN/GND:	2.247 (	2.186 GND RETURN KA)			
3LLSA	3P Duty:	3.705	2.	Z1= 74.9146	3.798	3.752
	SLG DUTY:	3.192	1.	Z2= 74.9146	3.214	
208. VOLTS	LN/LN:	3.209		Z0= 114.3985		
	LN/LN/GND:	3.787 (	2.768 GND RETURN KA)			
3LLSB	3P Duty:	1.956	2.	Z1= 141.9297	2.094	2.025
	SLG DUTY:	2.030	2.	Z2= 141.9297	2.162	
208. VOLTS	LN/LN:	1.694		Z0= 126.4428		
	LN/LN/GND:	2.015 (	2.109 GND RETURN KA)			
3LLSC	3P Duty:	1.877	1.	Z1= 147.8686	1.878	1.878
	SLG DUTY:	1.280	1.	Z2= 147.8686	1.280	
208. VOLTS	LN/LN:	1.626		Z0= 360.5157		
	LN/LN/GND:	1.793 (	0.963 GND RETURN KA)			
3LLSD	3P Duty:	1.487	1.	Z1= 186.6882	1.502	1.494
	SLG DUTY:	1.290	1.	Z2= 186.6882	1.293	
208. VOLTS	LN/LN:	1.288		Z0= 280.1864		
	LN/LN/GND:	1.522 (	1.125 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
3LNA	3P Duty:	6.233	3.	Z1= 44.5347	6.759	6.498
	SLG DUTY:	5.235	2.	Z2= 44.5347	5.449	
208. VOLTS	LN/LN:	5.398		Z0= 70.9634		
	LN/LN/GND:	6.183 (	4.486 GND RETURN KA)			
3LNB	3P Duty:	2.251	3.	Z1= 123.3316	2.489	2.371
	SLG DUTY:	2.316	3.	Z2= 123.3316	2.536	
208. VOLTS	LN/LN:	1.949		Z0= 113.0057		
	LN/LN/GND:	2.317 (	2.384 GND RETURN KA)			
3LNC	3P Duty:	4.280	2.	Z1= 64.8481	4.371	4.326
	SLG DUTY:	3.192	1.	Z2= 64.8481	3.213	
208. VOLTS	LN/LN:	3.707		Z0= 133.2177		
	LN/LN/GND:	4.148 (	2.526 GND RETURN KA)			
4AD	3P Duty:	3.791	2.	Z1= 73.2100	3.895	3.843
	SLG DUTY:	2.949	1.	Z2= 73.2100	2.974	
208. VOLTS	LN/LN:	3.283		Z0= 138.4103		
	LN/LN/GND:	3.719 (	2.392 GND RETURN KA)			
4C	3P Duty:	3.791	2.	Z1= 73.2097	3.895	3.843
	SLG DUTY:	2.949	1.	Z2= 73.2097	2.974	
208. VOLTS	LN/LN:	3.284		Z0= 138.4100		
	LN/LN/GND:	3.719 (	2.392 GND RETURN KA)			
4DP	3P Duty:	3.437	2.	Z1= 80.7547	3.628	3.533
	SLG DUTY:	2.675	2.	Z2= 80.7547	2.745	
208. VOLTS	LN/LN:	2.977		Z0= 151.3048		
	LN/LN/GND:	3.325 (	2.179 GND RETURN KA)			
4EML	3P Duty:	3.212	2.	Z1= 86.4100	3.320	3.267
	SLG DUTY:	2.438	1.	Z2= 86.4100	2.470	
208. VOLTS	LN/LN:	2.782		Z0= 170.8820		
	LN/LN/GND:	3.105 (	1.952 GND RETURN KA)			
4HEQA	3P Duty:	7.597	4.	Z1= 15.8323	8.931	8.278
	SLG DUTY:	7.188	2.	Z2= 15.8323	7.724	
480. VOLTS	LN/LN:	6.579		Z0= 19.2278		
	LN/LN/GND:	8.074 (	6.727 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
4HEQB	3P Duty:	8.519	5.	Z1= 14.1197	10.494	9.533
	SLG DUTY:	8.771	3.	Z2= 14.1197	9.787	
480. VOLTS	LN/LN:	7.377		Z0= 13.4169		
	LN/LN/GND:	9.422 (8.925 GND RETURN KA)				
4HNA	3P Duty:	5.617	3.	Z1= 21.4129	6.216	5.920
	SLG DUTY:	4.759	2.	Z2= 21.4129	4.955	
480. VOLTS	LN/LN:	4.865		Z0= 33.8310		
	LN/LN/GND:	5.681 (4.084 GND RETURN KA)				
4HNB	3P Duty:	8.623	5.	Z1= 13.9496	10.727	9.705
	SLG DUTY:	9.039	3.	Z2= 13.9496	10.178	
480. VOLTS	LN/LN:	7.467		Z0= 12.5129		
	LN/LN/GND:	9.636 (9.381 GND RETURN KA)				
4L	3P Duty:	3.338	2.	Z1= 83.1483	3.491	3.415
	SLG DUTY:	2.571	2.	Z2= 83.1483	2.622	
208. VOLTS	LN/LN:	2.891		Z0= 159.3602		
	LN/LN/GND:	3.228 (2.079 GND RETURN KA)				
4LA	3P Duty:	3.323	2.	Z1= 83.5380	3.466	3.395
	SLG DUTY:	2.553	2.	Z2= 83.5380	2.600	
208. VOLTS	LN/LN:	2.878		Z0= 160.9365		
	LN/LN/GND:	3.214 (2.061 GND RETURN KA)				
4LCCA	3P Duty:	5.225	3.	Z1= 53.1200	5.707	5.469
	SLG DUTY:	4.581	2.	Z2= 53.1200	4.801	
208. VOLTS	LN/LN:	4.525		Z0= 76.5552		
	LN/LN/GND:	5.246 (4.056 GND RETURN KA)				
4LCCB	3P Duty:	3.626	3.	Z1= 76.5551	3.926	3.777
	SLG DUTY:	3.682	2.	Z2= 76.5551	3.884	
208. VOLTS	LN/LN:	3.140		Z0= 73.8058		
	LN/LN/GND:	3.832 (3.728 GND RETURN KA)				
4LEQA	3P Duty:	5.947	3.	Z1= 46.6741	6.488	6.221
	SLG DUTY:	5.154	2.	Z2= 46.6741	5.384	
208. VOLTS	LN/LN:	5.150		Z0= 69.2663		
	LN/LN/GND:	5.969 (4.519 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
4LEQB	3P Duty:	2.239	3.	Z1= 123.9817	2.473	2.357
	SLG DUTY:	2.307	3.	Z2= 123.9817	2.526	
208. VOLTS	LN/LN:	1.939		Z0= 113.0057		
	LN/LN/GND:	2.305 (	2.380 GND RETURN KA)			
4LEQC	3P Duty:	3.849	2.	Z1= 72.1215	3.920	3.885
	SLG DUTY:	2.879	1.	Z2= 72.1215	2.894	
208. VOLTS	LN/LN:	3.333		Z0= 147.5223		
	LN/LN/GND:	3.741 (	2.280 GND RETURN KA)			
4LLSA	3P Duty:	3.540	2.	Z1= 78.4044	3.617	3.579
	SLG DUTY:	2.991	1.	Z2= 78.4044	3.008	
208. VOLTS	LN/LN:	3.066		Z0= 125.1525		
	LN/LN/GND:	3.594 (	2.557 GND RETURN KA)			
4LLSB	3P Duty:	1.884	2.	Z1= 147.3243	1.984	1.934
	SLG DUTY:	1.905	2.	Z2= 147.3243	1.979	
208. VOLTS	LN/LN:	1.632		Z0= 143.2435		
	LN/LN/GND:	1.961 (	1.923 GND RETURN KA)			
4LLSC	3P Duty:	2.142	1.	Z1= 129.5701	2.144	2.143
	SLG DUTY:	1.505	1.	Z2= 129.5701	1.506	
208. VOLTS	LN/LN:	1.855		Z0= 299.6540		
	LN/LN/GND:	2.066 (	1.149 GND RETURN KA)			
4LLSD	3P Duty:	1.366	1.	Z1= 203.2155	1.374	1.370
	SLG DUTY:	1.134	1.	Z2= 203.2155	1.135	
208. VOLTS	LN/LN:	1.183		Z0= 337.6042		
	LN/LN/GND:	1.381 (	0.957 GND RETURN KA)			
4LNA	3P Duty:	5.901	3.	Z1= 47.0373	6.364	6.135
	SLG DUTY:	4.875	2.	Z2= 47.0373	5.058	
208. VOLTS	LN/LN:	5.111		Z0= 77.7543		
	LN/LN/GND:	5.823 (	4.129 GND RETURN KA)			
4LNB	3P Duty:	2.242	3.	Z1= 123.7978	2.478	2.361
	SLG DUTY:	2.310	3.	Z2= 123.7978	2.529	
208. VOLTS	LN/LN:	1.942		Z0= 113.0057		
	LN/LN/GND:	2.309 (	2.381 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
4LNC	3P Duty:	3.159	1.	Z1= 87.8567	3.166	3.163
	SLG DUTY:	2.152	1.	Z2= 87.8567	2.152	
208. VOLTS	LN/LN:	2.736		Z0= 214.2863		
	LN/LN/GND:	3.009 (	1.620 GND RETURN KA)			
5HCCB	3P Duty:	7.994	3.	Z1= 15.0464	8.958	8.483
	SLG DUTY:	7.747	2.	Z2= 15.0464	8.019	
480. VOLTS	LN/LN:	6.923		Z0= 17.6457		
	LN/LN/GND:	8.800 (	7.329 GND RETURN KA)			
5HLSB	3P Duty:	5.507	2.	Z1= 21.8420	5.630	5.569
	SLG DUTY:	4.390	1.	Z2= 21.8420	4.404	
480. VOLTS	LN/LN:	4.769		Z0= 40.3174		
	LN/LN/GND:	5.607 (	3.573 GND RETURN KA)			
5HNB	3P Duty:	8.353	5.	Z1= 14.3994	10.254	9.329
	SLG DUTY:	8.581	3.	Z2= 14.3994	9.550	
480. VOLTS	LN/LN:	7.234		Z0= 13.7825		
	LN/LN/GND:	9.232 (	8.711 GND RETURN KA)			
5LCCA	3P Duty:	5.165	3.	Z1= 53.7437	5.633	5.401
	SLG DUTY:	4.509	2.	Z2= 53.7437	4.720	
208. VOLTS	LN/LN:	4.473		Z0= 78.2495		
	LN/LN/GND:	5.177 (	3.978 GND RETURN KA)			
5LCCB	3P Duty:	3.785	3.	Z1= 73.3337	4.233	4.012
	SLG DUTY:	4.026	3.	Z2= 73.3337	4.486	
208. VOLTS	LN/LN:	3.278		Z0= 60.1885		
	LN/LN/GND:	3.937 (	4.299 GND RETURN KA)			
5LEQA	3P Duty:	5.869	3.	Z1= 47.2979	6.393	6.134
	SLG DUTY:	5.063	2.	Z2= 47.2979	5.283	
208. VOLTS	LN/LN:	5.082		Z0= 70.9634		
	LN/LN/GND:	5.881 (	4.423 GND RETURN KA)			
5LEQB	3P Duty:	2.159	1.	Z1= 128.5860	2.184	2.171
	SLG DUTY:	2.171	1.	Z2= 128.5860	2.188	
208. VOLTS	LN/LN:	1.869		Z0= 126.9845		
	LN/LN/GND:	2.234 (	2.180 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
5LLSA	3P Duty:	3.540	2.	Z1= 78.4044	3.617	3.579
	SLG DUTY:	2.991	1.	Z2= 78.4044	3.008	
208. VOLTS	LN/LN:	3.066		Z0= 125.1525		
	LN/LN/GND:	3.594 (	2.557 GND RETURN KA)			
5LLSB	3P Duty:	1.929	2.	Z1= 143.9292	2.050	1.990
	SLG DUTY:	2.010	2.	Z2= 143.9292	2.132	
208. VOLTS	LN/LN:	1.670		Z0= 126.4428		
	LN/LN/GND:	1.983 (	2.099 GND RETURN KA)			
5LNA	3P Duty:	5.824	2.	Z1= 47.6636	6.273	6.050
	SLG DUTY:	4.793	2.	Z2= 47.6636	4.969	
208. VOLTS	LN/LN:	5.043		Z0= 79.4527		
	LN/LN/GND:	5.740 (	4.048 GND RETURN KA)			
5LNB	3P Duty:	2.234	3.	Z1= 124.2641	2.467	2.352
	SLG DUTY:	2.304	3.	Z2= 124.2641	2.522	
208. VOLTS	LN/LN:	1.934		Z0= 113.0057		
	LN/LN/GND:	2.301 (	2.378 GND RETURN KA)			
6HEQA	3P Duty:	7.332	4.	Z1= 16.4040	8.534	7.945
	SLG DUTY:	6.819	2.	Z2= 16.4040	7.284	
480. VOLTS	LN/LN:	6.350		Z0= 20.8227		
	LN/LN/GND:	7.729 (	6.288 GND RETURN KA)			
6HEQB	3P Duty:	8.006	4.	Z1= 15.0237	9.632	8.839
	SLG DUTY:	7.944	3.	Z2= 15.0237	8.697	
480. VOLTS	LN/LN:	6.933		Z0= 15.9598		
	LN/LN/GND:	8.685 (	7.782 GND RETURN KA)			
6HNA	3P Duty:	7.265	4.	Z1= 16.5559	8.474	7.881
	SLG DUTY:	6.830	2.	Z2= 16.5559	7.312	
480. VOLTS	LN/LN:	6.292		Z0= 20.4182		
	LN/LN/GND:	7.690 (	6.360 GND RETURN KA)			
6HNB	3P Duty:	8.099	4.	Z1= 14.8510	9.825	8.984
	SLG DUTY:	8.166	3.	Z2= 14.8510	8.999	
480. VOLTS	LN/LN:	7.014		Z0= 15.0539		
	LN/LN/GND:	8.862 (	8.128 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
6LCCA	3P Duty:	4.935	3.	Z1= 56.2412	5.355	5.148
	SLG DUTY:	4.240	2.	Z2= 56.2412	4.423	
208. VOLTS	LN/LN:	4.274		Z0= 85.0307		
	LN/LN/GND:	4.921 (3.695 GND RETURN KA)				
6LCCB	3P Duty:	3.630	3.	Z1= 76.4750	3.987	3.810
	SLG DUTY:	3.756	3.	Z2= 76.4750	4.061	
208. VOLTS	LN/LN:	3.143		Z0= 68.9571		
	LN/LN/GND:	3.789 (3.888 GND RETURN KA)				
6LEQA	3P Duty:	5.574	3.	Z1= 49.7963	6.038	5.808
	SLG DUTY:	4.726	2.	Z2= 49.7963	4.914	
208. VOLTS	LN/LN:	4.827		Z0= 77.7543		
	LN/LN/GND:	5.553 (4.075 GND RETURN KA)				
6LEQB	3P Duty:	2.229	1.	Z1= 124.5179	2.260	2.245
	SLG DUTY:	2.292	1.	Z2= 124.5179	2.318	
208. VOLTS	LN/LN:	1.931		Z0= 114.4575		
	LN/LN/GND:	2.307 (2.357 GND RETURN KA)				
6LLSA	3P Duty:	3.388	2.	Z1= 81.9168	3.452	3.420
	SLG DUTY:	2.812	1.	Z2= 81.9168	2.826	
208. VOLTS	LN/LN:	2.934		Z0= 135.9307		
	LN/LN/GND:	3.419 (2.375 GND RETURN KA)				
6LLSB	3P Duty:	1.858	2.	Z1= 149.4065	1.946	1.902
	SLG DUTY:	1.886	2.	Z2= 149.4065	1.954	
208. VOLTS	LN/LN:	1.609		Z0= 143.2435		
	LN/LN/GND:	1.930 (1.913 GND RETURN KA)				
6LNA	3P Duty:	5.532	2.	Z1= 50.1718	5.932	5.734
	SLG DUTY:	4.489	2.	Z2= 50.1718	4.642	
208. VOLTS	LN/LN:	4.791		Z0= 86.2482		
	LN/LN/GND:	5.429 (3.755 GND RETURN KA)				
6LNB	3P Duty:	2.225	3.	Z1= 124.7304	2.457	2.342
	SLG DUTY:	2.298	3.	Z2= 124.7304	2.514	
208. VOLTS	LN/LN:	1.927		Z0= 113.0057		
	LN/LN/GND:	2.293 (2.375 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
7-1LNA	3P Duty:	10.291	4.	Z1= 26.9715	12.432	11.388
	SLG DUTY:	10.782	4.	Z2= 26.9715	12.450	
208. VOLTS	LN/LN:	8.913		Z0= 23.4842		
	LN/LN/GND:	11.009 (11.293 GND RETURN KA)				
7-1LNB	3P Duty:	7.305	3.	Z1= 37.9971	8.116	7.716
	SLG DUTY:	6.465	2.	Z2= 37.9971	6.840	
208. VOLTS	LN/LN:	6.326		Z0= 53.5860		
	LN/LN/GND:	7.368 (5.764 GND RETURN KA)				
7-1NLC	3P Duty:	5.499	2.	Z1= 50.4764	5.907	5.705
	SLG DUTY:	4.444	2.	Z2= 50.4764	4.601	
208. VOLTS	LN/LN:	4.762		Z0= 87.4931		
	LN/LN/GND:	5.388 (3.708 GND RETURN KA)				
ATS 7 Load Sid	3P Duty:	1.875	15.	Z1= 7.4028	2.849	2.390
	SLG DUTY:	1.808	14.	Z2= 7.4028	2.716	
4160. VOLTS	LN/LN:	1.624		Z0= 8.2195		
	LN/LN/GND:	1.847 (1.746 GND RETURN KA)				
BHCCA	3P Duty:	9.455	6.	Z1= 12.7216	12.195	10.871
	SLG DUTY:	10.463	4.	Z2= 12.7216	12.212	
480. VOLTS	LN/LN:	8.188		Z0= 9.4230		
	LN/LN/GND:	10.924 (11.585 GND RETURN KA)				
BHCCB	3P Duty:	9.799	6.	Z1= 12.2751	12.966	11.441
	SLG DUTY:	11.150	4.	Z2= 12.2751	13.433	
480. VOLTS	LN/LN:	8.486		Z0= 8.0974		
	LN/LN/GND:	11.491 (12.822 GND RETURN KA)				
BHEQA	3P Duty:	9.658	6.	Z1= 12.4541	12.504	11.130
	SLG DUTY:	10.558	4.	Z2= 12.4541	12.287	
480. VOLTS	LN/LN:	8.364		Z0= 9.6900		
	LN/LN/GND:	11.103 (11.500 GND RETURN KA)				
BHEQB	3P Duty:	9.751	6.	Z1= 12.3354	12.836	11.350
	SLG DUTY:	11.026	4.	Z2= 12.3354	13.190	
480. VOLTS	LN/LN:	8.445		Z0= 8.3611		
	LN/LN/GND:	11.397 (12.569 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
BHLSA	3P Duty:	6.583	3.	Z1= 18.2709	7.556	7.078
	SLG DUTY:	5.984	2.	Z2= 18.2709	6.358	
480. VOLTS	LN/LN:	5.701		Z0= 24.4638		
	LN/LN/GND:	6.839 (5.421 GND RETURN KA)				
BHLSB	3P Duty:	7.168	4.	Z1= 16.7792	8.412	7.803
	SLG DUTY:	6.778	2.	Z2= 16.7792	7.302	
480. VOLTS	LN/LN:	6.208		Z0= 20.3208		
	LN/LN/GND:	7.580 (6.351 GND RETURN KA)				
BHNA	3P Duty:	9.798	6.	Z1= 12.2764	12.910	11.411
	SLG DUTY:	11.082	4.	Z2= 12.2764	13.221	
480. VOLTS	LN/LN:	8.485		Z0= 8.3476		
	LN/LN/GND:	11.494 (12.623 GND RETURN KA)				
BHNB	3P Duty:	9.882	7.	Z1= 12.1721	13.201	11.605
	SLG DUTY:	11.436	4.	Z2= 12.1721	13.958	
480. VOLTS	LN/LN:	8.558		Z0= 7.4685		
	LN/LN/GND:	11.733 (13.463 GND RETURN KA)				
BLCCA	3P Duty:	8.614	5.	Z1= 32.2230	10.540	9.603
	SLG DUTY:	9.873	4.	Z2= 32.2230	11.947	
208. VOLTS	LN/LN:	7.460		Z0= 19.9134		
	LN/LN/GND:	9.539 (11.560 GND RETURN KA)				
BLCCB	3P Duty:	8.705	5.	Z1= 31.8880	10.709	9.734
	SLG DUTY:	9.952	4.	Z2= 31.8880	12.089	
208. VOLTS	LN/LN:	7.538		Z0= 19.9134		
	LN/LN/GND:	9.631 (11.614 GND RETURN KA)				
BLCCC	3P Duty:	2.416	1.	Z1= 114.8879	2.416	2.416
	SLG DUTY:	1.596	1.	Z2= 114.8879	1.596	
208. VOLTS	LN/LN:	2.092		Z0= 296.0801		
	LN/LN/GND:	2.292 (1.183 GND RETURN KA)				
BLCCD	3P Duty:	6.012	2.	Z1= 46.1675	6.122	6.067
	SLG DUTY:	5.204	1.	Z2= 46.1675	5.216	
208. VOLTS	LN/LN:	5.207		Z0= 71.7766		
	LN/LN/GND:	6.319 (4.472 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
BLCCE	3P Duty:	4.052	1.	Z1= 68.5082	4.060	4.056
	SLG DUTY:	2.956	1.	Z2= 68.5082	2.956	
208. VOLTS	LN/LN:	3.509		Z0= 149.2865		
	LN/LN/GND:	3.993 (	2.291 GND RETURN KA)			
BLEQA	3P Duty:	10.498	5.	Z1= 26.4396	13.175	11.877
	SLG DUTY:	12.417	5.	Z2= 26.4396	15.458	
208. VOLTS	LN/LN:	9.092		Z0= 14.1888		
	LN/LN/GND:	11.939 (	15.193 GND RETURN KA)			
BLEQB	3P Duty:	3.934	3.	Z1= 70.5538	4.491	4.217
	SLG DUTY:	4.138	3.	Z2= 70.5538	4.675	
208. VOLTS	LN/LN:	3.407		Z0= 60.1885		
	LN/LN/GND:	4.095 (	4.362 GND RETURN KA)			
BLEQC	3P Duty:	2.860	1.	Z1= 97.0396	2.893	2.877
	SLG DUTY:	2.239	1.	Z2= 97.0396	2.245	
208. VOLTS	LN/LN:	2.477		Z0= 181.9093		
	LN/LN/GND:	2.830 (	1.820 GND RETURN KA)			
BLEQD	3P Duty:	2.758	1.	Z1= 100.6337	2.787	2.772
	SLG DUTY:	2.136	1.	Z2= 100.6337	2.141	
208. VOLTS	LN/LN:	2.389		Z0= 192.7539		
	LN/LN/GND:	2.719 (	1.725 GND RETURN KA)			
BLEQE	3P Duty:	6.372	3.	Z1= 43.5609	7.014	6.697
	SLG DUTY:	5.667	2.	Z2= 43.5609	5.955	
208. VOLTS	LN/LN:	5.518		Z0= 60.7869		
	LN/LN/GND:	6.454 (	5.069 GND RETURN KA)			
BLEQF	3P Duty:	5.935	2.	Z1= 46.7653	6.379	6.159
	SLG DUTY:	5.109	2.	Z2= 46.7653	5.275	
208. VOLTS	LN/LN:	5.140		Z0= 70.7746		
	LN/LN/GND:	5.980 (	4.449 GND RETURN KA)			
BLEQG	3P Duty:	5.526	2.	Z1= 50.2277	5.634	5.580
	SLG DUTY:	4.451	1.	Z2= 50.2277	4.468	
208. VOLTS	LN/LN:	4.786		Z0= 89.5629		
	LN/LN/GND:	5.573 (	3.670 GND RETURN KA)			

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
BLEQH	3P Duty:	7.113	2.	Z1= 39.0238	7.446	7.280
	SLG DUTY:	6.398	1.	Z2= 39.0238	6.477	
208. VOLTS	LN/LN:	6.160		Z0= 54.4930		
	LN/LN/GND:	7.483 (5.708 GND RETURN KA)				
BLEQI	3P Duty:	6.544	2.	Z1= 42.4142	6.770	6.658
	SLG DUTY:	5.648	1.	Z2= 42.4142	5.693	
208. VOLTS	LN/LN:	5.668		Z0= 65.2404		
	LN/LN/GND:	6.775 (4.881 GND RETURN KA)				
BLEQJ	3P Duty:	2.573	1.	Z1= 107.8718	2.596	2.585
	SLG DUTY:	2.085	1.	Z2= 107.8718	2.088	
208. VOLTS	LN/LN:	2.228		Z0= 190.0021		
	LN/LN/GND:	2.600 (1.725 GND RETURN KA)				
BLLSA	3P Duty:	5.827	3.	Z1= 47.6321	6.694	6.268
	SLG DUTY:	6.637	3.	Z2= 47.6321	7.595	
208. VOLTS	LN/LN:	5.047		Z0= 30.1970		
	LN/LN/GND:	6.380 (7.709 GND RETURN KA)				
BLLSB	3P Duty:	3.439	2.	Z1= 80.7018	3.692	3.567
	SLG DUTY:	3.515	2.	Z2= 80.7018	3.672	
208. VOLTS	LN/LN:	2.979		Z0= 76.6235		
	LN/LN/GND:	3.677 (3.577 GND RETURN KA)				
BLLSC	3P Duty:	1.841	1.	Z1= 150.7791	1.841	1.841
	SLG DUTY:	1.232	0.	Z2= 150.7791	1.232	
208. VOLTS	LN/LN:	1.594		Z0= 380.1686		
	LN/LN/GND:	1.752 (0.918 GND RETURN KA)				
BLLSD	3P Duty:	4.420	2.	Z1= 62.8011	4.500	4.460
	SLG DUTY:	4.013	1.	Z2= 62.8011	4.025	
208. VOLTS	LN/LN:	3.828		Z0= 86.7363		
	LN/LN/GND:	4.712 (3.590 GND RETURN KA)				
BLLSE	3P Duty:	3.444	2.	Z1= 80.6071	3.503	3.473
	SLG DUTY:	2.863	1.	Z2= 80.6071	2.874	
208. VOLTS	LN/LN:	2.982		Z0= 133.5163		
	LN/LN/GND:	3.485 (2.418 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
BLLSF	3P Duty:	3.580	2.	Z1= 77.5297	3.661	3.621
	SLG DUTY:	3.038	1.	Z2= 77.5297	3.057	
208. VOLTS	LN/LN:	3.101		Z0= 122.4614		
	LN/LN/GND:	3.640 (2.607 GND RETURN KA)				
BLLSG	3P Duty:	2.232	1.	Z1= 124.3577	2.241	2.236
	SLG DUTY:	1.756	1.	Z2= 124.3577	1.757	
208. VOLTS	LN/LN:	1.933		Z0= 233.2151		
	LN/LN/GND:	2.241 (1.425 GND RETURN KA)				
BLNA	3P Duty:	11.737	5.	Z1= 23.6500	14.800	13.315
	SLG DUTY:	13.544	5.	Z2= 23.6500	16.910	
208. VOLTS	LN/LN:	10.164		Z0= 14.1888		
	LN/LN/GND:	13.053 (16.008 GND RETURN KA)				
BLNC	3P Duty:	3.626	1.	Z1= 76.5543	3.643	3.634
	SLG DUTY:	2.548	1.	Z2= 76.5543	2.550	
208. VOLTS	LN/LN:	3.140		Z0= 176.5314		
	LN/LN/GND:	3.481 (1.948 GND RETURN KA)				
BLND	3P Duty:	8.421	2.	Z1= 32.9624	8.921	8.673
	SLG DUTY:	7.715	2.	Z2= 32.9624	7.855	
208. VOLTS	LN/LN:	7.293		Z0= 43.8244		
	LN/LN/GND:	8.893 (7.000 GND RETURN KA)				
BLNE	3P Duty:	4.989	1.	Z1= 55.6349	5.042	5.015
	SLG DUTY:	3.741	1.	Z2= 55.6349	3.748	
208. VOLTS	LN/LN:	4.321		Z0= 113.9788		
	LN/LN/GND:	4.899 (2.958 GND RETURN KA)				
BLNF	3P Duty:	3.318	1.	Z1= 83.6641	3.326	3.322
	SLG DUTY:	2.461	1.	Z2= 83.6641	2.461	
208. VOLTS	LN/LN:	2.873		Z0= 176.3781		
	LN/LN/GND:	3.277 (1.926 GND RETURN KA)				
CCSWBD	3P Duty:	10.969	11.	Z1= 10.9656	16.077	13.655
	SLG DUTY:	13.744	10.	Z2= 10.9656	19.661	
480. VOLTS	LN/LN:	9.499		Z0= 4.3341		
	LN/LN/GND:	13.449 (18.393 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
DIST PNL R	3P Duty:	6.770	3.	Z1= 41.0006	7.720	7.253
	SLG DUTY:	6.613	3.	Z2= 41.0006	7.189	
208. VOLTS	LN/LN:	5.863		Z0= 44.4972		
	LN/LN/GND:	7.064 (6.434 GND RETURN KA)				
EMER RM 360	3P Duty:	2.527	1.	Z1= 109.8370	2.549	2.538
	SLG DUTY:	2.064	1.	Z2= 109.8370	2.067	
208. VOLTS	LN/LN:	2.189		Z0= 190.0021		
	LN/LN/GND:	2.557 (1.718 GND RETURN KA)				
EQSWBD	3P Duty:	10.997	11.	Z1= 10.9376	16.127	13.695
	SLG DUTY:	13.774	10.	Z2= 10.9376	19.712	
480. VOLTS	LN/LN:	9.524		Z0= 4.3341		
	LN/LN/GND:	13.479 (18.419 GND RETURN KA)				
EQUIP RM 372	3P Duty:	1.576	1.	Z1= 176.1768	1.589	1.582
	SLG DUTY:	1.303	1.	Z2= 176.1768	1.305	
208. VOLTS	LN/LN:	1.364		Z0= 296.2958		
	LN/LN/GND:	1.597 (1.094 GND RETURN KA)				
LSS 1	3P Duty:	1.871	17.	Z1= 7.4159	2.884	2.408
	SLG DUTY:	1.804	15.	Z2= 7.4159	2.750	
4160. VOLTS	LN/LN:	1.621		Z0= 8.2458		
	LN/LN/GND:	1.843 (1.742 GND RETURN KA)				
LSS 2	3P Duty:	1.875	17.	Z1= 7.4000	2.891	2.413
	SLG DUTY:	1.807	15.	Z2= 7.4000	2.754	
4160. VOLTS	LN/LN:	1.624		Z0= 8.2458		
	LN/LN/GND:	1.847 (1.743 GND RETURN KA)				
LSSWBD	3P Duty:	10.738	10.	Z1= 11.2016	15.455	13.212
	SLG DUTY:	13.354	8.	Z2= 11.2016	18.451	
480. VOLTS	LN/LN:	9.299		Z0= 4.6560		
	LN/LN/GND:	13.219 (17.634 GND RETURN KA)				
LVA-A	3P Duty:	11.142	12.	Z1= 10.7949	16.560	13.997
	SLG DUTY:	14.161	12.	Z2= 10.7949	20.862	
480. VOLTS	LN/LN:	9.650		Z0= 3.8933		
	LN/LN/GND:	13.756 (19.421 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
LVA-B	3P Duty:	11.038	12.	Z1= 10.8972	16.360	13.841
	SLG DUTY:	14.077	11.	Z2= 10.8972	20.660	
480. VOLTS	LN/LN:	9.559		Z0= 3.8400		
	LN/LN/GND:	13.710 (19.426 GND RETURN KA)				
MP5C-1	3P Duty:	4.198	2.	Z1= 66.1265	4.446	4.323
	SLG DUTY:	3.294	2.	Z2= 66.1265	3.383	
208. VOLTS	LN/LN:	3.635		Z0= 121.9598		
	LN/LN/GND:	4.079 (2.696 GND RETURN KA)				
MP5C-2	3P Duty:	4.150	2.	Z1= 66.8829	4.393	4.272
	SLG DUTY:	3.248	2.	Z2= 66.8829	3.335	
208. VOLTS	LN/LN:	3.594		Z0= 124.0016		
	LN/LN/GND:	4.030 (2.654 GND RETURN KA)				
MVS 1	3P Duty:	1.875	17.	Z1= 7.4002	2.891	2.413
	SLG DUTY:	1.807	15.	Z2= 7.4002	2.754	
4160. VOLTS	LN/LN:	1.624		Z0= 8.2464		
	LN/LN/GND:	1.847 (1.743 GND RETURN KA)				
MVS 2	3P Duty:	1.875	17.	Z1= 7.4003	2.891	2.413
	SLG DUTY:	1.807	15.	Z2= 7.4003	2.754	
4160. VOLTS	LN/LN:	1.624		Z0= 8.2464		
	LN/LN/GND:	1.847 (1.743 GND RETURN KA)				
PHEQA	3P Duty:	8.407	4.	Z1= 14.3072	10.069	9.257
	SLG DUTY:	8.130	2.	Z2= 14.3072	8.761	
480. VOLTS	LN/LN:	7.281		Z0= 16.5548		
	LN/LN/GND:	9.115 (7.732 GND RETURN KA)				
PLEQA	3P Duty:	8.162	4.	Z1= 34.0059	9.880	9.043
	SLG DUTY:	7.997	4.	Z2= 34.0059	9.534	
208. VOLTS	LN/LN:	7.069		Z0= 36.1349		
	LN/LN/GND:	8.169 (7.837 GND RETURN KA)				
PLNA	3P Duty:	4.547	1.	Z1= 61.0506	4.584	4.565
	SLG DUTY:	3.335	1.	Z2= 61.0506	3.340	
208. VOLTS	LN/LN:	3.937		Z0= 130.2819		
	LN/LN/GND:	4.430 (2.606 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
PNL A	3P Duty:	2.421	1.	Z1= 114.6320	2.422	2.422
	SLG DUTY:	1.654	1.	Z2= 114.6320	1.654	
208. VOLTS	LN/LN:	2.097		Z0= 279.3438		
	LN/LN/GND:	2.325 (	1.244	GND RETURN KA)		
PNL B	3P Duty:	6.116	2.	Z1= 45.3835	6.282	6.199
	SLG DUTY:	5.075	1.	Z2= 45.3835	5.112	
208. VOLTS	LN/LN:	5.297		Z0= 75.4064		
	LN/LN/GND:	6.179 (	4.283	GND RETURN KA)		
PNL BIO MED	3P Duty:	1.713	1.	Z1= 162.0694	1.714	1.713
	SLG DUTY:	1.202	1.	Z2= 162.0694	1.202	
208. VOLTS	LN/LN:	1.483		Z0= 376.3403		
	LN/LN/GND:	1.655 (	0.916	GND RETURN KA)		
PNL L	3P Duty:	2.558	1.	Z1= 108.5125	2.559	2.558
	SLG DUTY:	1.760	1.	Z2= 108.5125	1.760	
208. VOLTS	LN/LN:	2.215		Z0= 261.3840		
	LN/LN/GND:	2.464 (	1.328	GND RETURN KA)		
PNL R	3P Duty:	2.558	1.	Z1= 108.5125	2.559	2.558
	SLG DUTY:	1.760	1.	Z2= 108.5125	1.760	
208. VOLTS	LN/LN:	2.215		Z0= 261.3840		
	LN/LN/GND:	2.464 (	1.328	GND RETURN KA)		
PNL UTIL SHOP	3P Duty:	5.431	2.	Z1= 51.1079	5.532	5.481
	SLG DUTY:	4.348	1.	Z2= 51.1079	4.363	
208. VOLTS	LN/LN:	4.703		Z0= 92.2726		
	LN/LN/GND:	5.465 (	3.571	GND RETURN KA)		
PNL UTIL SHOP	3P Duty:	3.553	1.	Z1= 78.1253	3.573	3.563
	SLG DUTY:	2.548	1.	Z2= 78.1253	2.550	
208. VOLTS	LN/LN:	3.077		Z0= 173.8093		
	LN/LN/GND:	3.436 (	1.967	GND RETURN KA)		
PNL UTIL SHOP	3P Duty:	3.320	1.	Z1= 83.6140	3.336	3.328
	SLG DUTY:	2.351	1.	Z2= 83.6140	2.353	
208. VOLTS	LN/LN:	2.875		Z0= 190.1438		
	LN/LN/GND:	3.197 (	1.805	GND RETURN KA)		

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	* AVG. RMS *
RP5L	3P Duty:	2.454	1.	Z1= 113.1013	2.456	2.455
	SLG DUTY:	1.655	1.	Z2= 113.1013	1.655	
208. VOLTS	LN/LN:	2.125		Z0= 281.2008		
	LN/LN/GND:	2.337 (	1.238 GND RETURN KA)			
RP6L	3P Duty:	2.259	1.	Z1= 122.8742	2.260	2.260
	SLG DUTY:	1.506	1.	Z2= 122.8742	1.506	
208. VOLTS	LN/LN:	1.956		Z0= 311.1646		
	LN/LN/GND:	2.142 (	1.122 GND RETURN KA)			
RP6R	3P Duty:	2.541	1.	Z1= 109.2228	2.567	2.554
	SLG DUTY:	2.110	1.	Z2= 109.2228	2.114	
208. VOLTS	LN/LN:	2.201		Z0= 181.9598		
	LN/LN/GND:	2.579 (	1.778 GND RETURN KA)			
SWGR 1	3P Duty:	1.886	18.	Z1= 7.3568	2.929	2.439
	SLG DUTY:	1.827	18.	Z2= 7.3568	2.837	
4160. VOLTS	LN/LN:	1.634		Z0= 8.0760		
	LN/LN/GND:	1.852 (	1.771 GND RETURN KA)			
SWGR 2	3P Duty:	1.888	18.	Z1= 7.3519	2.932	2.441
	SLG DUTY:	1.828	18.	Z2= 7.3519	2.839	
4160. VOLTS	LN/LN:	1.635		Z0= 8.0760		
	LN/LN/GND:	1.853 (	1.771 GND RETURN KA)			
SWGR PARALLEL	3P Duty:	16.070	19.	Z1= 7.4851	25.052	20.833
	SLG DUTY:	15.978	18.	Z2= 7.4851	24.809	
480. VOLTS	LN/LN:	13.917		Z0= 7.6132		
	LN/LN/GND:	16.054 (	15.888 GND RETURN KA)			

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	D U T I E S (KA) X/R
1 HNB	480.	9.537	6.07	10.734	3.97
19-1LEQA	208.	2.515	2.48	2.624	2.55
19-1LNA	208.	2.554	2.76	2.652	2.75
1CA	208.	1.964	0.58	1.232	0.44
1CB	208.	3.866	1.31	2.773	0.99
1CC	208.	2.273	0.62	1.443	0.47
1CD	208.	3.680	1.27	2.615	0.97
1HCCB	480.	9.458	5.84	10.478	3.79
1HLSB	480.	6.934	3.42	6.429	2.26
1LCCA	208.	6.738	3.04	6.585	2.35
1LCCB	208.	6.502	3.82	7.101	3.52
1LCCC	208.	2.706	0.85	1.838	0.62
1LCCD	208.	3.832	1.66	3.131	1.21
1LCCE	208.	3.742	1.62	3.031	1.19
1LEQA	208.	6.657	2.89	6.026	2.20
1LEQB	208.	2.174	2.55	2.184	2.26
1LLSA	208.	3.885	1.79	3.420	1.33
1LLSB	208.	3.668	3.10	3.937	3.03
1LLSC	208.	2.208	0.89	1.555	0.64
1LLSD	208.	2.114	1.07	1.628	0.75
1LNA	208.	8.259	2.87	7.676	2.14
1LNB	208.	6.622	3.96	7.304	3.73
1LNC	208.	3.098	0.99	2.252	0.69
1WC	208.	3.594	1.26	2.543	0.96
2HEQA	480.	7.822	3.94	7.512	2.54
2HEQB	480.	8.945	5.10	9.506	3.28
2HNA	480.	7.689	3.94	7.441	2.55
2HNB	480.	9.213	5.58	10.107	3.61
2LCCA	208.	6.524	2.93	6.266	2.25
2LCCB	208.	6.151	3.57	6.480	3.14
2LCCC	208.	3.619	1.46	2.733	1.08
2LCCD	208.	3.495	1.39	2.609	1.04
2LCCE	208.	3.301	1.10	2.465	0.77
2LCCF	208.	3.301	1.10	2.465	0.77
2LEQA	208.	6.282	2.77	5.557	2.11
2LEQB	208.	2.252	2.86	2.316	2.72
2LLSA	208.	3.705	1.71	3.192	1.27
2LLSB	208.	3.439	2.44	3.515	2.04
2LLSC	208.	1.925	0.81	1.319	0.59
2LLSD	208.	2.317	1.25	1.868	0.89
2LNA	208.	7.937	2.75	7.241	2.05
2LNB	208.	2.259	2.87	2.322	2.73
3A EM	208.	2.440	0.83	1.637	0.61
3A1	208.	3.666	2.25	2.895	1.77

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	D U T I E S (KA) X/R
3HCCB	480.	8.655	3.77	8.886	2.32
3HLSB	480.	6.124	2.09	5.181	1.36
3HNB	480.	8.909	5.18	9.545	3.34
3LCCA	208.	5.483	2.77	4.896	2.15
3LCCB	208.	3.843	3.14	4.070	3.05
3LCCC	208.	3.928	1.76	3.078	1.32
3LEQA	208.	6.282	2.77	5.557	2.11
3LEQB	208.	2.162	2.54	2.176	2.25
3LLSA	208.	3.705	1.71	3.192	1.27
3LLSB	208.	1.956	2.40	2.030	2.33
3LLSC	208.	1.877	0.80	1.280	0.58
3LLSD	208.	1.487	1.37	1.290	1.04
3LNA	208.	6.233	2.58	5.235	1.98
3LNB	208.	2.251	2.86	2.316	2.73
3LNC	208.	4.280	1.64	3.192	1.25
4AD	208.	3.791	1.75	2.949	1.33
4C	208.	3.791	1.75	2.949	1.33
4DP	208.	3.437	2.19	2.675	1.73
4EML	208.	3.212	1.86	2.438	1.45
4HEQA	480.	7.597	3.79	7.188	2.45
4HEQB	480.	8.519	4.65	8.771	2.99
4HNA	480.	5.617	2.87	4.759	1.98
4HNB	480.	8.623	4.85	9.039	3.13
4L	208.	3.338	2.05	2.571	1.61
4LA	208.	3.323	2.01	2.553	1.58
4LCCA	208.	5.225	2.69	4.581	2.08
4LCCB	208.	3.626	2.56	3.682	2.18
4LEQA	208.	5.947	2.67	5.154	2.03
4LEQB	208.	2.239	2.85	2.307	2.72
4LEQC	208.	3.849	1.58	2.879	1.20
4LLSA	208.	3.540	1.64	2.991	1.22
4LLSB	208.	1.884	2.16	1.905	1.94
4LLSC	208.	2.142	0.90	1.505	0.66
4LLSD	208.	1.366	1.22	1.134	0.91
4LNA	208.	5.901	2.51	4.875	1.92
4LNB	208.	2.242	2.85	2.310	2.72
4LNC	208.	3.159	1.01	2.152	0.76
5HCCB	480.	7.994	3.06	7.747	1.89
5HLSB	480.	5.507	1.66	4.390	1.09
5HNB	480.	8.353	4.58	8.581	2.95
5LCCA	208.	5.165	2.67	4.509	2.07

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	D U T I E S (KA) X/R
5LCCB	208.	3.785	3.02	4.026	2.97
5LEQA	208.	5.869	2.65	5.063	2.02
5LEQB	208.	2.159	1.41	2.171	1.30
5LLSA	208.	3.540	1.64	2.991	1.22
5LLSB	208.	1.929	2.30	2.010	2.26
5LNA	208.	5.824	2.49	4.793	1.91
5LNB	208.	2.234	2.85	2.304	2.72
6HEQA	480.	7.332	3.63	6.819	2.37
6HEQB	480.	8.006	4.20	7.944	2.72
6HNA	480.	7.265	3.67	6.830	2.40
6HNB	480.	8.099	4.35	8.166	2.81
6LCCA	208.	4.935	2.59	4.240	2.01
6LCCB	208.	3.630	2.77	3.756	2.54
6LEQA	208.	5.574	2.57	4.726	1.96
6LEQB	208.	2.229	1.48	2.292	1.41
6LLSA	208.	3.388	1.59	2.812	1.17
6LLSB	208.	1.858	2.08	1.886	1.90
6LNA	208.	5.532	2.42	4.489	1.87
6LNB	208.	2.225	2.84	2.298	2.71
7-1LNA	208.	10.291	4.27	10.782	3.51
7-1LNB	208.	7.305	2.93	6.465	2.23
7-1NLC	208.	5.499	2.45	4.444	1.89
ATS 7 Load Sid	4160.	1.875	14.82	1.808	13.51
BHCCA	480.	9.455	5.70	10.463	3.68
BHCCB	480.	9.799	6.41	11.150	4.22
BHEQA	480.	9.658	5.79	10.558	3.63
BHEQB	480.	9.751	6.26	11.026	4.09
BHLSA	480.	6.583	3.41	5.984	2.29
BHLSB	480.	7.168	3.77	6.778	2.49
BHNA	480.	9.798	6.29	11.082	4.05
BHNB	480.	9.882	6.72	11.436	4.46
BLCCA	208.	8.614	4.51	9.873	4.30
BLCCB	208.	8.705	4.62	9.952	4.38
BLCCC	208.	2.416	0.73	1.596	0.53
BLCCD	208.	6.012	1.57	5.204	1.04
BLCCE	208.	4.052	1.01	2.956	0.69
BLEQA	208.	10.498	5.04	12.417	4.87
BLEQB	208.	3.934	3.33	4.138	3.18
BLEQC	208.	2.860	1.40	2.239	1.05
BLEQD	208.	2.758	1.37	2.136	1.03
BLEQE	208.	6.372	2.80	5.667	2.13

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	X/R	D U T I E S (KA)
BLEQF	208.	5.935	2.46	5.109	1.84	
BLEQG	208.	5.526	1.60	4.451	1.13	
BLEQH	208.	7.113	2.07	6.398	1.43	
BLEQI	208.	6.544	1.88	5.648	1.30	
BLEQJ	208.	2.573	1.33	2.085	0.95	
BLLSA	208.	5.827	3.43	6.637	3.37	
BLLSB	208.	3.439	2.44	3.515	2.04	
BLLSC	208.	1.841	0.69	1.232	0.49	
BLLSD	208.	4.420	1.57	4.013	1.09	
BLLSE	208.	3.444	1.55	2.863	1.14	
BLLSF	208.	3.580	1.66	3.038	1.23	
BLLSG	208.	2.232	1.13	1.756	0.79	
BLNA	208.	11.737	5.15	13.544	4.93	
BLNC	208.	3.626	1.17	2.548	0.89	
BLND	208.	8.421	2.25	7.715	1.57	
BLNE	208.	4.989	1.38	3.741	1.00	
BLNF	208.	3.318	1.05	2.461	0.73	
CCSWBD	480.	10.969	11.32	13.744	9.70	
DIST PNL R	208.	6.770	3.31	6.613	2.62	
EMER RM 360	208.	2.527	1.32	2.064	0.95	
EQSWBD	480.	10.997	11.37	13.774	9.72	
EQUIP RM 372	208.	1.576	1.32	1.303	0.96	
LSS 1	4160.	1.871	16.77	1.804	15.20	
LSS 2	4160.	1.875	16.82	1.807	15.23	
LSSWBD	480.	10.738	10.07	13.354	7.97	
LVA-A	480.	11.142	12.48	14.161	11.73	
LVA-B	480.	11.038	12.24	14.077	11.42	
MP5C-1	208.	4.198	2.25	3.294	1.75	
MP5C-2	208.	4.150	2.24	3.248	1.74	
MVS 1	4160.	1.875	16.81	1.807	15.22	
MVS 2	4160.	1.875	16.81	1.807	15.22	
PHEQA	480.	8.407	4.11	8.130	2.50	
PLEQA	208.	8.162	4.31	7.997	4.04	
PLNA	208.	4.547	1.31	3.335	0.96	
PNL A	208.	2.421	0.79	1.654	0.56	
PNL B	208.	6.116	1.75	5.075	1.27	
PNL BIO MED	208.	1.713	0.84	1.202	0.60	
PNL L	208.	2.558	0.80	1.760	0.56	
PNL R	208.	2.558	0.80	1.760	0.56	
PNL UTIL SHOP	208.	5.431	1.58	4.348	1.12	
PNL UTIL SHOP	208.	3.553	1.22	2.548	0.91	

VA Clarksburg
Generator Contribution

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	D U T I E S (KA) X/R
PNL UTIL SHOP	208.	3.320	1.18	2.351	0.89
RP5L	208.	2.454	0.87	1.655	0.64
RP6L	208.	2.259	0.84	1.506	0.63
RP6R	208.	2.541	1.37	2.110	1.00
SWGR 1	4160.	1.886	18.02	1.827	18.03
SWGR 2	4160.	1.888	18.03	1.828	18.04
SWGR PARALLEL	480.	16.070	18.75	15.978	18.00

328 FAULTED BUSES, 334 BRANCHES, 8 CONTRIBUTIONS
UNBALANCED FAULTS REQUESTED

*** SHORT CIRCUIT STUDY COMPLETE ***

VA Clarksburg
Generator Contribution

T H R E E P H A S E M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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 5LLSA          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 5LLSB          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 5LNA           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 5LNB           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6HEQA          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 6HEQB          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 6HNA           VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 6HNB           VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 6LCCA          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LCCB          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LEQA          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LEQB          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LLSA          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LLSB          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LNA           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LNB           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 7-1LNA         VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 7-1LNB         VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 7-1NLC         VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 ATS 7 Load Sid E/Z:      1.855 KA AT  -85.66 DEG (  13.36 MVA)  X/R:    14.97
               SYM*1.6:    2.968 KA       MOMENTARY BASED ON X/R:    2.822 KA
               SYM*2.7:    5.008 KA           CREST BASED ON X/R:    4.750 KA
               VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0979 + J  1.2912  OHMS
               CBL-0302       BUS-0344           0.000 KA      ANG:   -24.47
               ATS 7          BUS-0342           1.855 KA      ANG:   -85.66
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T H R E E P H A S E M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LSS 1	E/Z:	1.852 KA AT -86.10 DEG (13.34 MVA)	X/R:	16.94	
	SYM*1.6:	2.963 KA	MOMENTARY BASED ON X/R:	2.857 KA	
	SYM*2.7:	5.000 KA	CREST BASED ON X/R:	4.794 KA	
	VOLTAGE:	4160. EQUIV. IMPEDANCE= 0.0883 + J 1.2941 OHMS			
	CBL-0006	SWGR 1	1.852 KA	ANG:	-86.10
LSS 2	E/Z:	1.855 KA AT -86.13 DEG (13.37 MVA)	X/R:	16.98	
	SYM*1.6:	2.968 KA	MOMENTARY BASED ON X/R:	2.863 KA	
	SYM*2.7:	5.009 KA	CREST BASED ON X/R:	4.804 KA	
	VOLTAGE:	4160. EQUIV. IMPEDANCE= 0.0874 + J 1.2917 OHMS			
	CBL-0009	MVS 1	0.085 KA	ANG:	-77.71
	CBL-0013	SWGR 2	1.714 KA	ANG:	-86.83
	CBL-0015	MVS 2	0.057 KA	ANG:	-257.74
LSSWBD	VOLTAGE:	480. (SEE LOW VOLTAGE REPORT)			
LVA-A	VOLTAGE:	480. (SEE LOW VOLTAGE REPORT)			
LVA-B	VOLTAGE:	480. (SEE LOW VOLTAGE REPORT)			
MP5C-1	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
MP5C-2	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
MVS 1	E/Z:	1.855 KA AT -86.13 DEG (13.37 MVA)	X/R:	16.98	
	SYM*1.6:	2.968 KA	MOMENTARY BASED ON X/R:	2.863 KA	
	SYM*2.7:	5.009 KA	CREST BASED ON X/R:	4.804 KA	
	VOLTAGE:	4160. EQUIV. IMPEDANCE= 0.0874 + J 1.2917 OHMS			
	T 1500 A	LVA-A	0.085 KA	ANG:	-257.71
	CBL-0009	LSS 2	1.771 KA	ANG:	93.47
MVS 2	E/Z:	1.855 KA AT -86.13 DEG (13.37 MVA)	X/R:	16.98	
	SYM*1.6:	2.968 KA	MOMENTARY BASED ON X/R:	2.863 KA	
	SYM*2.7:	5.009 KA	CREST BASED ON X/R:	4.804 KA	
	VOLTAGE:	4160. EQUIV. IMPEDANCE= 0.0874 + J 1.2917 OHMS			
	CBL-0015	LSS 2	1.798 KA	ANG:	-86.40
	T 1500 B	LVA-B	0.057 KA	ANG:	-77.74
PHEQA	VOLTAGE:	480. (SEE LOW VOLTAGE REPORT)			
PLEQA	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
PLNA	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
PNL A	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
PNL B	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			

T H R E E P H A S E M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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 PNL BIO MED    VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL L          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL R          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL UTIL SHOP  VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL UTIL SHOP  VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL UTIL SHOP  VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 RP5L           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 RP6L           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 RP6R           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 SWGR 1         E/Z:      1.866 KA AT  -86.32 DEG (  13.45 MVA)  X/R:    18.19
                SYM*1.6:    2.986 KA       MOMENTARY BASED ON X/R:    2.901 KA
                SYM*2.7:    5.039 KA           CREST BASED ON X/R:    4.860 KA
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0825 + J  1.2842  OHMS
                CBL-0306       BUS-0349           0.000 KA      ANG:  -205.97
                CBL-0004       GENERATOR BUS      1.866 KA      ANG:    93.68

 SWGR 2         E/Z:      1.867 KA AT  -86.33 DEG (  13.46 MVA)  X/R:    18.21
                SYM*1.6:    2.988 KA       MOMENTARY BASED ON X/R:    2.903 KA
                SYM*2.7:    5.042 KA           CREST BASED ON X/R:    4.863 KA
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0822 + J  1.2835  OHMS
                CBL-0002       BUS-0004           0.000 KA      ANG:   -83.20
                CBL-0005       GENERATOR BUS      1.727 KA      ANG:    92.96
                CBL-0013       LSS 2              0.142 KA      ANG:  -257.71

 SWGR PARALLEL  VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )
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U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	1.85	15.0	Z1= 7.4824	2.97	2.82
ATS 7 Load Sid	SLG DUTY:	1.80	13.6	Z2= 7.4824	2.87	2.70
4160.	VOLTS LN/LN:	1.61		Z0= 8.2195		
	LN/LN/GND:	1.83 (		1.74 GND RETURN KA)		
	3P Duty:	1.85	16.9	Z1= 7.4950	2.96	2.86
LSS 1	SLG DUTY:	1.79	15.3	Z2= 7.4950	2.87	2.73
4160.	VOLTS LN/LN:	1.60		Z0= 8.2458		
	LN/LN/GND:	1.83 (		1.74 GND RETURN KA)		
	3P Duty:	1.86	17.0	Z1= 7.4811	2.97	2.86
LSS 2	SLG DUTY:	1.79	15.3	Z2= 7.4811	2.87	2.74
4160.	VOLTS LN/LN:	1.61		Z0= 8.2458		
	LN/LN/GND:	1.83 (		1.74 GND RETURN KA)		
	3P Duty:	1.86	17.0	Z1= 7.4813	2.97	2.86
MVS 1	SLG DUTY:	1.79	15.3	Z2= 7.4813	2.87	2.74
4160.	VOLTS LN/LN:	1.61		Z0= 8.2464		
	LN/LN/GND:	1.83 (		1.74 GND RETURN KA)		
	3P Duty:	1.86	17.0	Z1= 7.4813	2.97	2.86
MVS 2	SLG DUTY:	1.79	15.3	Z2= 7.4813	2.87	2.74
4160.	VOLTS LN/LN:	1.61		Z0= 8.2464		
	LN/LN/GND:	1.83 (		1.74 GND RETURN KA)		
	3P Duty:	1.87	18.2	Z1= 7.4361	2.99	2.90
SWGR 1	SLG DUTY:	1.81	18.1	Z2= 7.4361	2.90	2.82
4160.	VOLTS LN/LN:	1.62		Z0= 8.0760		
	LN/LN/GND:	1.84 (		1.77 GND RETURN KA)		
	3P Duty:	1.87	18.2	Z1= 7.4318	2.99	2.90
SWGR 2	SLG DUTY:	1.82	18.2	Z2= 7.4318	2.90	2.82
4160.	VOLTS LN/LN:	1.62		Z0= 8.0760		
	LN/LN/GND:	1.84 (		1.77 GND RETURN KA)		

M O M E N T A R Y D U T Y S U M M A R Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
SOLUTION METHOD : E/Z

BUS RECORD NO	NAME	VOLTAGE L-L	* 3 P H A S E * KA	X/R	* * * SLG * * * KA	X/R
ATS 7 Load Sid		4160.	2.822	14.97	2.700	13.60
LSS 1		4160.	2.857	16.94	2.733	15.30
LSS 2		4160.	2.863	16.98	2.737	15.32
MVS 1		4160.	2.863	16.98	2.737	15.32
MVS 2		4160.	2.863	16.98	2.737	15.32
SWGR 1		4160.	2.901	18.19	2.819	18.15
SWGR 2		4160.	2.903	18.21	2.821	18.16

13 FAULTED BUSES, 334 BRANCHES, 8 CONTRIBUTIONS
UNBALANCED FAULTS REQUESTED

*** SHORT CIRCUIT STUDY COMPLETE ***

T H R E E P H A S E I N T E R R U P U T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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 5LLSA          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 5LLSB          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 5LNA           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 5LNB           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6HEQA          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 6HEQB          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 6HNA           VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 6HNB           VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 6LCCA          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LCCB          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LEQA          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LEQB          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LLSA          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LLSB          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LNA           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 6LNB           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 7-1LNA         VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 7-1LNB         VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 7-1NLC         VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 ATS 7 Load Sid E/Z:      1.781 KA AT  -86.13 DEG (  12.83 MVA)  X/R:    15.51
                VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0911 + J  1.3452  OHMS
                CONTRIBUTIONS:  BUS-0342           1.781 KA      ANG:   -86.13

                GENERATOR NAME -- AT BUS --   KA    VOLTS PU  LOCAL/REMOTE
              GEN MV                         1.716     0.02         L
                TOTAL REMOTE:     0.000 KA  NACD RATIO:  0.0000
```

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	1.781	1.781	1.781	1.781

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.334	1.131	1.017	1.002
DUTY (KA) :	2.376	2.014	1.812	1.785

BHCCA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHCCB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHEQA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHEQB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHLSA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHLSB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHNA	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BHNB	VOLTAGE:	480.	(SEE LOW VOLTAGE REPORT)
BLCCA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLCCB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLCCC	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLCCD	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLCCE	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQA	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQB	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQC	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)
BLEQD	VOLTAGE:	208.	(SEE LOW VOLTAGE REPORT)

T H R E E P H A S E I N T E R R U P U T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

EQUIP RM 372 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

LSS 1 E/Z: 1.779 KA AT -86.55 DEG (12.82 MVA) X/R: 17.53
VOLTAGE: 4160. EQUIV. IMPEDANCE= 0.0813 + J 1.3477 OHMS
CBL-0006 SWGR 1 1.779 KA ANG: -86.55

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
GEN MV 1.714 0.01 L
TOTAL REMOTE: 0.000 KA NACD RATIO: 0.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	1.779	1.779	1.779	1.779

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.360	1.154	1.033	1.000
DUTY (KA) :	2.419	2.053	1.837	1.779

LSS 2 E/Z: 1.780 KA AT -86.56 DEG (12.83 MVA) X/R: 17.56
VOLTAGE: 4160. EQUIV. IMPEDANCE= 0.0809 + J 1.3466 OHMS
CBL-0009 MVS 1 0.041 KA ANG: -79.11
CBL-0013 SWGR 2 1.714 KA ANG: -86.83
CBL-0015 MVS 2 0.025 KA ANG: -260.87

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
GEN MV 1.714 0.01 L
TOTAL REMOTE: 0.000 KA NACD RATIO: 0.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	1.780	1.780	1.780	1.780

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.360	1.154	1.033	1.000
DUTY (KA) :	2.422	2.055	1.839	1.780

LSSWBD VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

LVA-A VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

LVA-B VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

MP5C-1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

T H R E E P H A S E I N T E R R U P U T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

```
 MP5C-2          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 MVS 1           E/Z:      1.780 KA AT  -86.56 DEG (  12.83 MVA)  X/R:    17.56
                 VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0809 + J  1.3467  OHMS
                 T 1500 A        LVA-A              0.041 KA      ANG:  -259.11
                 CBL-0009        LSS 2              1.740 KA      ANG:    93.26

                     GENERATOR NAME -- AT BUS --   KA    VOLTS PU  LOCAL/REMOTE
               GEN MV                          1.714     0.01         L
                     TOTAL REMOTE:     0.000 KA  NACD RATIO:  0.0000

                                SYM2     SYM3     SYM5     SYM8
                     MULT. FACT:    1.000    1.000    1.000    1.000
                     DUTY (KA) :    1.780    1.780    1.780    1.780

                                TOT2     TOT3     TOT5     TOT8
                     MULT. FACT:    1.360    1.154    1.033    1.000
                     DUTY (KA) :    2.422    2.055    1.839    1.780

 MVS 2           E/Z:      1.780 KA AT  -86.56 DEG (  12.83 MVA)  X/R:    17.56
                 VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0809 + J  1.3467  OHMS
                 CBL-0015        LSS 2              1.755 KA      ANG:   -86.64
                 T 1500 B        LVA-B              0.025 KA      ANG:   -80.87

                     GENERATOR NAME -- AT BUS --   KA    VOLTS PU  LOCAL/REMOTE
               GEN MV                          1.714     0.01         L
                     TOTAL REMOTE:     0.000 KA  NACD RATIO:  0.0000

                                SYM2     SYM3     SYM5     SYM8
                     MULT. FACT:    1.000    1.000    1.000    1.000
                     DUTY (KA) :    1.780    1.780    1.780    1.780

                                TOT2     TOT3     TOT5     TOT8
                     MULT. FACT:    1.360    1.154    1.033    1.000
                     DUTY (KA) :    2.422    2.055    1.839    1.780

 PHEQA           VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

 PLEQA           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PLNA            VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL A           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )
```

T H R E E P H A S E I N T E R R U P U T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

```
 PNL B           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL BIO MED     VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL L           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL R           VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL UTIL SHOP   VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL UTIL SHOP   VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 PNL UTIL SHOP   VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 RP5L            VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 RP6L            VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 RP6R            VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

 SWGR 1          E/Z:      1.792 KA AT  -86.77 DEG (  12.91 MVA)  X/R:    18.83
                 VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0755 + J  1.3379  OHMS
                 CONTRIBUTIONS:  GENERATOR BUS      1.792 KA      ANG:    93.23

                 GENERATOR NAME -- AT BUS --   KA    VOLTS PU  LOCAL/REMOTE
               GEN MV                         1.727     0.00         L
                 TOTAL REMOTE:     0.000 KA  NACD RATIO:  0.0000

                                  SYM2     SYM3     SYM5     SYM8
                 MULT. FACT:     1.000    1.000    1.000    1.000
                 DUTY (KA) :     1.792    1.792    1.792    1.792

                                  TOT2     TOT3     TOT5     TOT8
                 MULT. FACT:     1.377    1.169    1.043    1.000
                 DUTY (KA) :     2.468    2.095    1.869    1.792

 SWGR 2          E/Z:      1.793 KA AT  -86.77 DEG (  12.92 MVA)  X/R:    18.84
                 VOLTAGE:   4160.   EQUIV. IMPEDANCE=  0.0754 + J  1.3376  OHMS
                 CONTRIBUTIONS:  GENERATOR BUS      1.727 KA      ANG:    92.96
                 CBL-0013        LSS 2              0.066 KA      ANG:  -259.78
```

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

	GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
GEN	MV	1.727	0.00	L

TOTAL REMOTE: 0.000 KA NACD RATIO: 0.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	1.793	1.793	1.793	1.793

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.377	1.169	1.043	1.000
DUTY (KA) :	2.468	2.095	1.870	1.793

SWGR PARALLEL VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R		ANSI AC/DC DECREMENT FACT. 3 PHASE	SLG	INTERRUPTING DUTIES (KA) 3 PHASE	SLG
ATS 7 Load Sid	3P Duty:	1.78	15.5	SYM2:	1.00	1.00	1.78	1.75
VOLTS: 4160.0	SLG:	1.75	13.9	SYM3:	1.00	1.00	1.78	1.75
NACD: 0.000	LN/LN:	1.54		SYM5:	1.00	1.00	1.78	1.75
	LN/LN/GND:	1.77		SYM8:	1.00	1.00	1.78	1.75
	GND RETURN:	1.72		TOT2:	1.33	1.34	2.38	2.34
	Z1(PU):		7.79127	TOT3:	1.13	1.13	2.01	1.98
	Z2(PU):		7.79127	TOT5:	1.02	1.05	1.81	1.84
	Z0(PU):		8.21953	TOT8:	1.00	1.00	1.79	1.75
LSS 1	3P Duty:	1.78	17.5	SYM2:	1.00	1.00	1.78	1.75
VOLTS: 4160.0	SLG:	1.75	15.7	SYM3:	1.00	1.00	1.78	1.75
NACD: 0.000	LN/LN:	1.54		SYM5:	1.00	1.00	1.78	1.75
	LN/LN/GND:	1.77		SYM8:	1.00	1.02	1.78	1.78
	GND RETURN:	1.71		TOT2:	1.36	1.37	2.42	2.39
	Z1(PU):		7.80208	TOT3:	1.15	1.16	2.05	2.03
	Z2(PU):		7.80208	TOT5:	1.03	1.07	1.84	1.87
	Z0(PU):		8.24583	TOT8:	1.00	1.01	1.78	1.76
LSS 2	3P Duty:	1.78	17.6	SYM2:	1.00	1.00	1.78	1.75
VOLTS: 4160.0	SLG:	1.75	15.7	SYM3:	1.00	1.00	1.78	1.75
NACD: 0.000	LN/LN:	1.54		SYM5:	1.00	1.00	1.78	1.75
	LN/LN/GND:	1.77		SYM8:	1.00	1.02	1.78	1.78
	GND RETURN:	1.71		TOT2:	1.36	1.37	2.42	2.39
	Z1(PU):		7.79540	TOT3:	1.15	1.16	2.05	2.03
	Z2(PU):		7.79540	TOT5:	1.03	1.07	1.84	1.87
	Z0(PU):		8.24583	TOT8:	1.00	1.01	1.78	1.76
MVS 1	3P Duty:	1.78	17.6	SYM2:	1.00	1.00	1.78	1.75
VOLTS: 4160.0	SLG:	1.75	15.7	SYM3:	1.00	1.00	1.78	1.75
NACD: 0.000	LN/LN:	1.54		SYM5:	1.00	1.00	1.78	1.75
	LN/LN/GND:	1.77		SYM8:	1.00	1.02	1.78	1.78
	GND RETURN:	1.71		TOT2:	1.36	1.37	2.42	2.39
	Z1(PU):		7.79562	TOT3:	1.15	1.16	2.05	2.03
	Z2(PU):		7.79562	TOT5:	1.03	1.07	1.84	1.87
	Z0(PU):		8.24643	TOT8:	1.00	1.01	1.78	1.76

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R		ANSI AC/DC DECREMENT FACT. 3 PHASE	SLG	INTERRUPTING DUTIES (KA) 3 PHASE	SLG
MVS 2	3P Duty:	1.78	17.6	SYM2:	1.00	1.00	1.78	1.75
VOLTS: 4160.0	SLG:	1.75	15.7	SYM3:	1.00	1.00	1.78	1.75
NACD: 0.000	LN/LN:	1.54		SYM5:	1.00	1.00	1.78	1.75
	LN/LN/GND:	1.77		SYM8:	1.00	1.02	1.78	1.78
	GND RETURN:	1.71		TOT2:	1.36	1.37	2.42	2.39
	Z1(PU):		7.79562	TOT3:	1.15	1.16	2.05	2.03
	Z2(PU):		7.79562	TOT5:	1.03	1.07	1.84	1.87
	Z0(PU):		8.24643	TOT8:	1.00	1.01	1.78	1.76
SWGR 1	3P Duty:	1.79	18.8	SYM2:	1.00	1.00	1.79	1.77
VOLTS: 4160.0	SLG:	1.77	18.6	SYM3:	1.00	1.01	1.79	1.78
NACD: 0.000	LN/LN:	1.55		SYM5:	1.00	1.01	1.79	1.79
	LN/LN/GND:	1.78		SYM8:	1.00	1.04	1.79	1.84
	GND RETURN:	1.74		TOT2:	1.38	1.41	2.47	2.49
	Z1(PU):		7.74337	TOT3:	1.17	1.20	2.09	2.12
	Z2(PU):		7.74337	TOT5:	1.04	1.10	1.87	1.95
	Z0(PU):		8.07597	TOT8:	1.00	1.03	1.79	1.83
SWGR 2	3P Duty:	1.79	18.8	SYM2:	1.00	1.00	1.79	1.77
VOLTS: 4160.0	SLG:	1.77	18.6	SYM3:	1.00	1.01	1.79	1.78
NACD: 0.000	LN/LN:	1.55		SYM5:	1.00	1.01	1.79	1.79
	LN/LN/GND:	1.78		SYM8:	1.00	1.04	1.79	1.84
	GND RETURN:	1.74		TOT2:	1.38	1.41	2.47	2.49
	Z1(PU):		7.74129	TOT3:	1.17	1.20	2.10	2.12
	Z2(PU):		7.74129	TOT5:	1.04	1.10	1.87	1.95
	Z0(PU):		8.07597	TOT8:	1.00	1.03	1.79	1.83

VA Clarksburg
Generator Contribution

I N T E R R U P T I N G D U T Y S U M M A R Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

BUS RECORD NO NAME	VOLTAGE L-L	NACD RATIO	* 3 P H A S E * E/Z KA	X/R	* * * S L G * * * E/Z KA	X/R
ATS 7 Load Sid	4160.	0.000	1.781	15.51	1.749	13.92
LSS 1	4160.	0.000	1.779	17.53	1.746	15.66
LSS 2	4160.	0.000	1.780	17.56	1.747	15.67
MVS 1	4160.	0.000	1.780	17.56	1.747	15.67
MVS 2	4160.	0.000	1.780	17.56	1.747	15.67
SWGR 1	4160.	0.000	1.792	18.83	1.767	18.56
SWGR 2	4160.	0.000	1.793	18.84	1.767	18.56

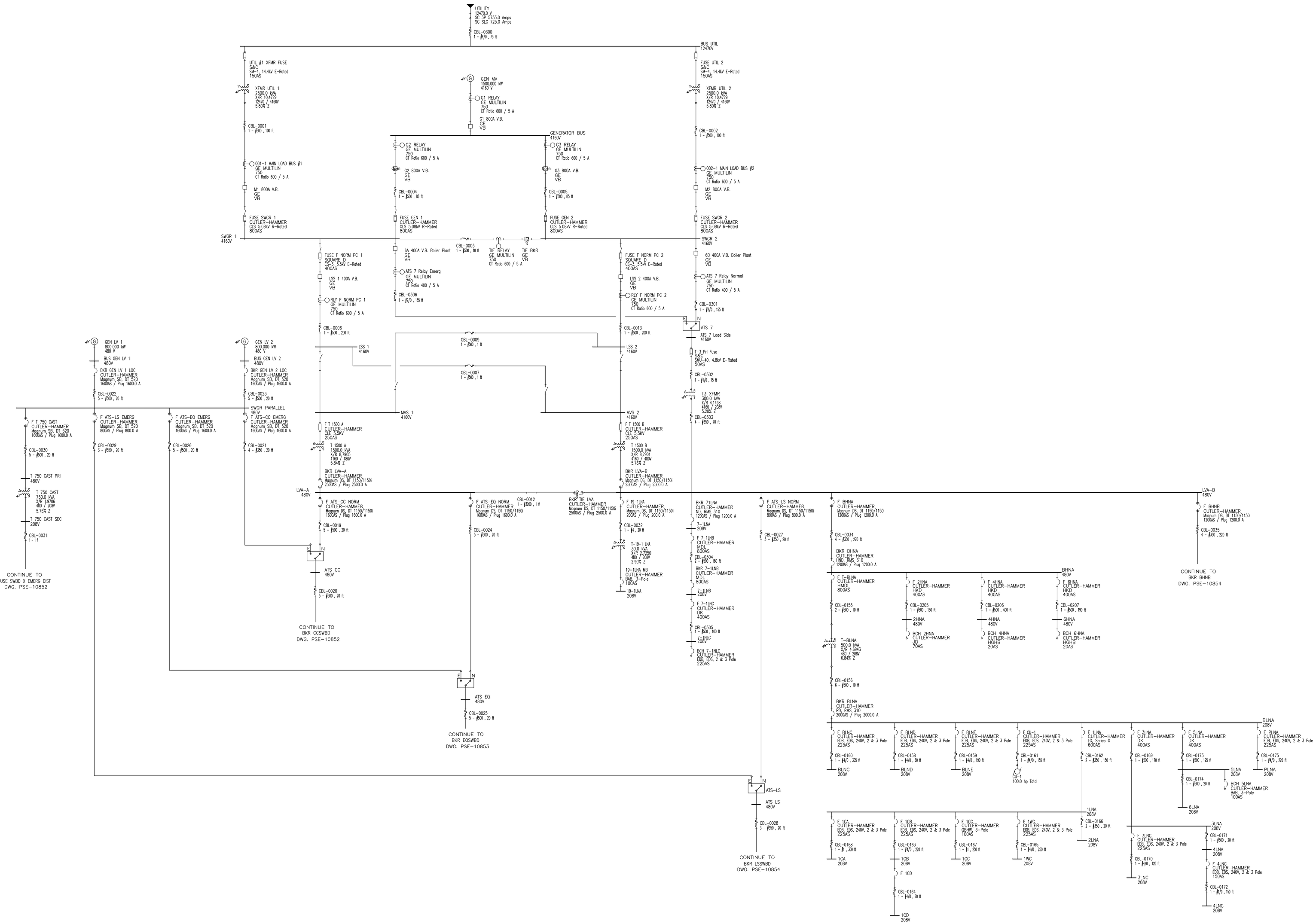
13 FAULTED BUSES, 334 BRANCHES, 8 CONTRIBUTIONS
UNBALANCED FAULTS REQUESTED

*** SHORT CIRCUIT STUDY COMPLETE ***

C. APPENDIX C – ONE-LINE DIAGRAMS

See power system study one-line diagrams on the attached sheets.

PSE-10851 to PSE-10854



REVISION		
01	02	
GENERAL REVISION E.CARPER 11-29-12		

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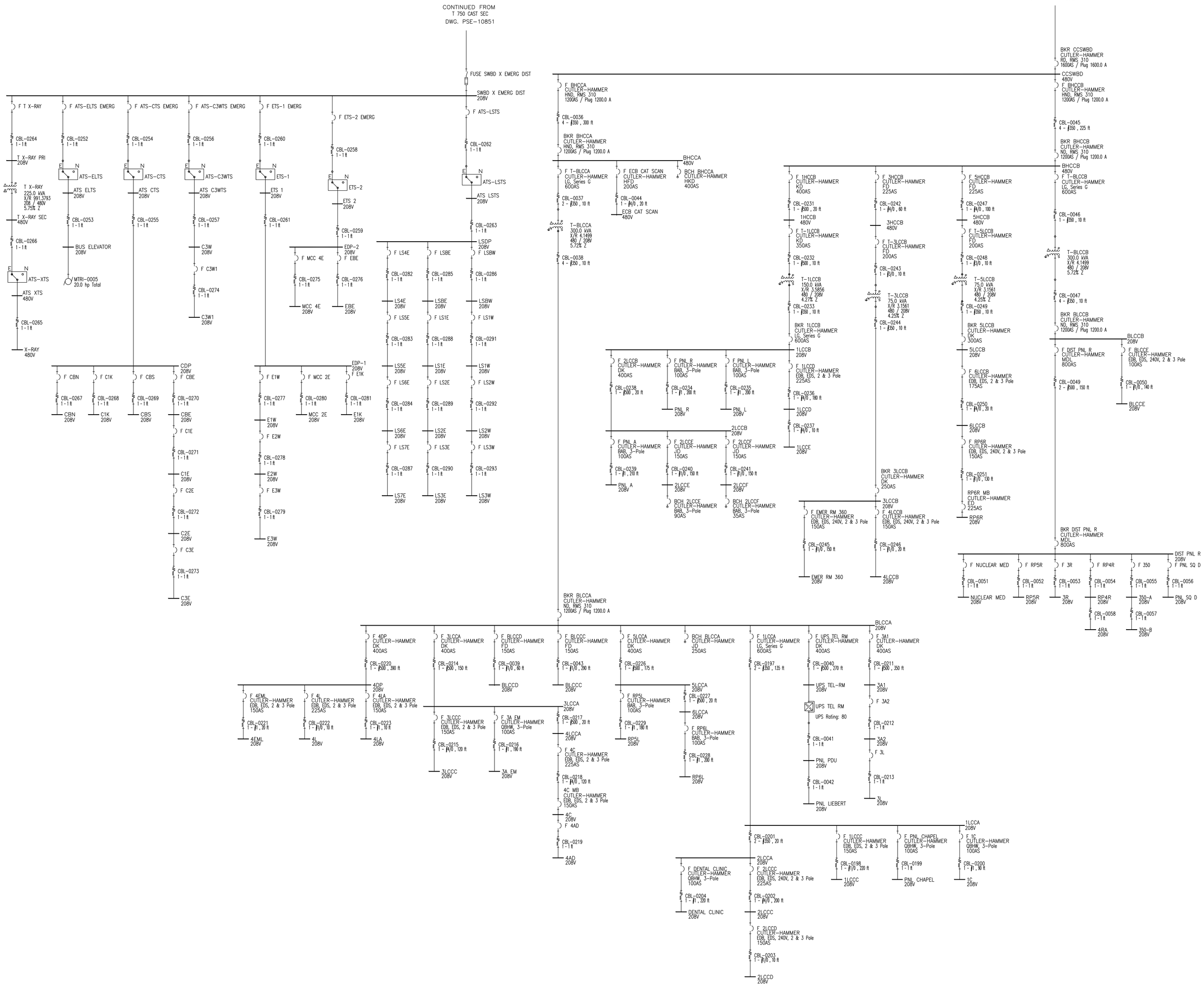
DFTR P.FILKO	DATE 8-03-11	EATON | Electrical Services & Systems	
ENGR E.CARPER	DATE 8-04-11	TITLE VA MEDICAL CENTER CLARKSBURG, WV	
SCALE NONE		TYPE POWER SYSTEM STUDY	ONE-LINE
CAD FILENAME PSE-10851	PRODUCT CODE U0160	REVISION 02	G.O. MPG03517
DWG PSE-10851	SHEET 1 OF 4		



REVISION		
01	02	
		GENERAL REVISION E.CARPER 11-29-12

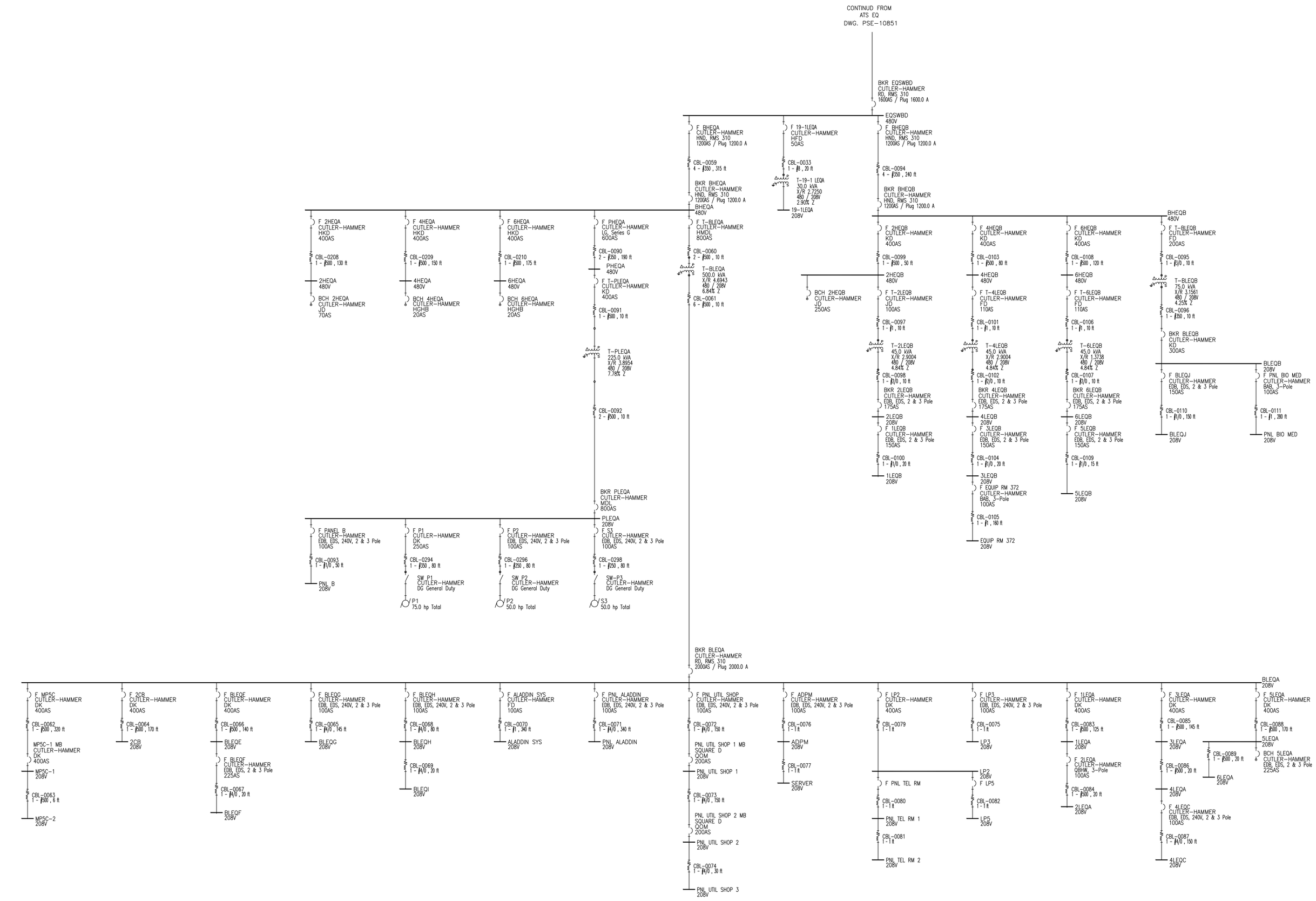
DFTR	DATE
P.FILKO	8-03-11
ENGR	DATE
E.CARPER	8-04-11
SCALE	NONE

EATON | Electrical Services & Systems

TITLE: VA MEDICAL CENTER
CLARKSBURG, WV

TYPE: POWER SYSTEM STUDY — ONE-LINE

CAD FILENAME	PRODUCT CODE	REVISION	G.O.	DWG	SHEET
PSE-10852	U0160	02	MPG03517	PSE-10852	2 OF 4



REVISION		
01	02	GENERAL REVISION E.CARPER 11-29-12

THE INFORMATION ON THIS DOCUMENT WAS CREATED BY EATON ELECTRICAL. IT WAS DISCLOSED IN CONFIDENCE AND IS ONLY TO BE USED FOR THE PURPOSE IN WHICH IT WAS SUPPLIED.

DFTR P.FILKO	DATE 8-03-11	EATON | Electrical Services & Systems	
ENGR E.CARPER	DATE 8-04-11	TITLE VA MEDICAL CENTER CLARKSBURG, WV	
SCALE NONE		TYPE POWER SYSTEM STUDY	ONE-LINE
CAD FILENAME PSE-10853	PRODUCT CODE U0160	REVISION 02	G.O. MPG03517
		DWG PSE-10853	SHEET 3 OF 4

CONTINUD FROM
ATS LS
DWG. PSE-10851

BKR LSSWBD
CUTLER-HAMMER
HMDL
800AS

LSSWBD
480V

F BHLSA
CUTLER-HAMMER
HKD
400AS

CBL-0116
1 - #500 , 375 ft

BKR BHLSA
CUTLER-HAMMER
KD
400AS

BHLSA
480V

F T-BLLSA
CUTLER-HAMMER
KD
350AS

CBL-0112
1 - #500 , 10 ft

F BHLSB
CUTLER-HAMMER
HKD
400AS

CBL-0136
1 - #500 , 250 ft

BKR BHLSB
CUTLER-HAMMER
KD
400AS

BHLSB
480V

F 1HLSB
CUTLER-HAMMER
FD
225AS

CBL-0137
1 - #1/0 , 20 ft

1HLSB
480V

F T-1LLSB
CUTLER-HAMMER
FD
200AS

CBL-0134
1 - #1/0 , 10 ft

T-1LLSB
75.0 kVA
Y/R 3.1561
480 / 208V
4.25% Z

CBL-0135
1 - #350 , 10 ft

F 3HLSB
CUTLER-HAMMER
FD
100AS

CBL-0147
1 - #1 , 80 ft

3HLSB
480V

F T-3LLSB
CUTLER-HAMMER
GHXE
70AS

CBL-0145
1 - #4 , 10 ft

T-3LLSB
30.0 kVA
Y/R 2.7250
480 / 208V
3.57% Z

CBL-0146
1 - #1 , 10 ft

BKR 3LLSB
CUTLER-HAMMER
EDB, EDS, 2 & 3 Pole
110AS

3LLSB
208V

F 3LLSD
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0148
1 - #3 , 150 ft

3LLSD
208V

F 4LLSB
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0149
1 - #1 , 20 ft

4LLSB
208V

CBL-0150
1 - #1 , 180 ft

4LLSD
208V

F 5HLSB
CUTLER-HAMMER
FD
100AS

CBL-0153
1 - #1 , 100 ft

5HLSB
480V

F T-5LLSB
CUTLER-HAMMER
FD
70AS

CBL-0151
1 - #4 , 10 ft

T-5LLSB
30.0 kVA
Y/R 2.7250
480 / 208V
3.57% Z

CBL-0152
1 - #1 , 10 ft

BKR 5LLSB
CUTLER-HAMMER
EDB, EDS, 2 & 3 Pole
100AS

5LLSB
208V

F 6LLSB
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0154
1 - #1 , 20 ft

6LLSB
208V

BKR 1LLSB
CUTLER-HAMMER
DK
300AS

1LLSB
208V

F BLLSB
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0138
1 - #1 , 20 ft

BLLSB
208V

CBL-0139
1 - #1 , 140 ft

BLLSG
208V

F 1LLSD
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0140
1 - #1 , 180 ft

1LLSD
208V

F 2LLSB
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0141
1 - #1 , 20 ft

2LLSB
208V

CBL-0142
1 - #1/0 , 150 ft

2LLSD
208V

T-BLLSA
150.0 kVA
Y/R 3.5856
480 / 208V
4.27% Z

CBL-0113
2 - #350 , 10 ft

BKR BLLSA
CUTLER-HAMMER
LG, Series G
600AS

BLLSA
208V

F BLLSF
CUTLER-HAMMER
EDB, EDS, 240V, 2 & 3 Pole
225AS

CBL-0114
1 - #4/0 , 180 ft

BLLSF
208V

F BLLSE
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0117
1 - #1 , 10 ft

BLLSE
208V

F BLEQC
CUTLER-HAMMER
EDB, EDS, 240V, 2 & 3 Pole
225AS

CBL-0118
1 - #4/0 , 290 ft

BLEQC
208V

CBL-0119
1 - #4/0 , 20 ft

BLEQD
208V

F 1LLSA
CUTLER-HAMMER
EDB, EDS, 240V, 2 & 3 Pole
225AS

CBL-0121
1 - #4/0 , 145 ft

F BLLSC
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0120
1 - #1 , 300 ft

BLLSC
208V

F BLLSD
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0115
1 - #1 , 55 ft

BLLSD
208V

F 3LLSA
CUTLER-HAMMER
EDB, EDS, 240V, 2 & 3 Pole
225AS

CBL-0126
1 - #4/0 , 165 ft

3LLSA
208V

F 3LLSC
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0127
1 - #1 , 210 ft

3LLSC
208V

CBL-0128
1 - #4/0 , 20 ft

4LLSA
208V

F 4LLSC
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0129
1 - #1 , 150 ft

4LLSC
208V

F EM 100
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0230
1 - 1 ft

EM 100
208V

F LP5C
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0131
1 - #1 , 90 ft

LP5C
208V

F 5LLSA
CUTLER-HAMMER
EDB, EDS, 240V, 2 & 3 Pole
225AS

CBL-0130
1 - #4/0 , 185 ft

5LLSA
208V

CBL-0132
1 - #4/0 , 20 ft

6LLSA
208V

F LP6C
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0133
1 - #1 , 70 ft

LP6C
208V

F 1LLSC
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0125
1 - #1 , 180 ft

1LLSC
208V

F 1WCLS
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0122
1 - #1 , 250 ft

1WCLS
208V

CBL-0123
1 - #4/0 , 20 ft

2LLSA
208V

F 2LLSC
CUTLER-HAMMER
BAB, 3-Pole
100AS

CBL-0124
1 - #1 , 200 ft

2LLSC
208V

CONTINUD FROM
F BHNB
DWG. PSE-10851

BKR BHNB
CUTLER-HAMMER
NQ_ENG 310
1200AS / Plug 1200.0 A

BHNB
480V

F 1HNB
CUTLER-HAMMER
KD
400AS

CBL-0178
1 - #500 , 20 ft

1 HNB
480V

F T-1NB
CUTLER-HAMMER
KD
350AS

CBL-0176
1 - #500 , 10 ft

T-1LNB
150.0 kVA
Y/R 3.5856
480 / 208V
4.27% Z

CBL-0177
2 - #350 , 10 ft

BKR 1LNB
CUTLER-HAMMER
LG, Series G
600AS

1LNB
208V

F 1LNC
CUTLER-HAMMER
EDB, EDS, 2 & 3 Pole
150AS

CBL-0179
1 - #1/0 , 180 ft

1LNC
208V

F 3HNB
CUTLER-HAMMER
KD
400AS

CBL-0187
1 - #500 , 60 ft

3HNB
480V

F T-3NB
CUTLER-HAMMER
FD
110AS

CBL-0185
1 - #1 , 10 ft

T-3LNB
45.0 kVA
Y/R 2.9004
480 / 208V
4.84% Z

CBL-0186
1 - #1/0 , 10 ft

BKR 3LNB
CUTLER-HAMMER
EDB, EDS, 2 & 3 Pole
175AS

3LNB
208V

BLNF
208V

F 4HNB
CUTLER-HAMMER
KD
400AS

CBL-0190
1 - #500 , 80 ft

4HNB
480V

F T-4NB
CUTLER-HAMMER
FD
110AS

CBL-0188
1 - #1 , 10 ft

T-4LNB
45.0 kVA
Y/R 2.9004
480 / 208V
4.84% Z

CBL-0189
1 - #1/0 , 10 ft

BKR 4LNB
CUTLER-HAMMER
EDB, EDS, 2 & 3 Pole
175AS

4LNB
208V

BCH 2HNB
CUTLER-HAMMER
JD
70AS

F 2HNB
CUTLER-HAMMER
KD
400AS

CBL-0183
1 - #500 , 40 ft

2HNB
480V

F T-2NB
CUTLER-HAMMER
JD
100AS

CBL-0181
1 - #1 , 10 ft

T-2LNB
45.0 kVA
Y/R 2.9004
480 / 208V
4.84% Z

CBL-0182
1 - #1/0 , 10 ft

BKR 2LNB
CUTLER-HAMMER
EDB, EDS, 2 & 3 Pole
175AS

2LNB
208V

F PNL RM 2171
CUTLER-HAMMER
BAB, 3-Pole
60AS

CBL-0184
1 - #1 , 10 ft

PNL RM 2171
208V

F5HNB
CUTLER-HAMMER
KD
400AS

CBL-0193
1 - #500 , 100 ft

5HNB
480V

F T-5 LNB
CUTLER-HAMMER
FD
110AS

CBL-0191
1 - #1 , 10 ft

T-5LNB
45.0 kVA
Y/R 2.9004
480 / 208V
4.84% Z

CBL-0192
1 - #1/0 , 10 ft

BKR 5LNB
CUTLER-HAMMER
EDB, EDS, 2 & 3 Pole
175AS

5LNB
208V

F 6HNB
CUTLER-HAMMER
KD
400AS

CBL-0196
1 - #500 , 120 ft

6HNB
480V

F T-6NB
CUTLER-HAMMER
FD
110AS

CBL-0194
1 - #1 , 10 ft

T-6LNB
45.0 kVA
Y/R 2.9004
480 / 208V
4.84% Z

CBL-0195
1 - #1/0 , 10 ft

BKR 6LNB
CUTLER-HAMMER
EDB, EDS, 2 & 3 Pole
175AS

6LNB
208V

REVISION		
01	02	
GENERAL REVISION E.CARPER 11-29-12		

DFTR	DATE
P.FILKO	8-03-11
ENGR	DATE
E.CARPER	8-04-11
SCALE	
NONE	
CAD FILENAME	PRODUCT CODE
PSE-10854	U0160
REVISION	
02	

EATON | Electrical Services & Systems

TITLE: VA MEDICAL CENTER
CLARKSBURG, WV

TYPE: POWER SYSTEM STUDY — ONE-LINE

G.O.: MPG03517

DWG: PSE-10854

SHEET 4 OF 4