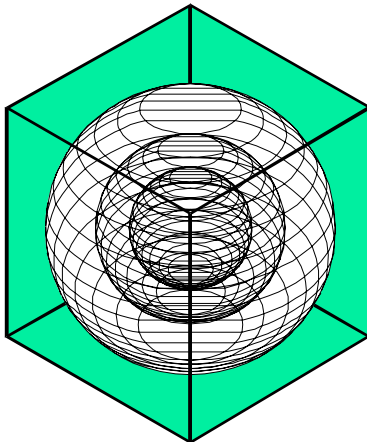


BASELINE REPORT FOR THE FORT HOOD ARMY BASE: SEPTEMBER 2003 TO OCTOBER 2004

A Research Project for the U.S. Army C.E.R.L.
and the Ft. Hood Energy Office

Jeff S. Haberl, Ph.D., P.E.
Zi Liu

December 2004



**ENERGY SYSTEMS
LABORATORY**

Texas Engineering Experiment Station
Texas A&M University System

PREFACE

This report is the 2003/2004 baseline report for a multi-year Research Project performed for the U.S. Army Construction Engineering Research Laboratory, and the Ft. Hood Energy Office. This project was carried out in several phases. The first phase included the development of a Preliminary Monitoring and Analysis Plan (PreMAP), and the purchase and the installation of data monitoring equipment, which was delivered in the Spring of 2001. The data recorded for the buildings (logger data), as well as the whole-base natural gas use are also reported in this report.

In 2001, additional data loggers were installed in the main and west-base electrical substations, and a steam/temperature channel was installed in the thermal plant. Installation of the III Corp building was also initiated in November of 2001 and completed in 2002. The data from Central Thermal Power Plant (87000), III Corp building, Darnall Hospital¹, Main Substation, West Substation, and North Substation are plotted and reported in this report.

Finally, a CDROM has been prepared to accompany this report that contains all data collected at Ft. Hood for the period September 2003 through October 2004. The files on the CDROM include all the data (in ASCII format) from the ESL's database that was collected from Ft. Hood, and all analysis files used in this report.

¹ These data are from a separate contract to perform Continuous Commissioning for the Darnall Hospital.

ABSTRACT

This report presents electricity, natural gas and cooling baselines for the Thermal Plant, III Corp building, Darnall Hospital, Main Substation, West Substation, and North Substation.

The baselines developed for this report include data measured during the period from September 2003 through October 2004. The energy consumption data are presented in time series plots or scatter plots versus ambient temperature. Baseline are also presented for the natural gas consumption for the Ft. Hood Army base and for individual channels and groups of channels that represent loads determined to be of value to Ft. Hood.

An appendix is also provided that includes information about ESL's Channel Identification Tables, data logger parameter sets, and includes a list of data files in the CDROM that accompanies this report.

ACKNOWLEDGEMENTS

This project would not have been possible without the support that was provided by Dave Schwenk (USACERL), David Underwood (USACERL), and Bobby Lynn, Danny Shaff and Myron Cook (Ft. Hood Energy Office). Thanks also to the following individuals who helped keep the computers running, the data flowing, and the printers printing at the ESL, including: Mr. Jim Sweeney, Mr. Peter Klima, and Mr. Stephen O'Neal, and thanks to Yong Hoon Song, Sopa Visitsak, Soolyeon Cho and Suwon Song for providing weekly inspection plots. Thanks also to Ms. Shelly Price (SiTEX), and Mr. John McBride (NHT) who diligently installed the monitoring equipment under contract to the Energy Systems Laboratory (ESL). Thanks also to Mr. Brandon Dooley, Mr. Kelly Milligan, Mr. Mike Davis, and Ms. Tehesia Powell for assistance coordinating the metering equipment installation.

TABLE OF CONTENTS

PREFACE.....	1
ACKNOWLEDGEMENTS	3
1. INTRODUCTION.....	6
2. Data Collection	6
2.1. 87000 Block Thermal Plant.....	6
2.2. III Corp Building.....	10
2.3. Darnall Hospital	12
2.4. Main Electrical Substation	17
2.5. West Electrical Substation	21
2.6. North Fort Hood Substation	25
3. DATA COLLECTED DURING THE PERIOD SEPTEMBER 2003 TO OCTOBER 2004.	26
3.1. Loggers reported on in this report.	26
3.2. Data collected in this report.	26
3.2.1. Logger #938 - 3279 - Ft Hood - Central Thermal Power Plant (87000)	26
3.2.1.1. Electricity use monitoring	26
3.2.1.2. Thermal energy use monitoring	26
3.2.1.3. Ambient conditions monitoring	27
3.2.1.4. Chiller monitoring	27
3.2.1.5. Natural gas monitoring.....	27
3.2.2. Logger: #947 - 10043 - III Corp Building.....	27
3.2.3. Loggers: #939 - 3832 - Darnall Hospital #1 and #940 - 3831 - Darnall Hospital #2	28
3.2.4. Loggers: #941 - 10147 - Main Electrical Substation #1, #946 - 10148 - Main Electrical Substation #2 and #948 - 10149 - Main Electrical Substation #3	28
3.2.5. Loggers: #944 - 10076 - West Electrical Substation #1 and #949 - 10150 - West Electrical Substation #2	28
3.2.6. Loggers: #937 - 10146 - North Electrical Substation.....	28
4. WHOLE-BASE NATURAL GAS ANALYSIS	42
5. APPENDIX I ESL POLLING AND DATABASE INFORMATION	50
5.1. Channel Identification Tables lstarxp% listchid #938 - 3279 - Ft Hood - Central Thermal Power Plant (87000).....	50
5.2. Parameter set for the Logger #938 - 3279 - Ft Hood - Central Thermal Power Plant (87000)	51
5.3. Channel Identification Tables lstarxp% listchid #947 - 10043 - III Corps	55
5.4. Parameter set for the Logger #947 - 10043 - III Corps	56
5.5. Channel Identification Tables lstarxp% listchid# 939 - 3832 - Darnall Hospital #1	60
5.6. Parameter set for the Logger # 939 - 3832 - Darnall Hospital #1	61
5.7. Channel Identification Tables lstarxp% listchid# 940 - 3831 - Darnall Hospital #2	64
5.8. Parameter set for the Logger # 940 - 3831 - Darnall Hospital #2	65
5.9. Channel Identification Tables lstarxp% listchid#941 - 10147 - Main Electrical Substation #1	69
5.10. Parameter set for the Logger #941 - 10147 - Main Electrical Substation #1	71
5.11. Channel Identification Tables lstarxp% listchid#946 - 10148 - Main Electrical Substation #2	75
5.12. Parameter set for the Logger #946 - 10148 - Main Electrical Substation #2	77
5.13. Channel Identification Tables lstarxp% listchid#948 - 10149 - Central Elect Power Plant (Main Substation #3)	81
5.14. Parameter set for the Logger #948 - 10149 - Central Elect Power Plant (Main Substation #3).....	83
5.15. Channel Identification Tables lstarxp% listchid #949 - 10150 - Ft Hood West Substation	87
5.16. Parameter set for the Logger #949 - 10150 - Ft Hood West Substation.....	88
5.17. Channel Identification Tables lstarxp% listchid#944 - 10076 Ft Hood - Clear Creek Substation	92
5.18. Parameter set for the Logger #944 - 10076 Ft Hood - Clear Creek Substation.....	93
5.19. Channel Identification Tables lstarxp% listchid#937 - 10146 North Electrical Substation	97
5.20. Parameter set for the Logger #937 - 10146 North Electrical Substation.....	98
6. APPENDIX II LIST OF DATA FILES	102

LIST OF FIGURES

Figure 2.1-1: Electrical Monitoring Diagram for 87000 Block Thermal Plant.....	7
Figure 2.1-2: Ambient Conditions Monitored at 87000 Block Thermal Plant.....	8
Figure 2.1-3: Thermal Monitoring Diagram for 87000 Block Thermal Plant.....	9
Figure 2.2-1: Electrical Monitoring Diagram for III Corp Building	10
Figure 2.2-2: Thermal Monitoring Diagram for III Corps	11
Figure 2.3-1: Electrical Monitoring Diagram for Darnall Hospital.....	13
Figure 2.3-2: Electrical Monitoring Diagram for Darnall Hospital.....	14
Figure 2.3-3: Thermal Monitoring Diagram for Darnall Hospital	15
Figure 2.3-4: Thermal Monitoring Diagram for Darnall Hospital	16
Figure 2.4-1: Electrical Monitoring Diagram for Main Electrical Substation (Logger #941).....	18
Figure 2.4-2: Electrical Monitoring Diagram for Main Electrical Substation (Logger #946).....	19
Figure 2.4-3: Electrical Monitoring Diagram for Main Electrical Substation (Logger #948).....	20
Figure 2.5-1: Electrical Monitoring Diagram for West Electrical Substation (Logger #944).....	22
Figure 2.5-2: Electrical Monitoring Diagram for West Electrical Substation (Logger #949).....	23
Figure 2.5-3: Ambient Conditions Monitored at West Electrical Substation (Logger #949).....	24
Figure 2.6-1: Electrical Monitoring Diagram for North Electrical Substation.....	25
Figure 3.2-1: 87000 Block Thermal Plant Electricity Use: Total, Chiller & Pump Use.....	29
Figure 3.2-2: 87000 Block Thermal Plant Gas use and Chilled Water Production.....	30
Figure 3.2-3: 87000 Block Thermal Plant Ambient Conditions.	31
Figure 3.2-4: 87000 Block Thermal Plant Measured Ambient Conditions vs NWS Ambient Conditions (Waco): Temperature and Humidity.	32
Figure 3.2-5: 87000 Block Thermal Plant Chiller Monitoring Flow, and Supply and Return Temperatures.	33
Figure 3.2-6: 87000 Block Thermal Plant Chiller Electricity Use vs. Ambient Conditions (hourly data).....	34
Figure 3.2-7: 87000 Block Thermal Plant Chilled Water Production vs Ambient Conditions (hourly data).....	34
Figure 3.2-8: 87000 Block Thermal Plant Natural Gas Consumption vs Ambient Conditions (hourly data).....	35
Figure 3.2-9: III Corp Electricity Use: Whole-building, Chiller and MCC Use.	36
Figure 3.2-10: III Corp Natural Gas Use.....	37
Figure 3.2-11: III Corp Natural Gas Use vs Temperature.....	37
Figure 3.2-12: III Corp Chiller Electricity Use vs Temperature.	38
Figure 3.2-13: Darnall Hospital Electricity Use: Total, Chiller Electricity and MCC Use.	39
Figure 3.2-14: Darnall Hospital Electricity Use -Small MCC Use.	40
Figure 3.2-15: Darnall Hospital Natural Gas Use.	40
Figure 3.2-16: Main Electrical Substation Electricity Use.....	41
Figure 3.2-17: West Electrical Substation Electricity Use.....	41
Figure 3.2-18: North Electrical Substation Electricity Use.....	41
Figure 4-1: 2003 and 2004 Daily Gas Use for West Meters.	42
Figure 4-2: 2003 and 2004 Daily Gas Use for South Meters.	43
Figure 4-3: 2003 and 2004 Daily Gas Use for North Meters.	44
Figure 4-4: 2003 and 2004 Daily Gas Use for All Meters.	45
Figure 4-5: 2003 and 2004 Daily Gas Use for West Meter vs Temperature.	46
Figure 4-6: 2003 and 2004 Daily Gas Use for South Meter vs Temperature.....	47
Figure 4-7: 2003 and 2004 Daily Gas Use for North Meter vs Temperature.....	48
Figure 4-8: 2003 and 2004 Daily Gas Use for All Meters vs Temperature.	49
Figure 6-1 Organization of Files on the Accompanying CDROM.	102

1. INTRODUCTION

This report presents the electricity, natural gas and cooling data for the thermal plant, III Corp building, Darnall hospital, main, west and north substations at Ft. Hood. Data are also presented for the natural gas consumption for the Ft. Hood Army base. The data in this report include data measured during the period September 2003 to October 2004.

2. Data Collection

2.1. 87000 Block Thermal Plant

In order to provide Ft. Hood with baseline models of the 87000 block one data logger was installed in 2001 in the thermal plant. This section of the report contains the electrical and thermal monitoring diagrams for the loggers that were installed. Appendix I contains the logger parameter sets that are used to configure the logger.

The electrical loads for logger #938 are shown in Figure 2.1-1. These loads include the main electric loads on CT0, CT1 and CT2, and the chiller sub metering on CT3, CT4, CT5 and CT6. The ambient conditions monitored by logger #938 are shown in Figure 2.1-2, which include the ambient temperature and relative humidity. The thermal loads monitored by Logger #938 are shown in Figure 2.1-3, and includes the chilled water flow, and chilled water supply and return temperatures for chillers 1 and 2, and the natural gas used by the plant.

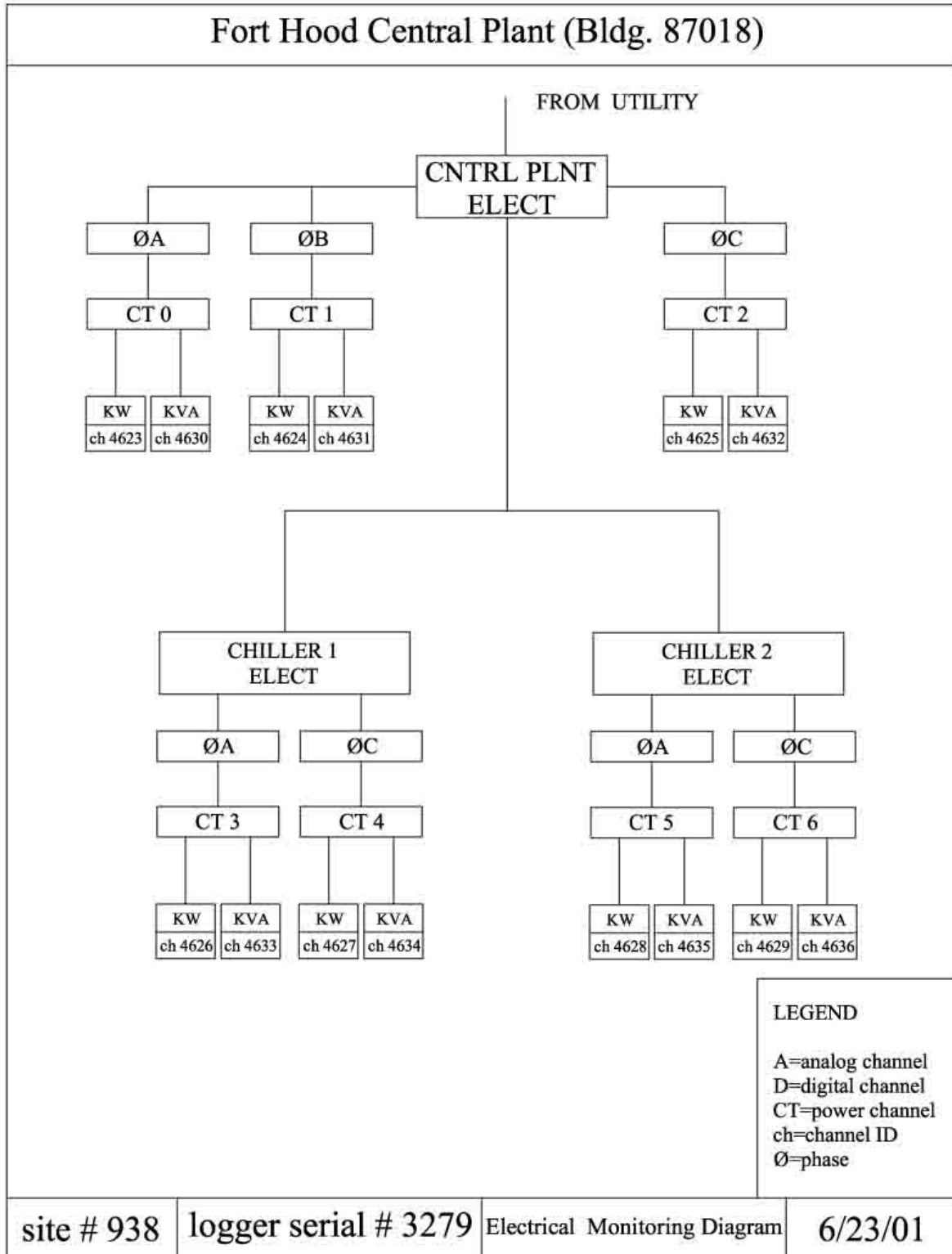


Figure 2.1-1: Electrical Monitoring Diagram for 87000 Block Thermal Plant

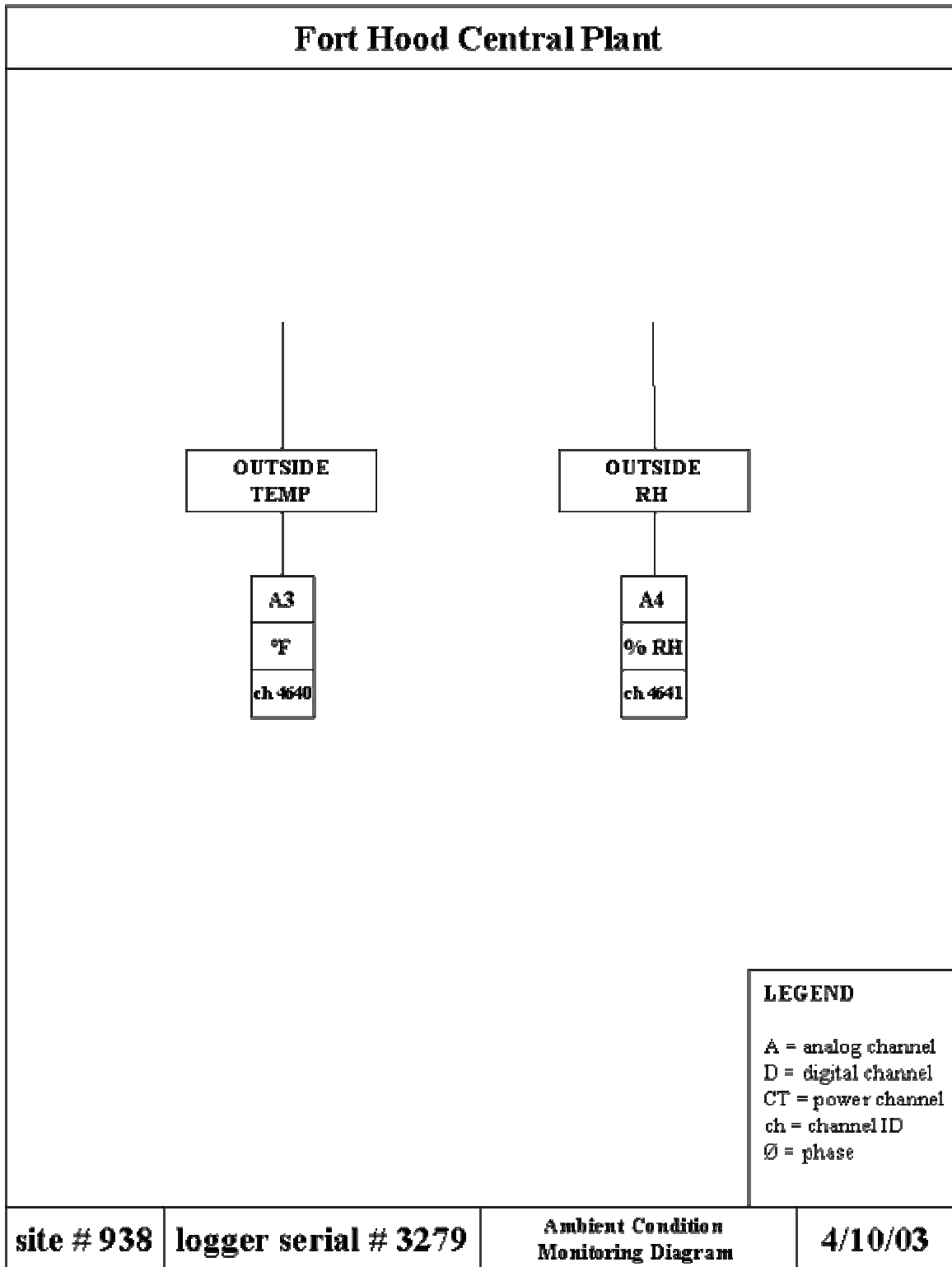


Figure 2.1-2: Ambient Conditions Monitored at 87000 Block Thermal Plant

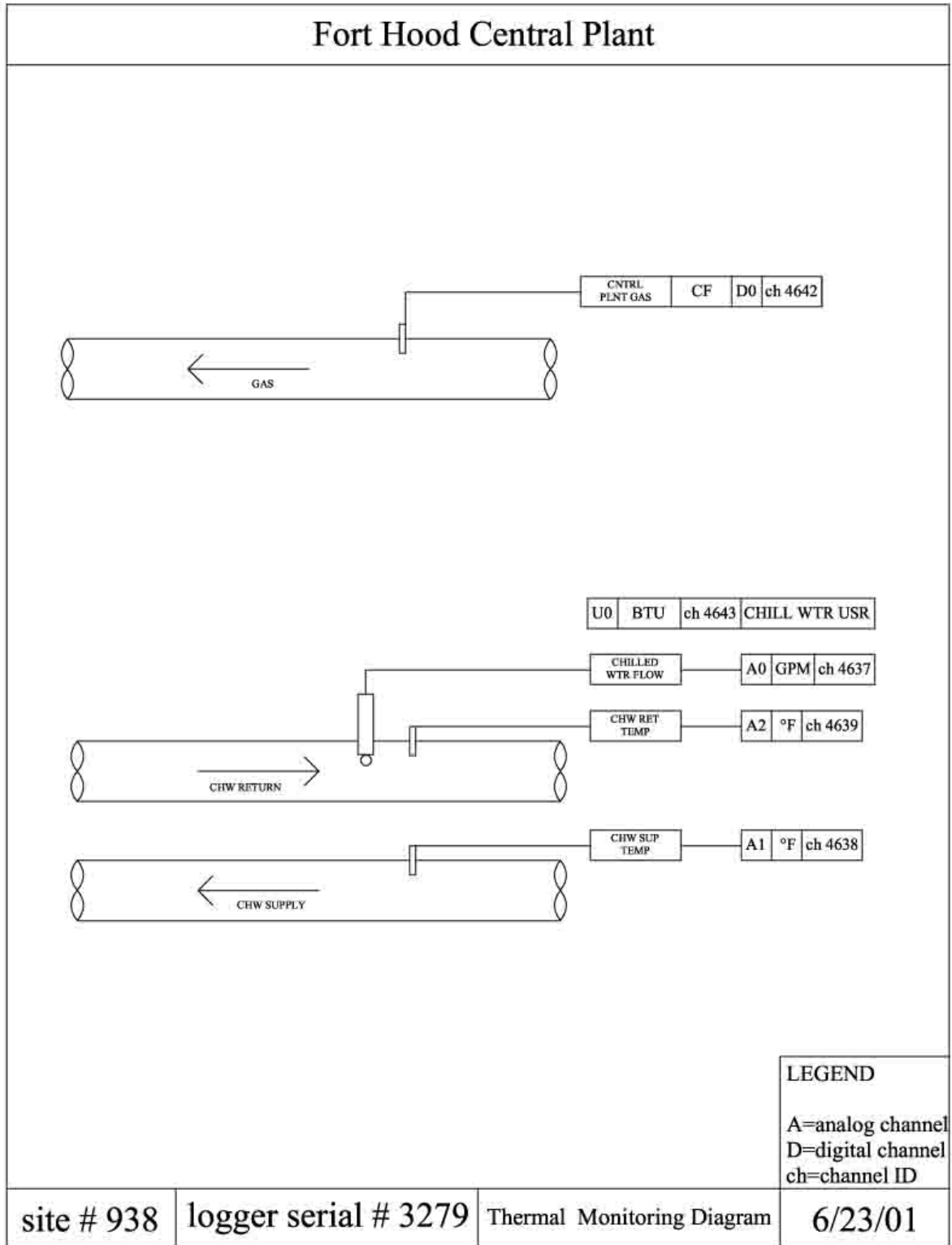


Figure 2.1-3: Thermal Monitoring Diagram for 87000 Block Thermal Plant

2.2. III Corp Building

This section of the report contains the electrical and thermal monitoring diagrams for the logger that was installed in III Corp Building. Appendix I contains the logger parameter set that is used to configure the logger.

The electrical loads for logger #947 are shown in Figure 2.2-1. These loads include the main electric loads on CT0, CT1, CT2, CT3, CT4, and CT5, the chiller submetering on CT6, CT7, CT8, CT9, CT10, CT11, CT12 and CT13, and MCC submetering on CT14 and CT15. The thermal loads monitored by Logger #947 are shown in Figure 2.2-2 and include the natural gas used by the plant.

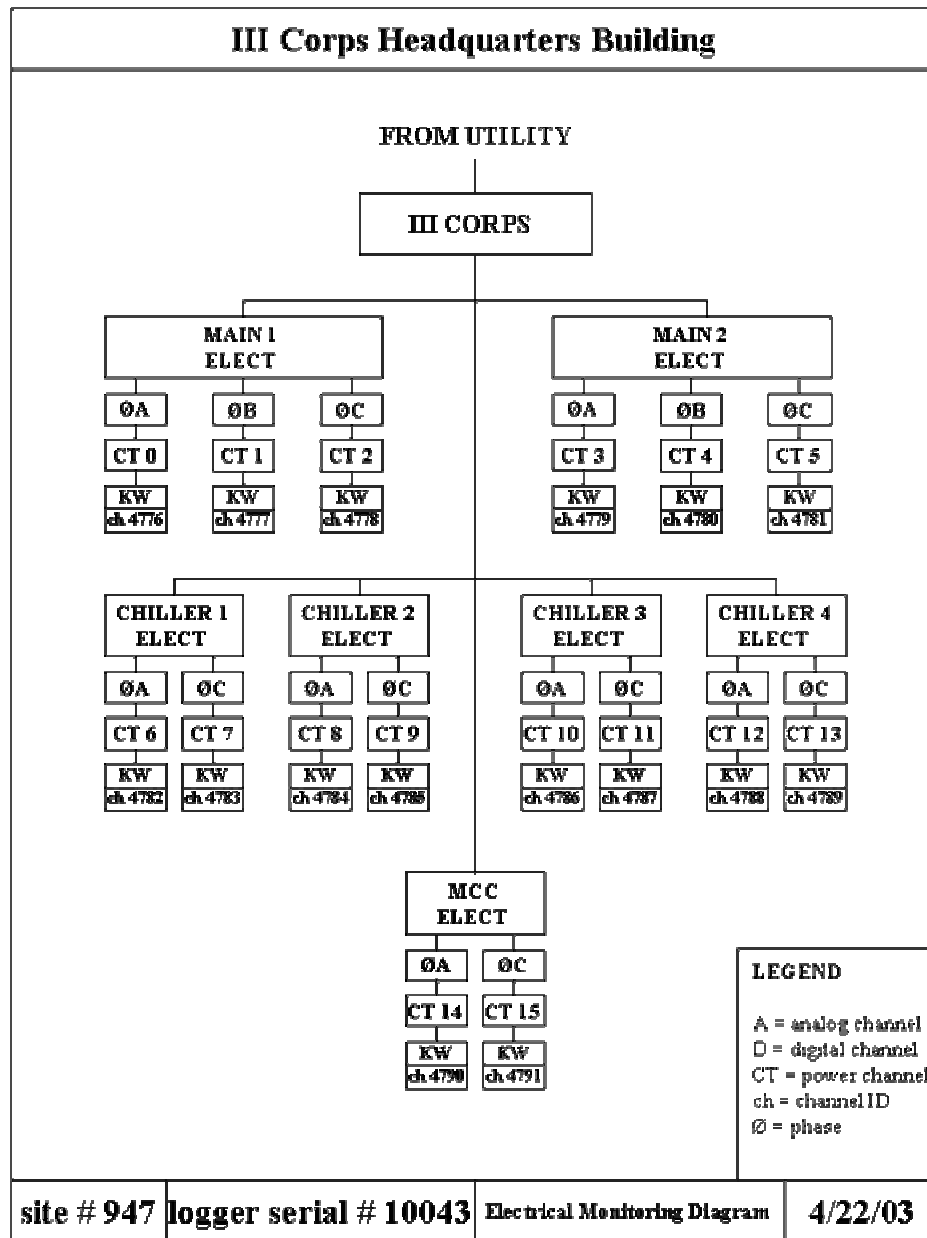


Figure 2.2-1: Electrical Monitoring Diagram for III Corp Building

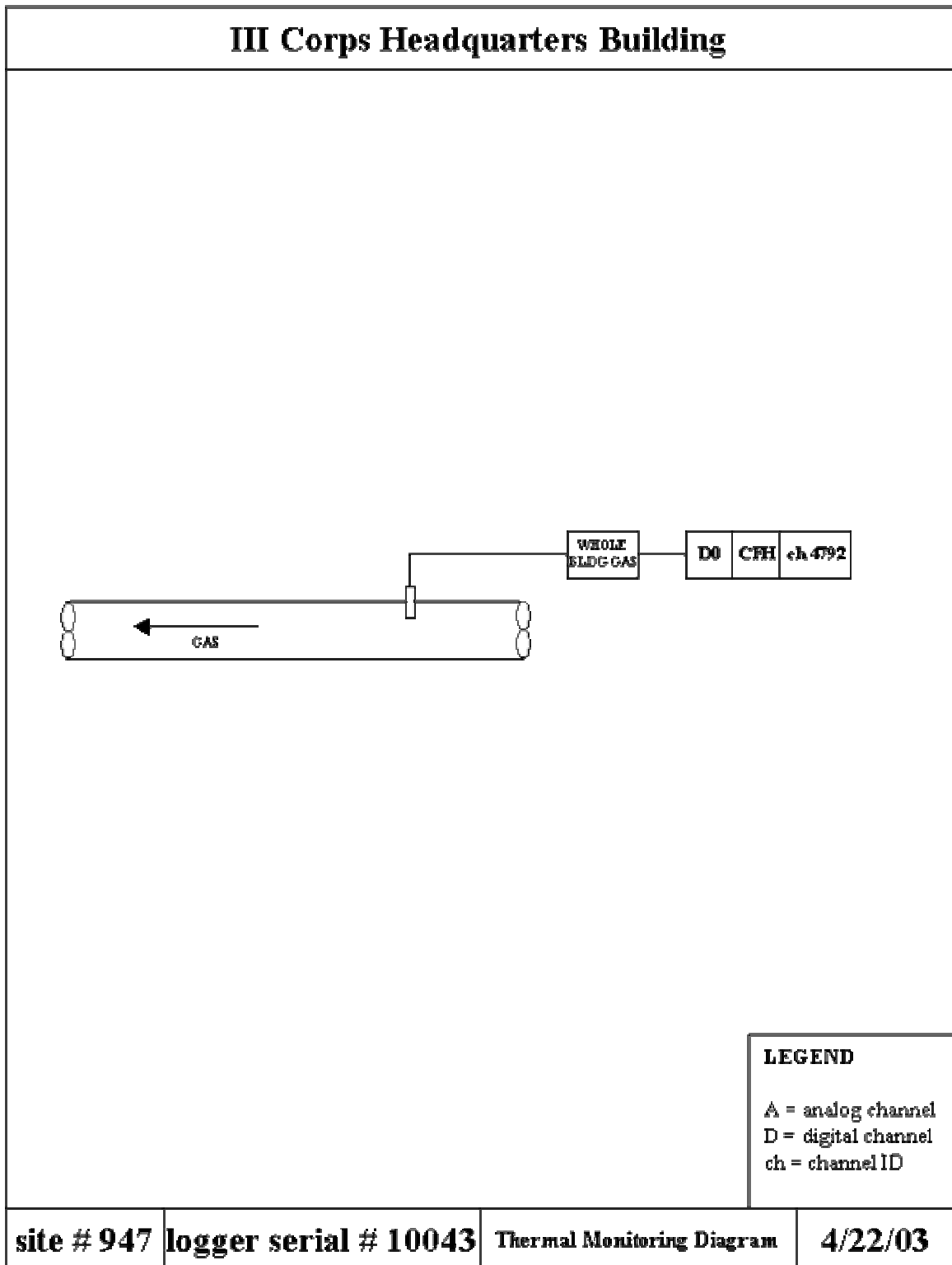


Figure 2.2-2: Thermal Monitoring Diagram for III Corps

2.3. Darnall Hospital

In order to provide Ft. Hood with baseline models of the Darnall Hospital two data loggers were installed. This section of the report contains the electrical and thermal monitoring diagrams for the loggers that were installed. Appendix I contains the logger parameter sets that are used to configure the logger.

The electrical loads for logger #940 are shown in Figure 2.3-1. These loads include the main electric loads of Darnall Hospital whole-building electricity meter #1 and #2 on D0 and D1, the chiller sub metering on CT0, CT1, CT2, CT3, CT4, and CT5, and MCC sub metering on CT6, CT7, CT8, and CT9. The electrical loads for logger #939 are shown in Figure 2.3-2. These loads include the main electric loads of Darnall Hospital whole-building electricity meter #3 and #4 on D0 and D1. The thermal loads monitored by Logger #940 are shown in Figure 2.3-3 and Figure 2.3-4, including the chilled water supply and return temperatures for chillers 1, 2, and 3, and the natural gas used by the boiler and other natural gas use in Darnall Hospital.

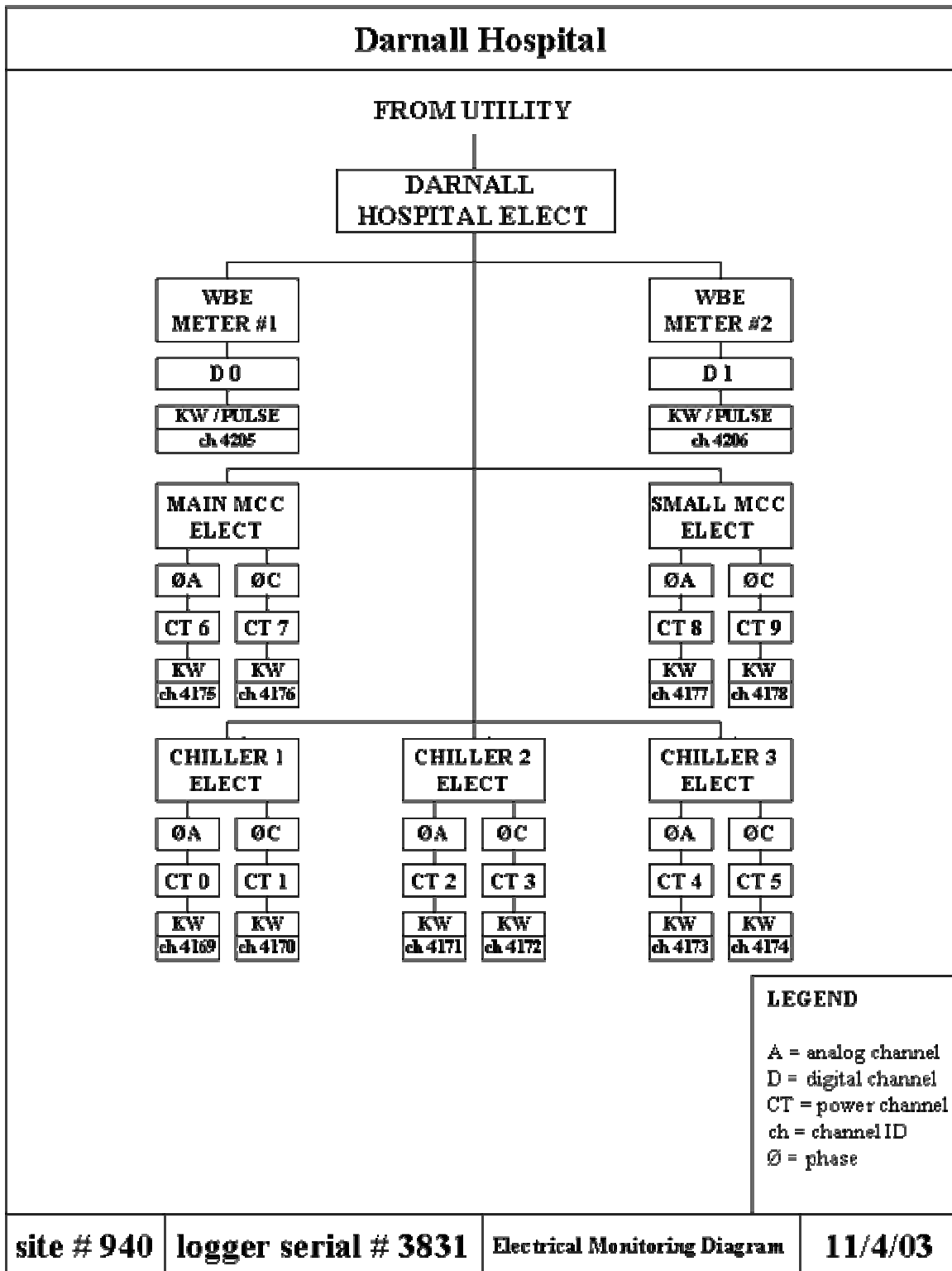


Figure 2.3-1: Electrical Monitoring Diagram for Darnall Hospital

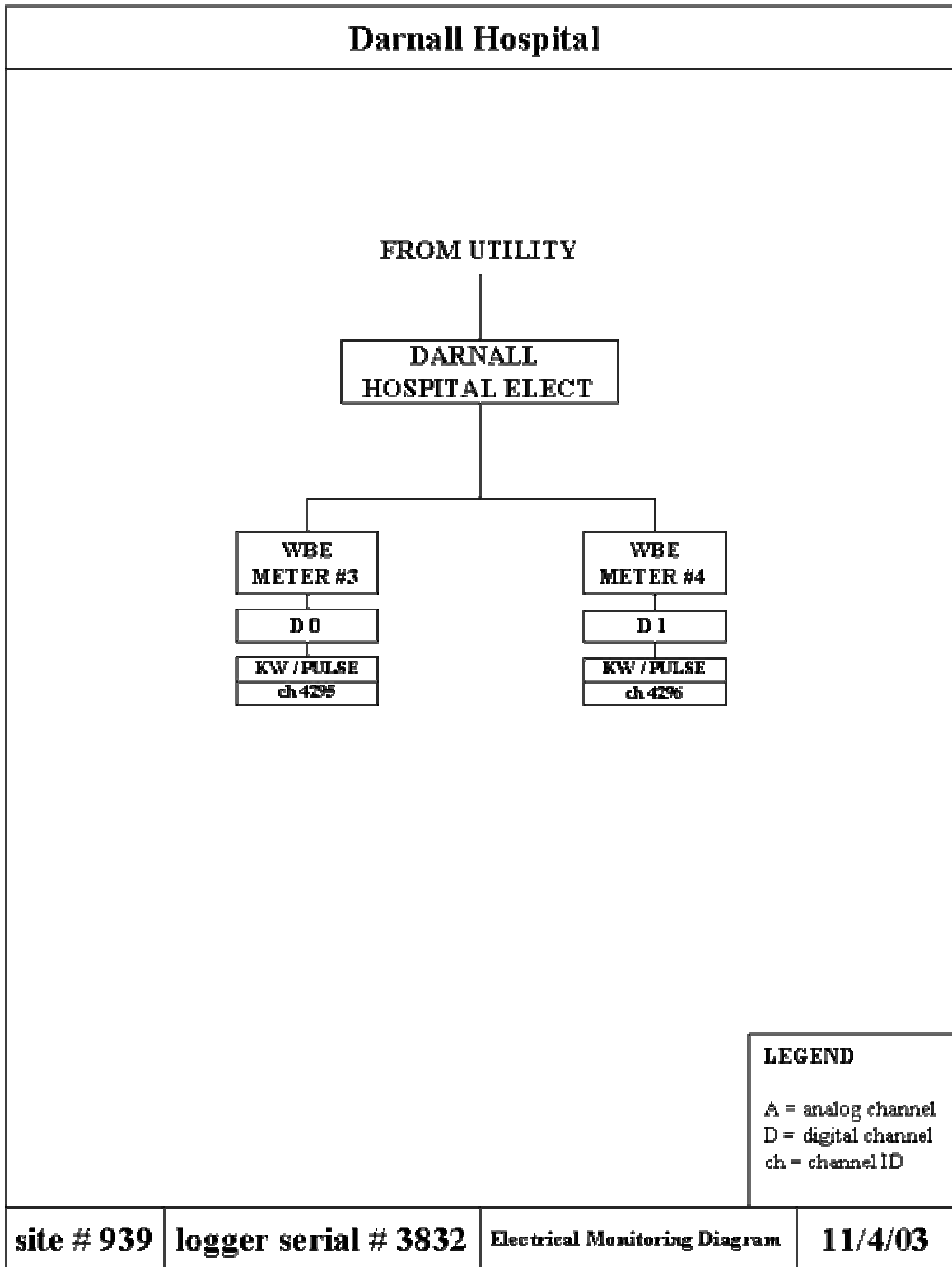


Figure 2.3-2: Electrical Monitoring Diagram for Darnall Hospital

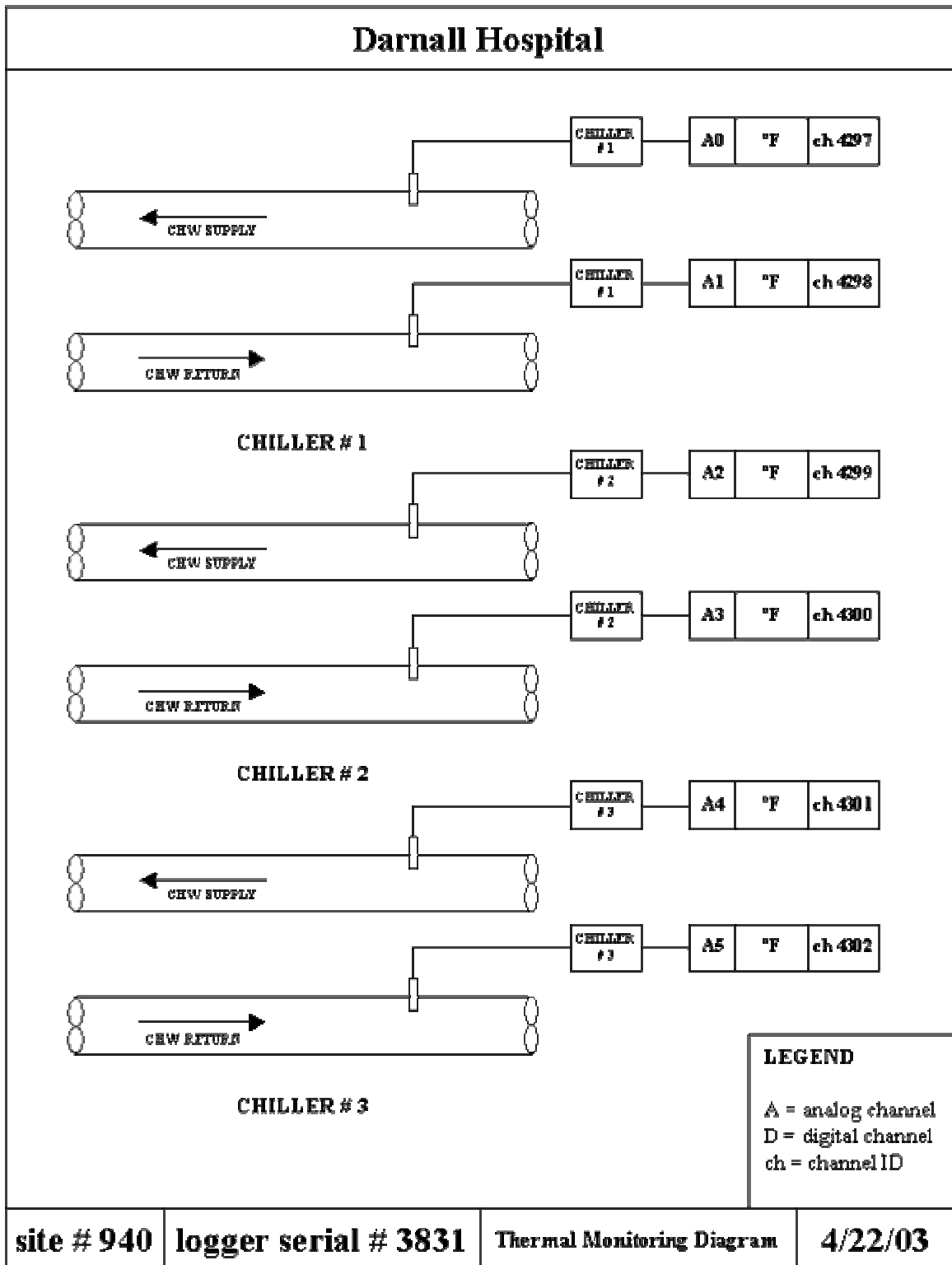


Figure 2.3-3: Thermal Monitoring Diagram for Darnall Hospital

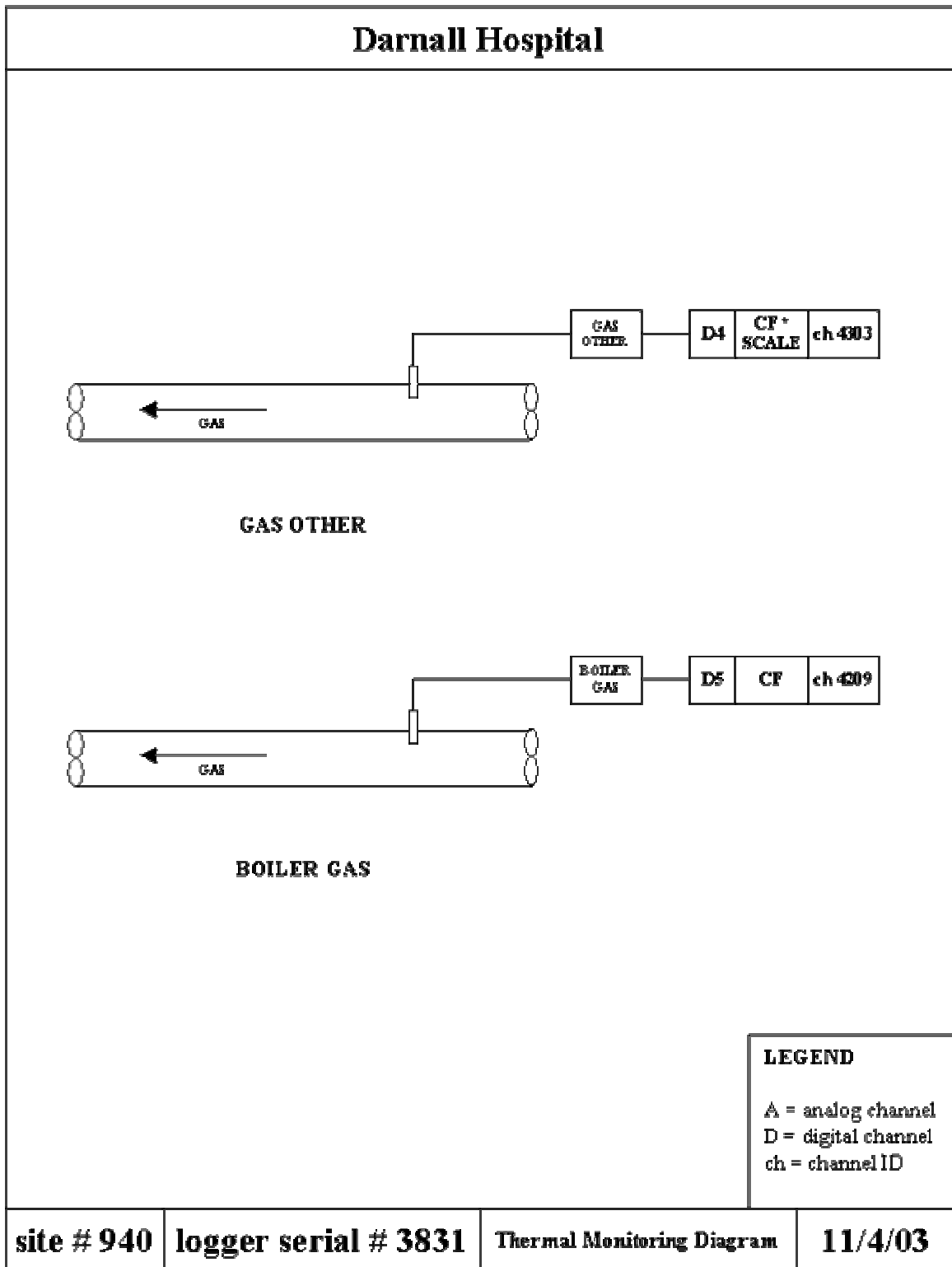


Figure 2.3-4: Thermal Monitoring Diagram for Darnall Hospital

2.4. Main Electrical Substation

Three data loggers were installed in the Main Electrical Substation and this section of the report contains the electrical and thermal monitoring diagrams for the loggers that were installed. Appendix I contains the logger parameter sets that are used to configure the logger.

The electrical loads for logger #941 are shown in Figure 2.4-1. These loads include the main electric loads of the circuit breaker #5 on CT0, CT1 and CT2, the circuit breaker #4 on CT3, CT4, and CT5, the circuit breaker #8 on CT6, CT7 and CT8, the circuit breaker #15 on CT9, CT10, and CT11, the circuit breaker #12 on CT12, CT13, and CT14, and the circuit breaker #3 on CT15.

The electrical loads for logger #946 are shown in Figure 2.4-2. These loads include the main electric loads of the circuit breaker #3 on CT0 and CT1, the circuit breaker #10 on CT2, CT3, and CT4, the circuit breaker #2 on CT5, CT6 and CT7, the circuit breaker #11 on CT8, CT9, and CT10, the circuit breaker #9 on CT11, CT12, and CT13, and the circuit breaker #13 on CT14 and CT15.

The electrical loads for logger #948 are shown in Figure 2.4-3. These loads include the main electric loads of the circuit breaker #13 on CT0, the circuit breaker #1 on CT1, CT2, and CT3, the circuit breaker #6 on CT4, CT5 and CT6, the circuit breaker #7 on CT7, CT8, and CT9, the circuit breaker #14 on CT10, CT11, and CT12, and the circuit breaker #16 on CT13, CT14 and CT15.

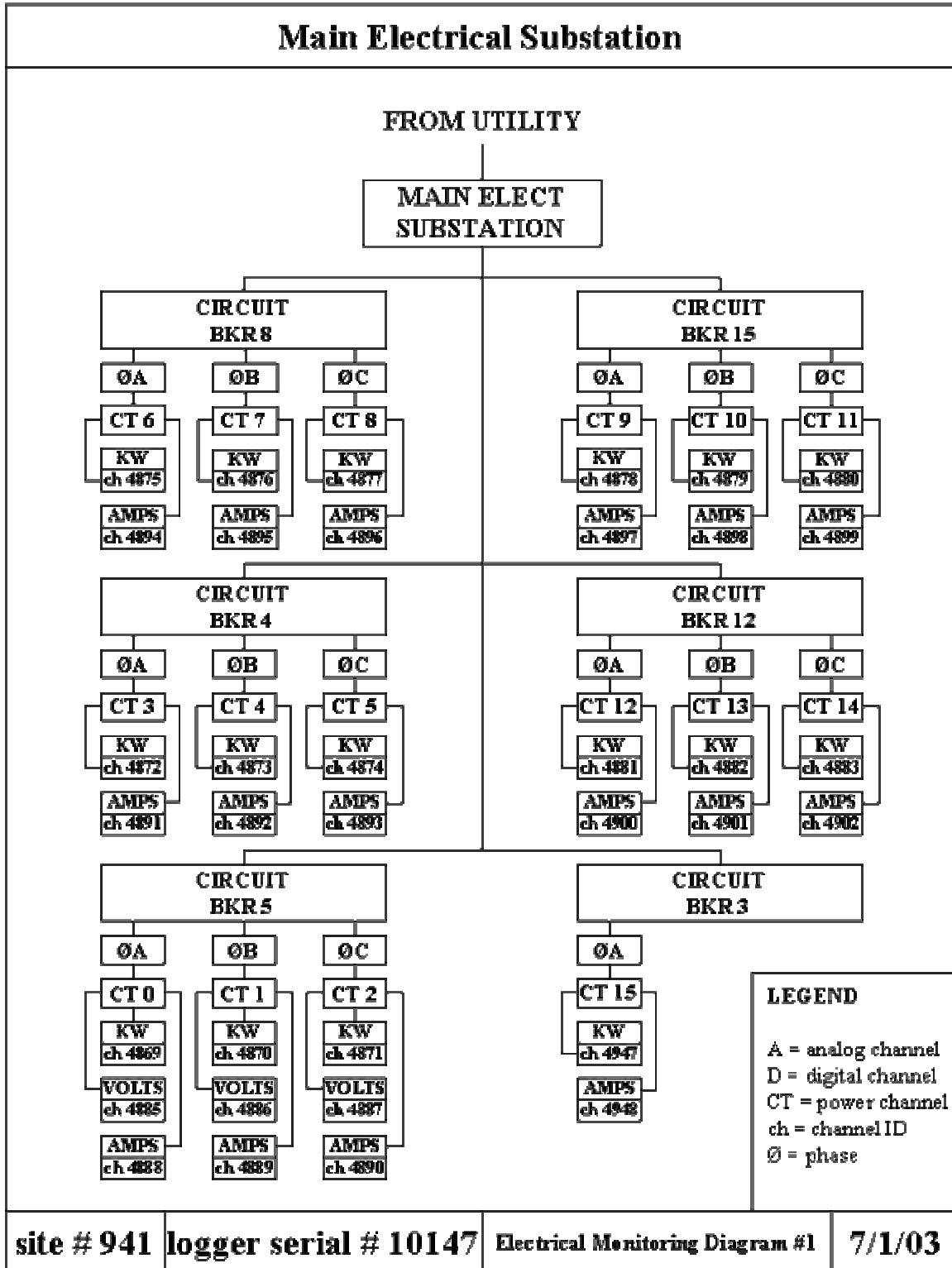


Figure 2.4-1: Electrical Monitoring Diagram for Main Electrical Substation (Logger #941)

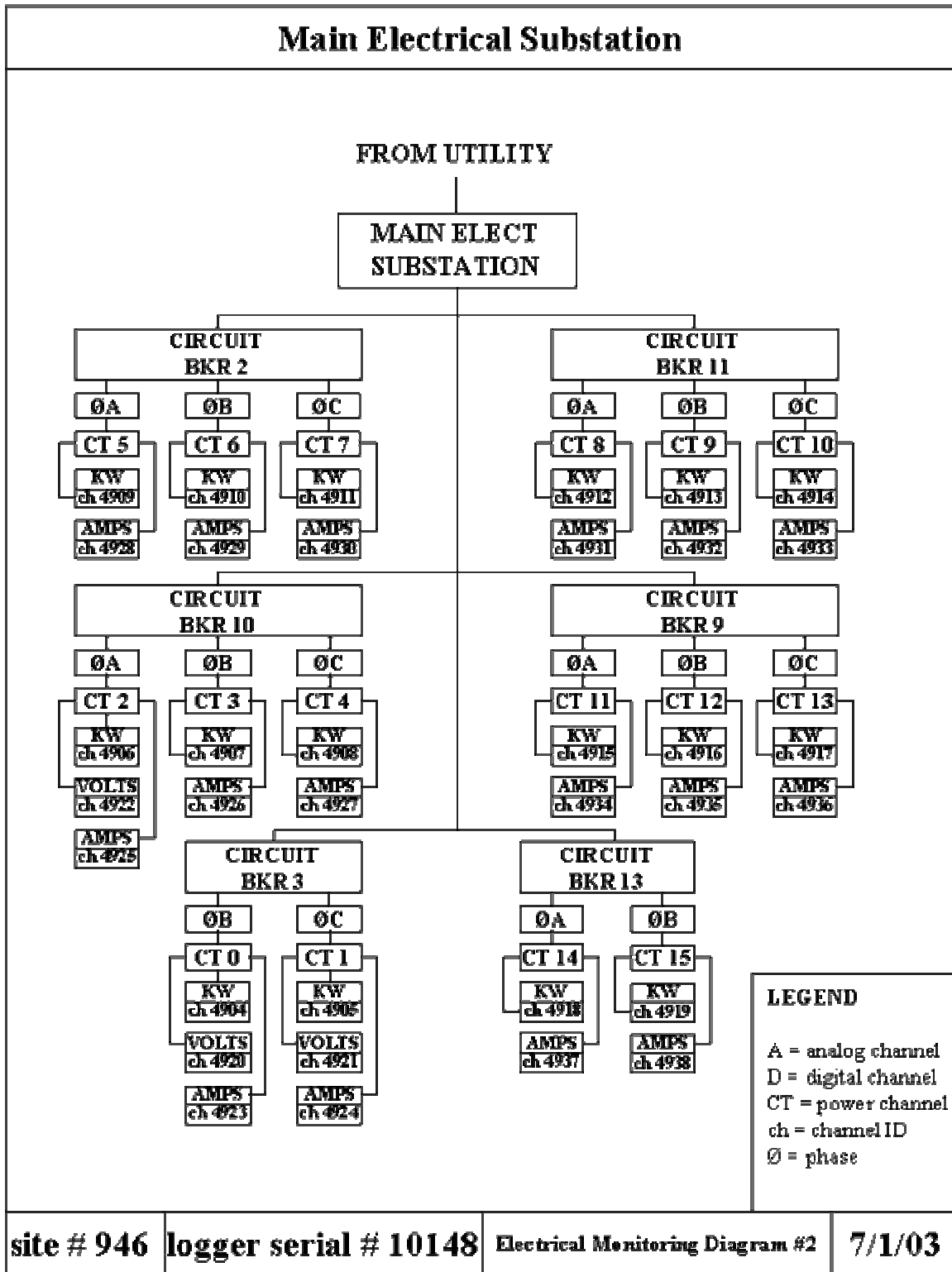


Figure 2.4-2: Electrical Monitoring Diagram for Main Electrical Substation (Logger #946)

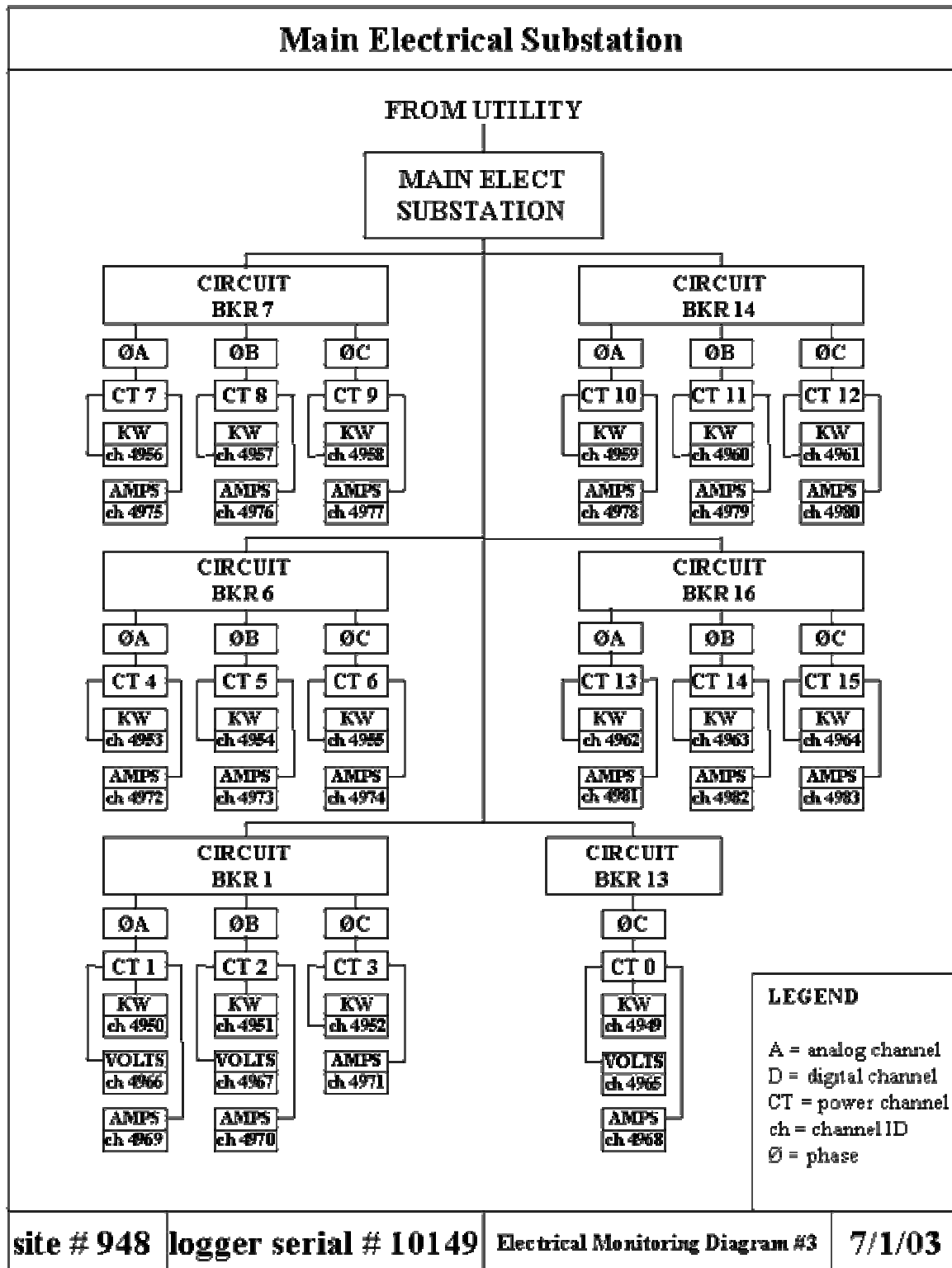


Figure 2.4-3: Electrical Monitoring Diagram for Main Electrical Substation (Logger #948)

2.5. West Electrical Substation

Three data loggers were installed in the Main Electrical Substation and this section of the report contains the electrical and thermal monitoring diagrams for the loggers that were installed. Appendix I contains the logger parameter sets that are used to configure the logger.

The electrical loads for logger #941 are shown in Figure 2.5-1. These loads include the electric loads of the circuit breaker #1 on CT0, CT1 and CT2, the circuit breaker #2 on CT3, CT4, and CT5, and the circuit breaker #3 on CT6, CT7 and CT8.

The electrical loads for logger #949 are shown in Figure 2.5-2. . These loads include the electric loads of the circuit breaker #4 on CT0, CT1 and CT2, the circuit breaker #5 on CT3, CT4, and CT5, the circuit breaker #6 on CT6, CT7 and CT8, the circuit breaker #7 on CT9, CT10, and CT11, and the circuit breaker #8 on CT12, CT13, and CT14.

The ambient conditions monitored by logger #949 are shown in Figure 2.5-3, which include the ambient temperature, relative humidity, and solar.

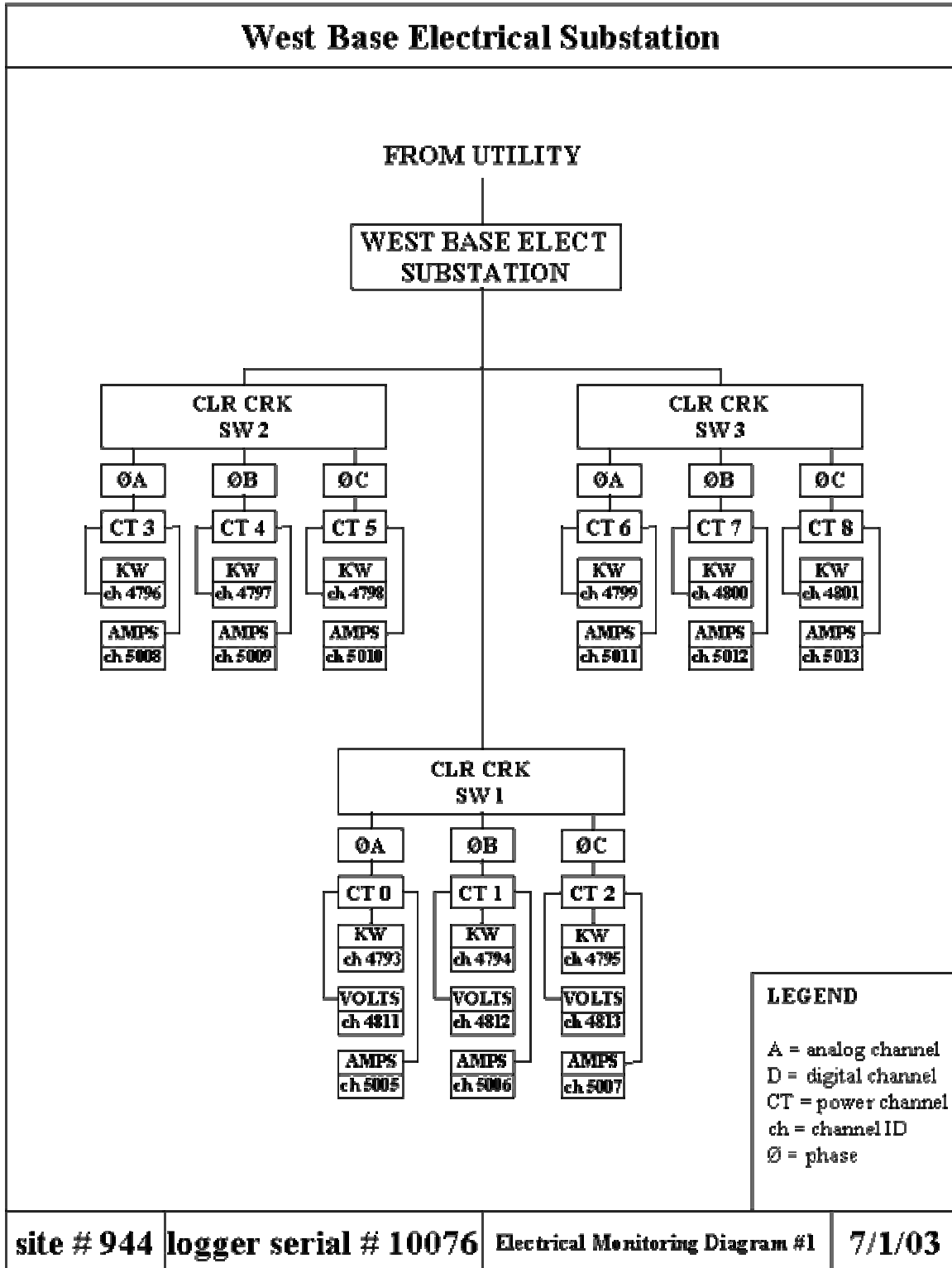


Figure 2.5-1: Electrical Monitoring Diagram for West Electrical Substation (Logger #944)

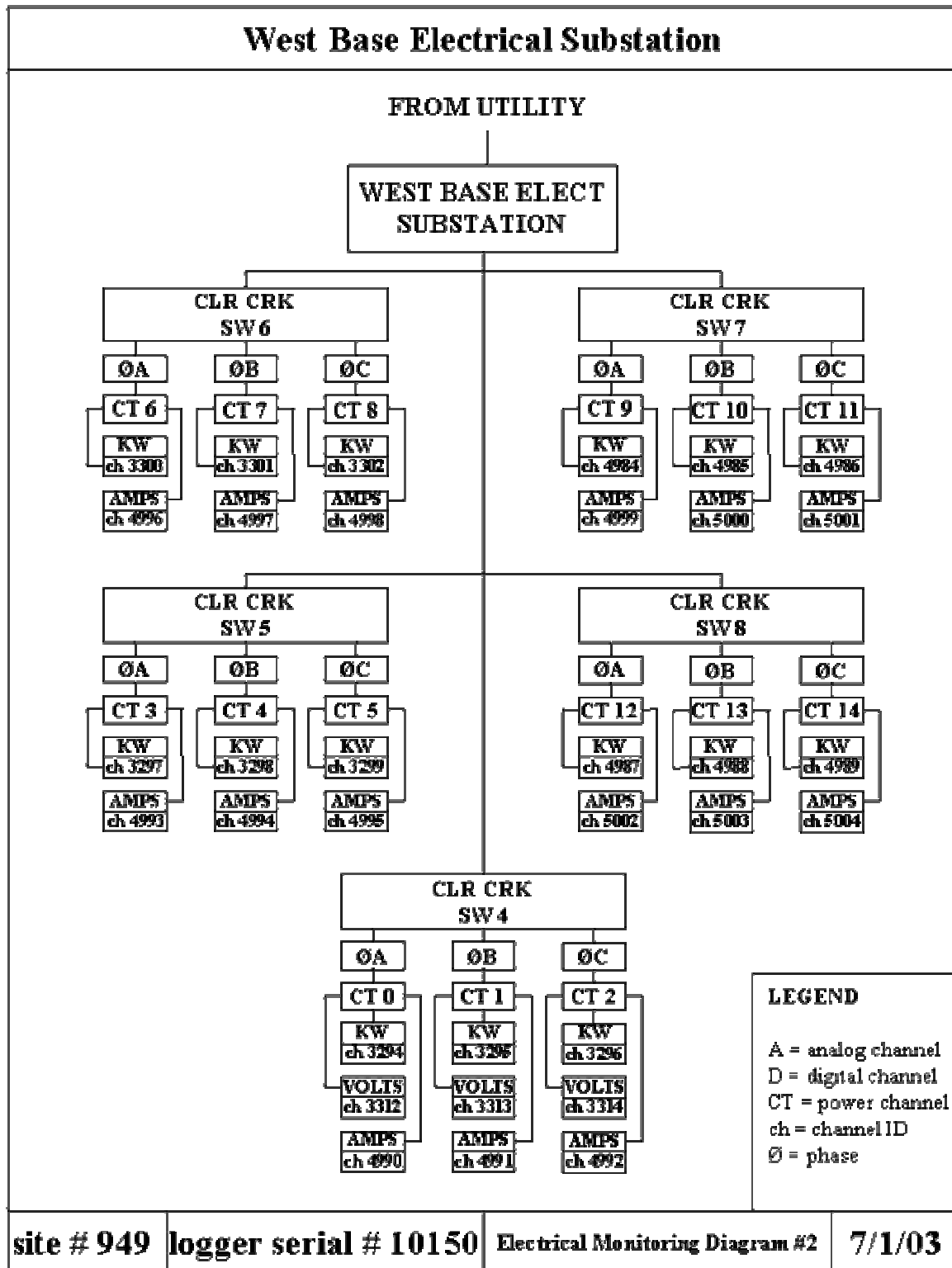


Figure 2.5-2: Electrical Monitoring Diagram for West Electrical Substation (Logger #949)

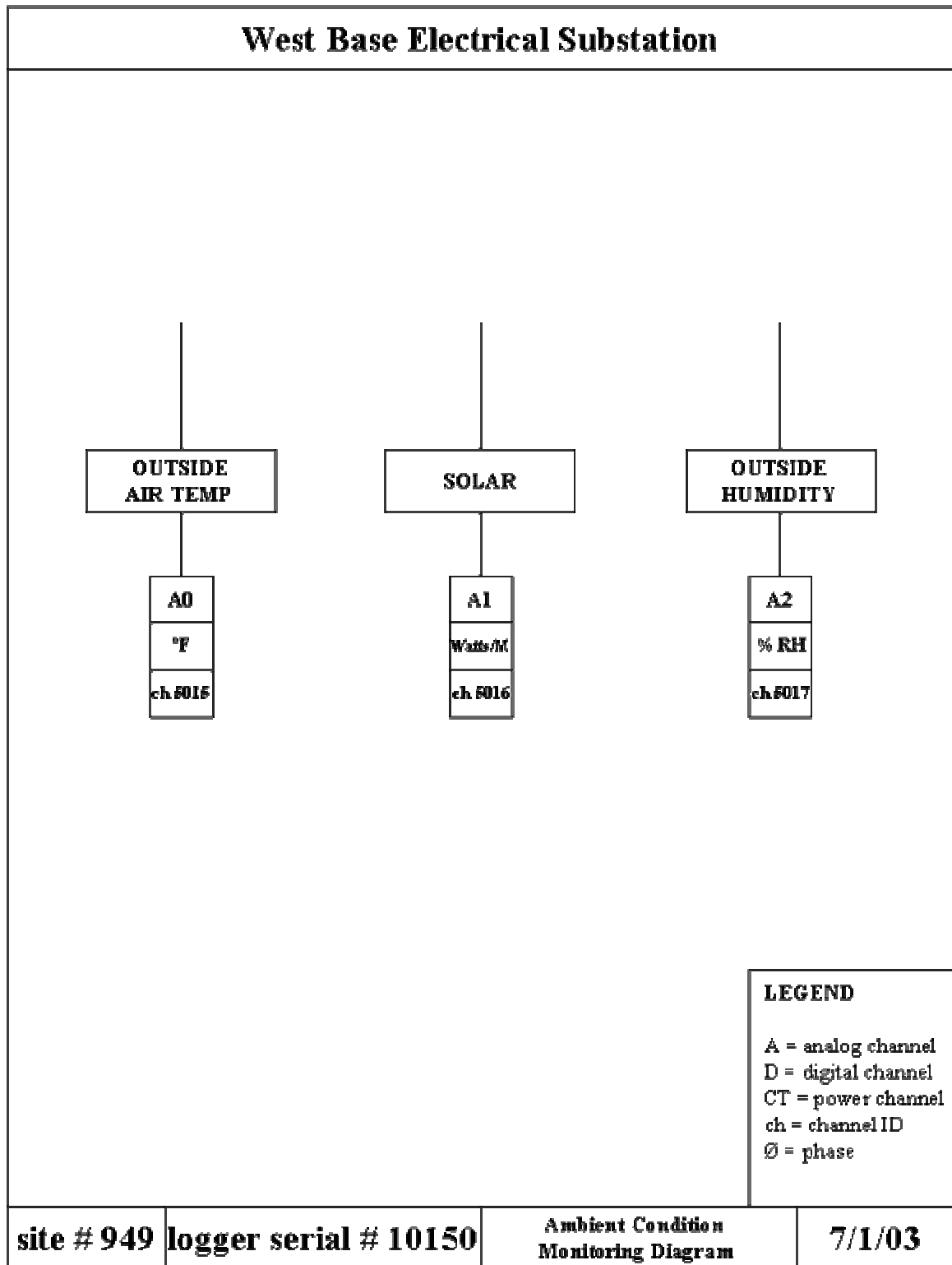


Figure 2.5-3: Ambient Conditions Monitored at West Electrical Substation (Logger #949)

2.6. North Fort Hood Substation

A new data logger was installed in the North Electrical Substation by SiTEX under direct contract to the Ft. Hood Energy Office in 2003. This section of the report contains the electrical and thermal monitoring diagrams for the logger that was installed. Appendix I contains the logger parameter sets that are used to configure the logger. A calibration report for this logger was provided directly to the Ft. Hood Energy Office.

The electrical loads for logger #937 are shown in Figure 2.6-1. These loads include the main electric loads of the feeder #1 on CT0, CT1 and CT2, the feeder #2 on CT3, CT4, and CT5, and the feeder #3 on CT6, CT7 and CT8.

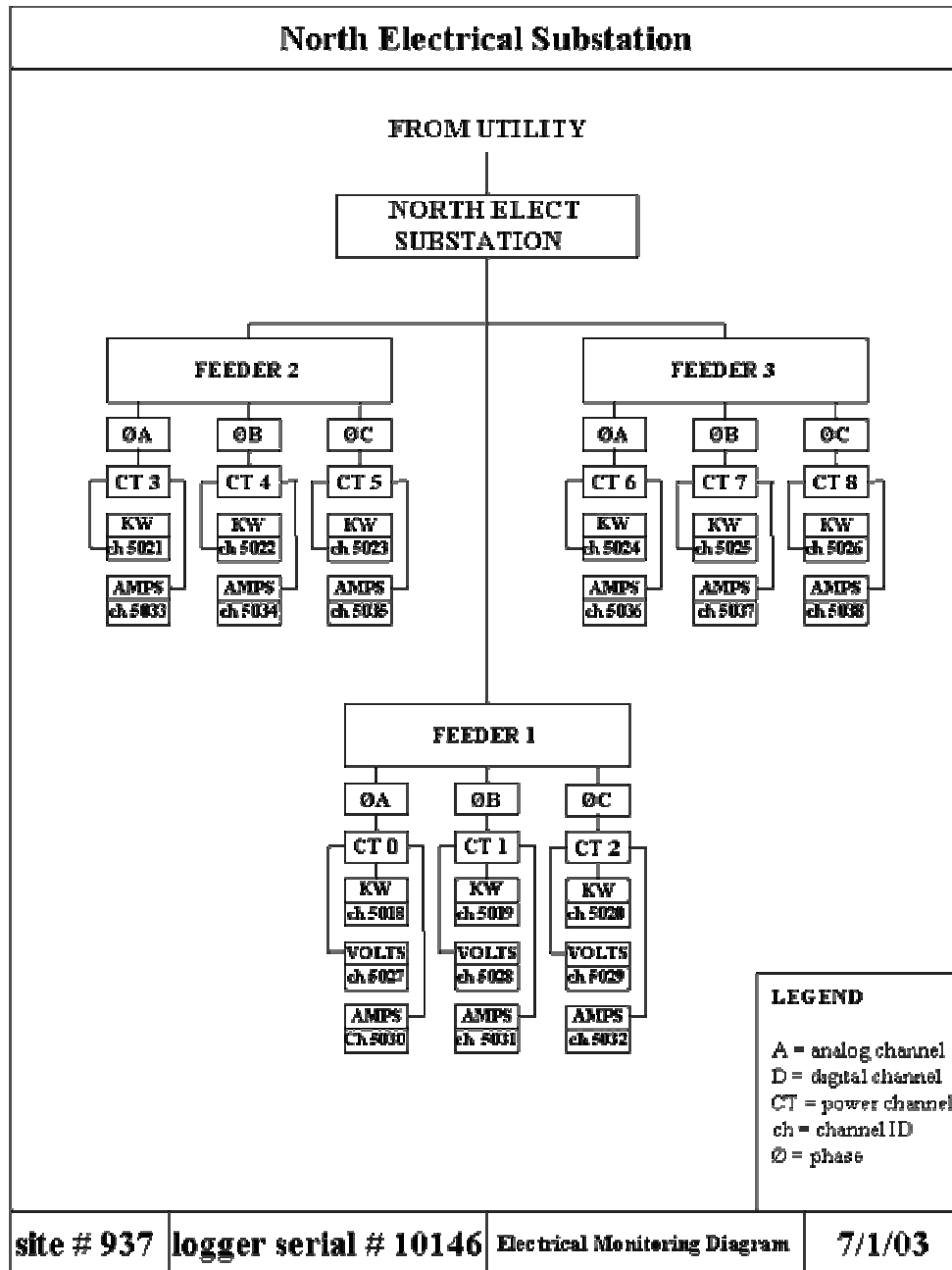


Figure 2.6-1: Electrical Monitoring Diagram for North Electrical Substation

3. DATA COLLECTED DURING THE PERIOD SEPTEMBER 2003 TO OCTOBER 2004.

3.1. Loggers reported on in this report.

The loggers currently being polled at Ft. Hood include the following sites. A complete listing of all the channels if provided in the appendix to this report. A brief explanation of the loggers at the Thermal plant and the III Corp building is provided in this section.

Loggers installed by SiTEX and verified by the ESL:

938 - 3279 - Ft Hood - Central Thermal Power Plant (87000)
 947 - 10043 - III Corps
 939 - 3832 - Darnall Hospital #1
 940 - 3831 - Darnall Hospital #2
 941 - 10147 - Main Electrical Substation #1
 946 - 10148 - Main Electrical Substation #2
 948 - 10149 - Central Elect Power Plant (Main Substation #3)
 944 - 10076 - Ft Hood - Clear Creek Substation
 949 - 10050 - Ft Hood West Substation

Loggers installed and verified by SiTEX:

937 - 10146 - North Fort Hood

3.2. Data collected in this report.

3.2.1. Logger #938 - 3279 - Ft Hood - Central Thermal Power Plant (87000)

3.2.1.1. Electricity use monitoring

Figure 0-1 displays a time series plot of the electricity data that were recorded for the period from September 2003 to October 2004. The upper graph of this figure shows the whole-plant electricity use and the electricity used by the chiller, which represents a significant portion of the plant's electricity use, as expected. The second graph in this figure shows the chiller electricity and the lower graph in this figure shows the derived electricity use, which is calculated by subtracting the chiller electricity use from the whole-plant electricity use, and represents electricity use of the chilled water pumps, and other parasitic loads in the plant. This has been labeled as chiller pump electricity since the chiller pumps are felt to account for the largest portion of this use.

Several features are worth noting in these plots. First, the chiller clearly represents the largest portion of the plants electricity use. The plant's electricity use is less than 100 kWh/hr when the chillers are not running. Second, aside from start up transients, the plant operates at a relatively constant load when the chillers are running (depending on the number of chillers running), and consumes very little power when the chillers, and associated loads, are not running. Finally, the pumps and other loads represent a sizeable portion of the plant's load, which offers an opportunity for energy savings if these can be minimized when cooling is not required by the buildings served in the 87000 block.

3.2.1.2. Thermal energy use monitoring

The thermal energy of the plant is shown in Figure 0-2. In the upper graph the natural gas use is shown. The calculated chilled water production is shown in the lower graph (i.e., this is calculated by multiplying the recorded flow rate times the recorded temperature difference for each hour).

Several features are worth noting in these plots. First, in the upper plot of Figure 0-2, a significant amount of natural gas continues to be consumed in the summer time when the plant is providing relatively small heating loads. A large portion of this load would appear to be heat that is lost to the piping network that delivers the

steam to the buildings. Hence, this presents an energy conserving opportunity of the loads served in the summer can be provided by more efficient means than running the thermal plant boilers.

Chilled water production stopped in December of 2003 and started again in March of 2004 as the cooling loads became more significant. During periods when the plant is not operating the chillers the electricity use is less than 25 kW.

3.2.1.3. Ambient conditions monitoring

In Figure 0-3 the data that represent the ambient conditions are shown, and in Figure 0-4 the measured ambient temperature and humidity at Ft. Hood are compared against similar hourly data from the National Weather Service (NWS). Although there is significant scatter in the temperature and humidity comparison graphs, the scatter in the data shown are similar to comparisons at other sites. There are several reasons for this large amount of scatter. First, the NWS data represent a 3 to 5 minute recording window centered at 15 minutes before the hour. Hence, for example, the readings at 10:00 a.m. would represent the average of measurements taken from 9:42 to 9:45 a.m. Whereas, the 10:00 a.m. measurements on the data logger would represent the average of measurements taken from 9:00 a.m. to 10:00 a.m. Second, in the case of the humidity measurements, the large amount of scatter is caused in part by the error in several instruments (i.e., the wet bulb reading and dry bulb reading needed to compute the RH measurements compared to the RH measurement at the thermal plant).

3.2.1.4. Chiller monitoring

Additional data regarding the chiller monitoring can be seen in Figure 0-5. Throughout the entire period from September 2003 to October 2004 the flow remained at 2,800 gpm. This is the same as 2003 but in contrast to the year of 2001 when the flow varied from 1,200 – 1,600 gpm in September and October 2001, increasing to 2,800 gpm in May of 2002. The large amount of chilled water flow during the period when the chillers are not operating is a phantom flow signal, since there is the pumping electricity use dropped below the levels expected for 2,800 gpm (i.e., 150 kW). This is also confirmed by the chilled water supply and return temperatures that indicate reversed temperatures during this period (i.e., the supply becomes higher than the return temperature), and both temperatures would seem to be indicating mechanical room temperatures, versus the expected chilled water temperatures of 40 – 50 F.

The same as the operation in 2002/2003, the chilled water temperature difference and supply and return temperatures were relatively constant at 2 to 8 F, which indicates an opportunity to save pumping energy and chiller energy if the temperature difference could be maintained at a more optimal 10 to 15 F.

The hourly chiller electricity use are plotted against the ambient temperature as shown in Figure 0-6. Though not very clear, two different groups of data representing the operation of one or both chillers. The hourly cooling loads as measured by the chilled water are shown in Figure 0-7.

3.2.1.5. Natural gas monitoring

In Figure 0-2 and Figure 0-8 the natural gas use of the plant is shown (NOTE: this has been rescaled since the 2002 and 2001 reports x 12.52). Figure 0-2 is a time series trace. Figure 0-8 shows the hourly data plotted against ambient temperature.

3.2.2. Logger: #947 - 10043 - III Corp Building

Figure 0-9 shows the whole-building electricity use, chiller electricity use and motor control center electricity use (MCC) for the III Corp building.

Figure **0-10** shows the whole-building natural gas use.

Figure **0-11** shows the whole-building natural gas use versus ambient temperature and Figure 0-12 shows the whole-building chiller electricity use versus temperature.

3.2.3. Loggers: #939 - 3832 - Darnall Hospital #1 and #940 - 3831 - Darnall Hospital #2

Data loggers have also been installed in the Darnall Hospital. Figure 0-13 shows the whole-building electricity use and the chiller electricity use. Whole-building electricity use, chiller and MCC electricity use in the Darnall Hospital were missing from February to October 2004 due to hardware failures. Figure 0-14 shows the electricity use of several motor control centers. Figure 0-15 shows the whole-building natural gas use, which was missing for the entire period due to hardware failures.

3.2.4. Loggers: #941 - 10147 - Main Electrical Substation #1, #946 - 10148 - Main Electrical Substation #2 and #948 - 10149 - Main Electrical Substation #3

Three existing data loggers were recalibrated and restarted in the Main Electrical Substation. In Figure 0-16 the electricity use of these three loggers and the total electricity use of the Main Substation are shown. The electricity use data were missing for the periods January 2004 to May 2004 due to hardware failures.

3.2.5. Loggers: #944 - 10076 - West Electrical Substation #1 and #949 - 10150 - West Electrical Substation #2

Two new data loggers were installed in West Electrical Substation. Figure 0-17 shows the electricity use from the two loggers and the total electricity use of the West Substation. The data were missing for a couple of periods in August 2004 and September 2004 due to logger communication problems.

3.2.6. Loggers: #937 - 10146 - North Electrical Substation

One new data logger was installed in North Electrical Substation in June 2003. Figure 0-18 shows the electricity use of the North Substation.

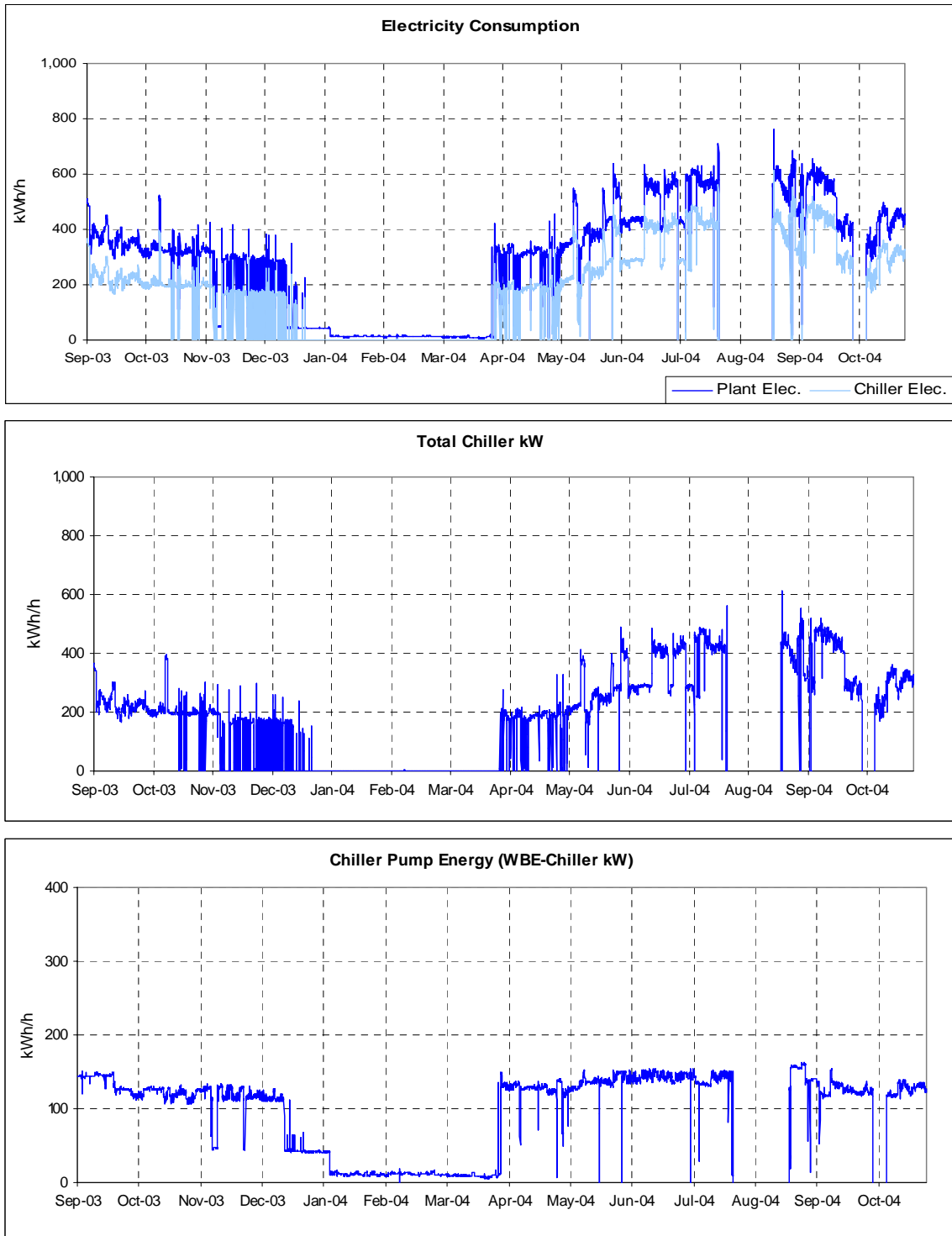


Figure 0-1: 87000 Block Thermal Plant Electricity Use: Total, Chiller & Pump Use.

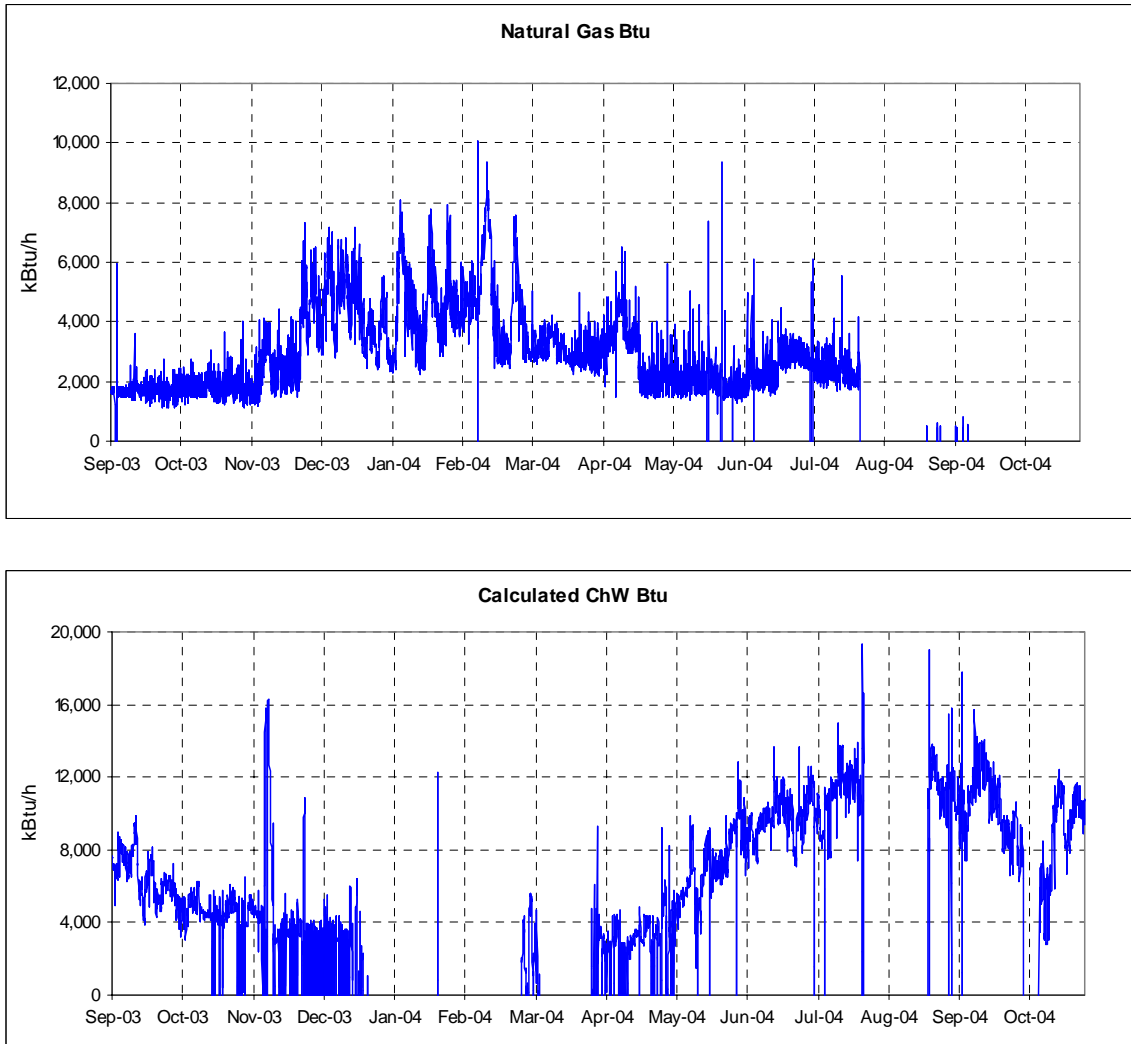


Figure 0-2: 87000 Block Thermal Plant Gas use and Chilled Water Production.

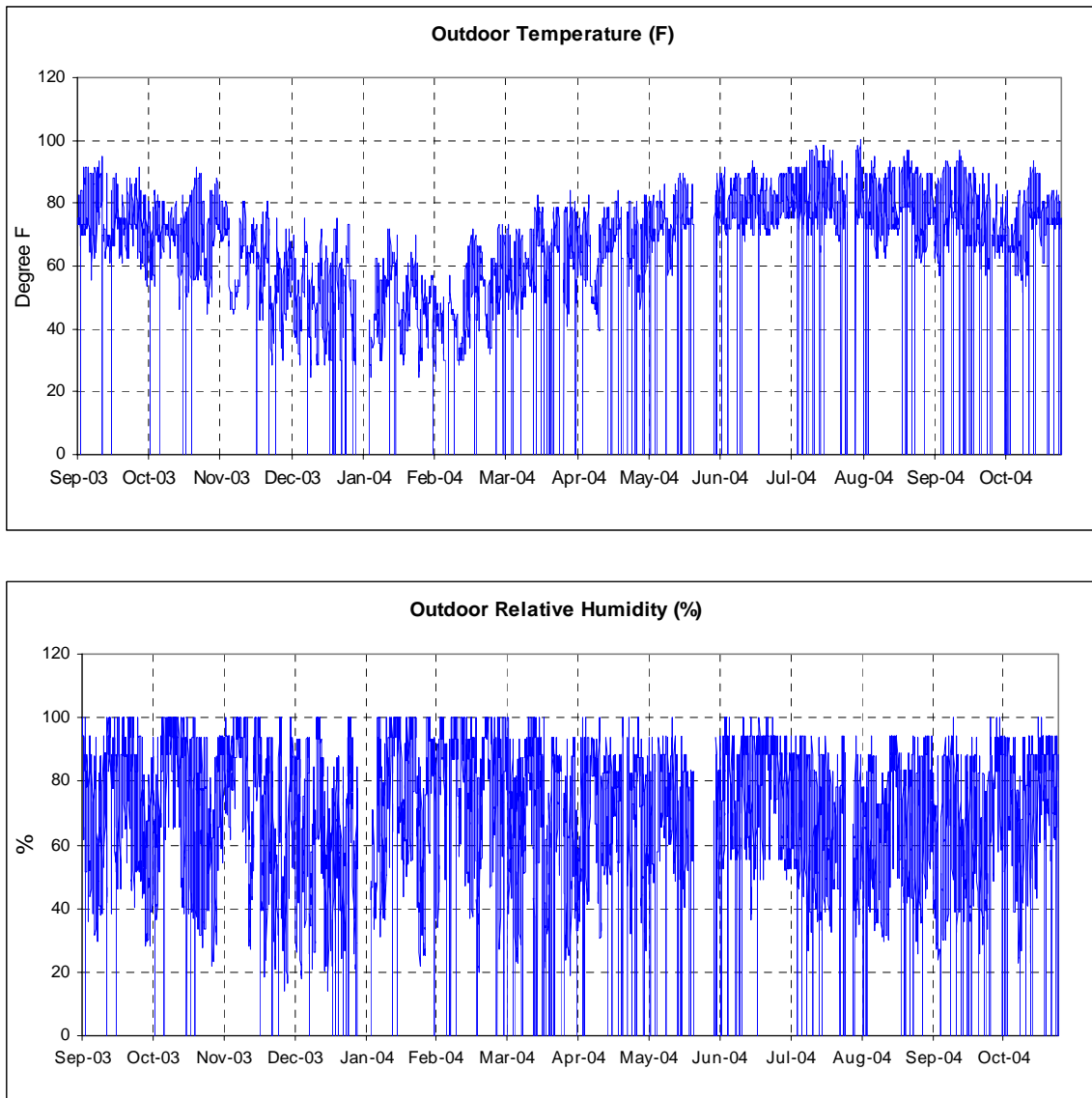


Figure 0-3: 87000 Block Thermal Plant Ambient Conditions.

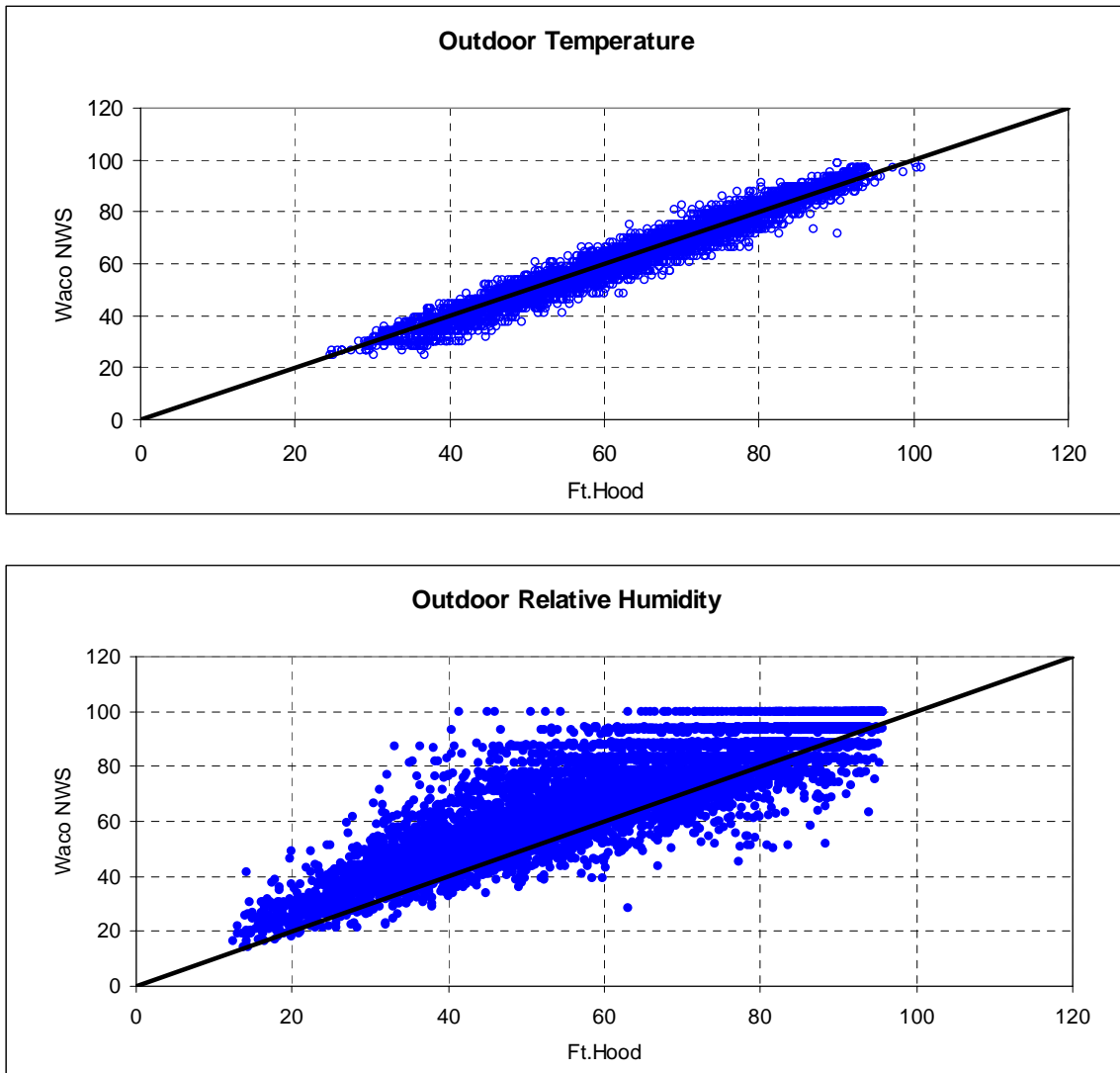


Figure 0-4: 87000 Block Thermal Plant Measured Ambient Conditions vs NWS Ambient Conditions (Waco): Temperature and Humidity.

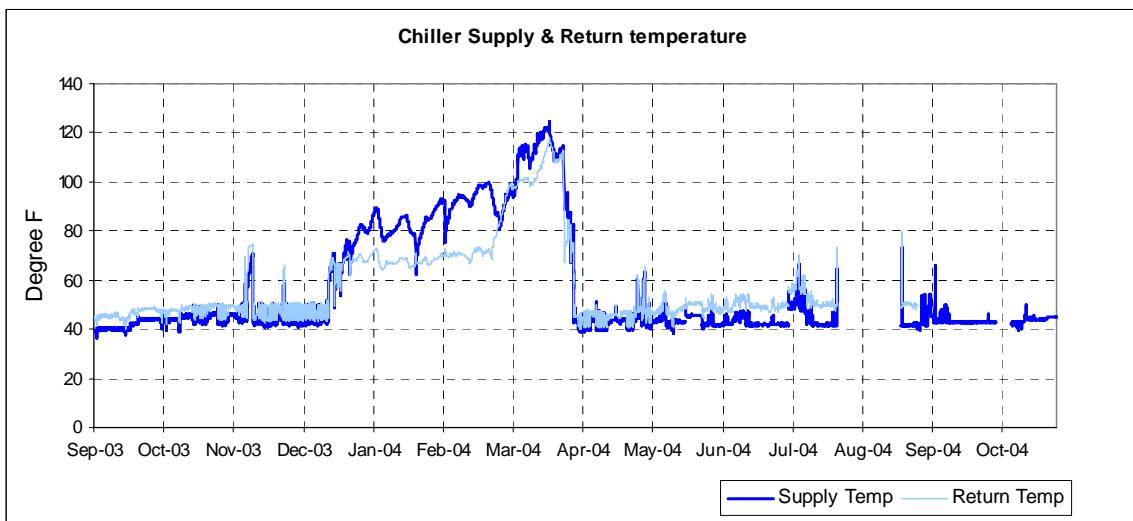
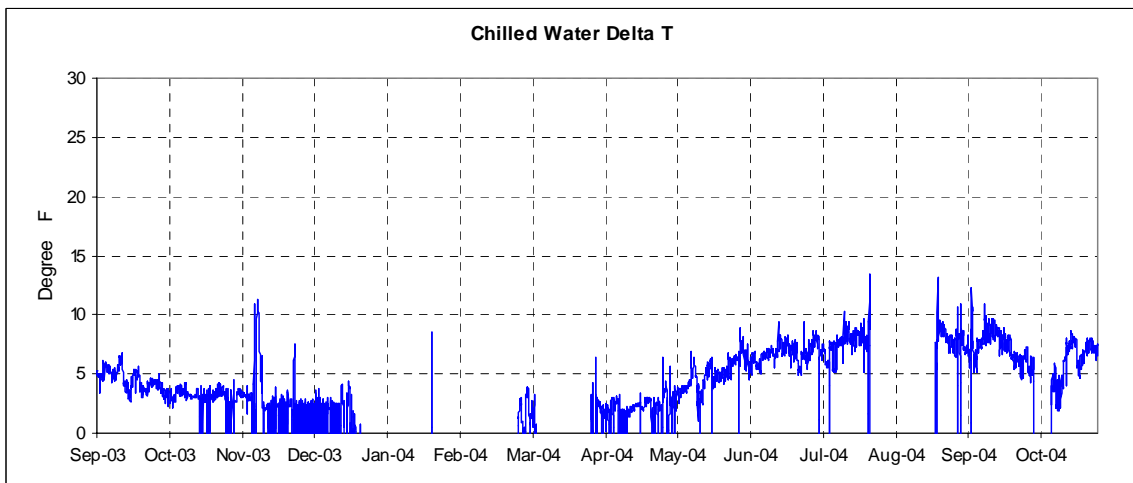
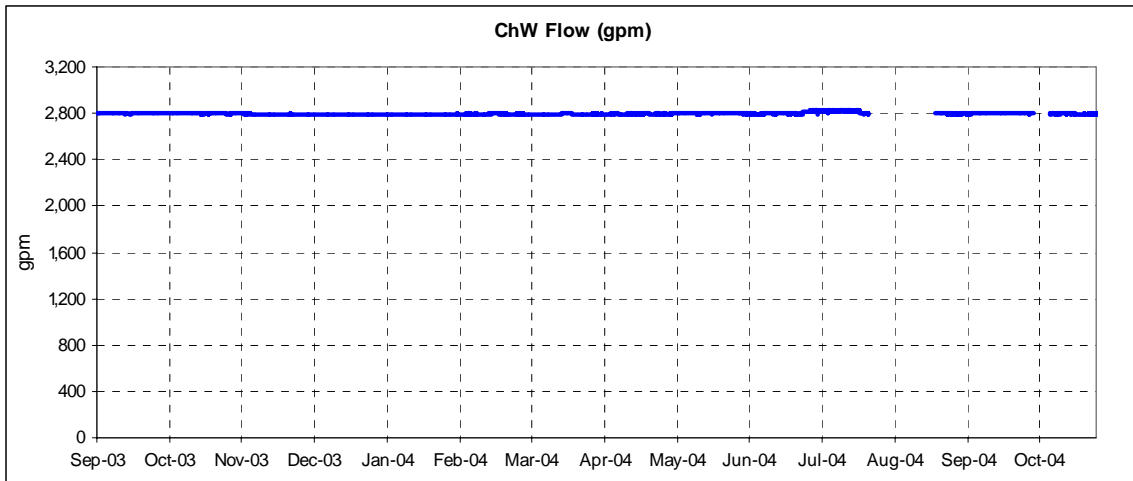


Figure 0-5: 87000 Block Thermal Plant Chiller Monitoring Flow, and Supply and Return Temperatures.

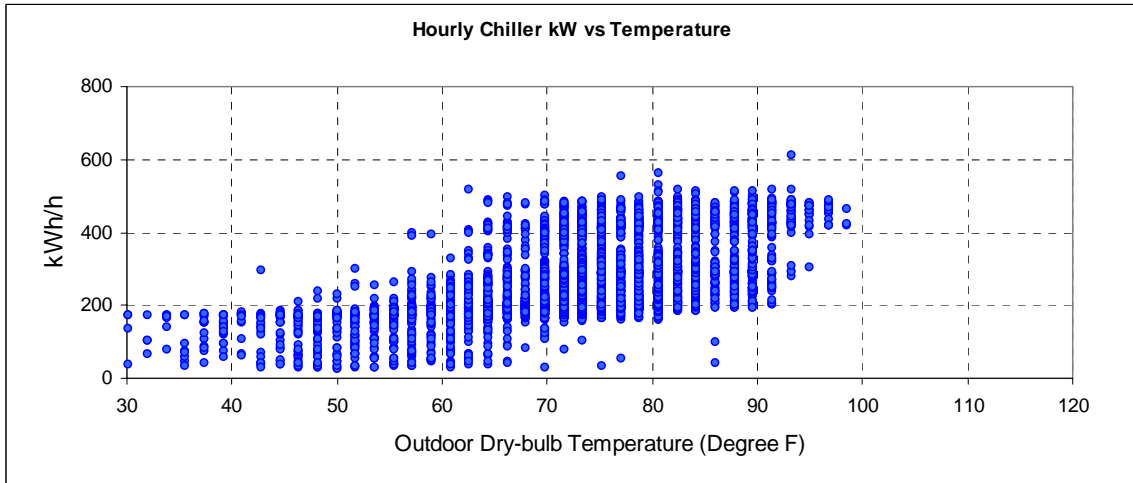


Figure 0-6: 87000 Block Thermal Plant Chiller Electricity Use vs. Ambient Conditions (hourly data).

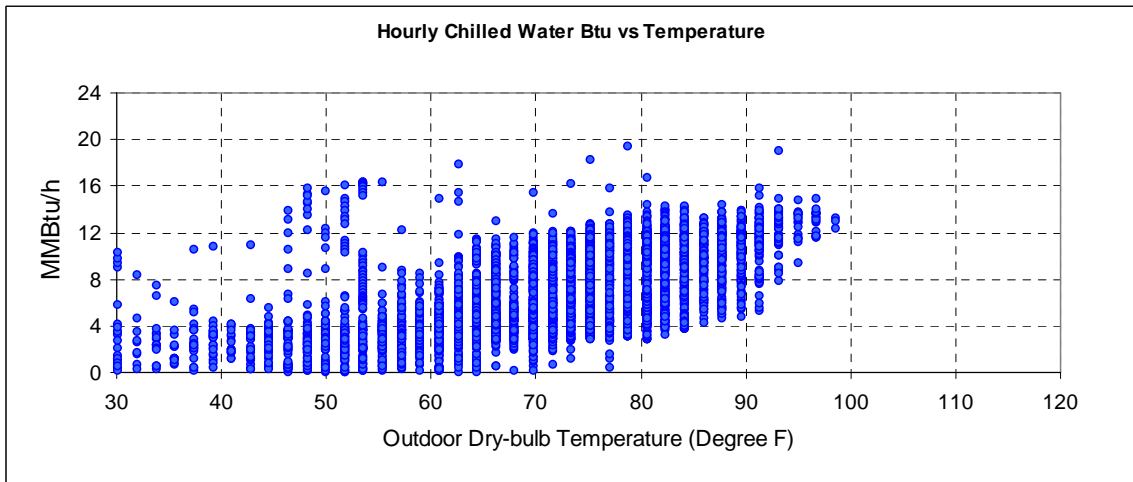


Figure 0-7: 87000 Block Thermal Plant Chilled Water Production vs Ambient Conditions (hourly data).

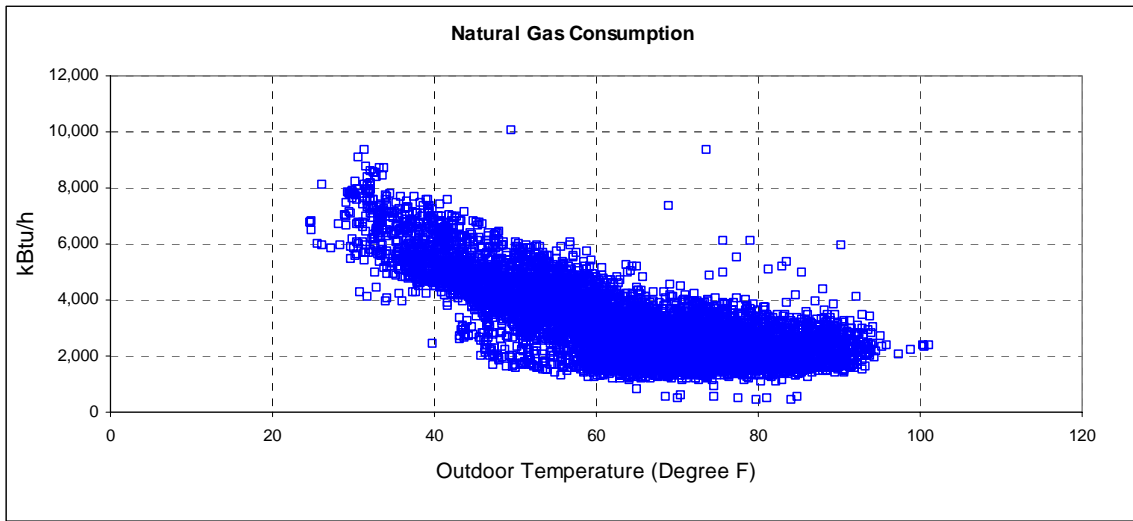


Figure 0-8: 87000 Block Thermal Plant Natural Gas Consumption vs Ambient Conditions (hourly data).

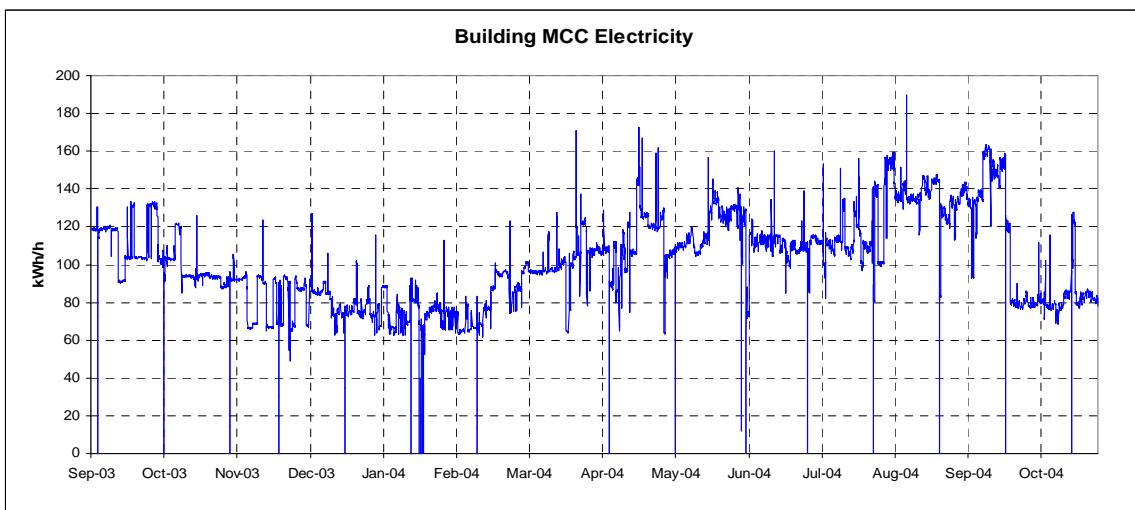
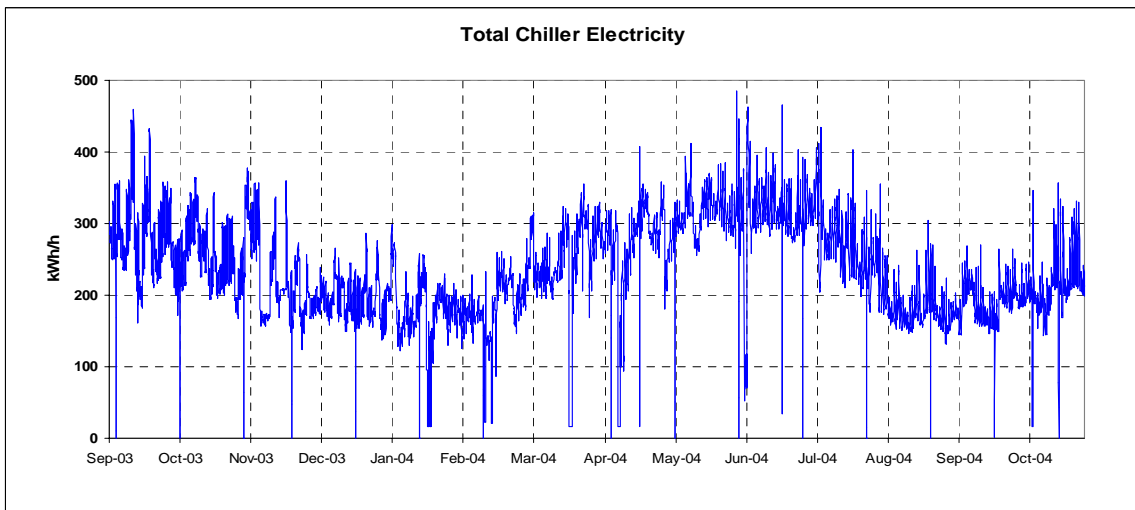
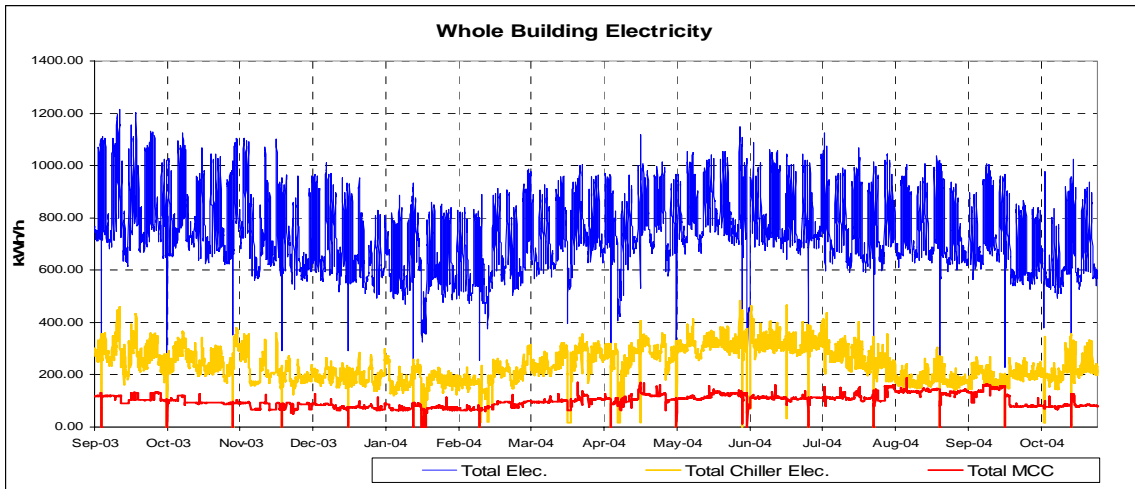


Figure 0-9: III Corp Electricity Use: Whole-building, Chiller and MCC Use.

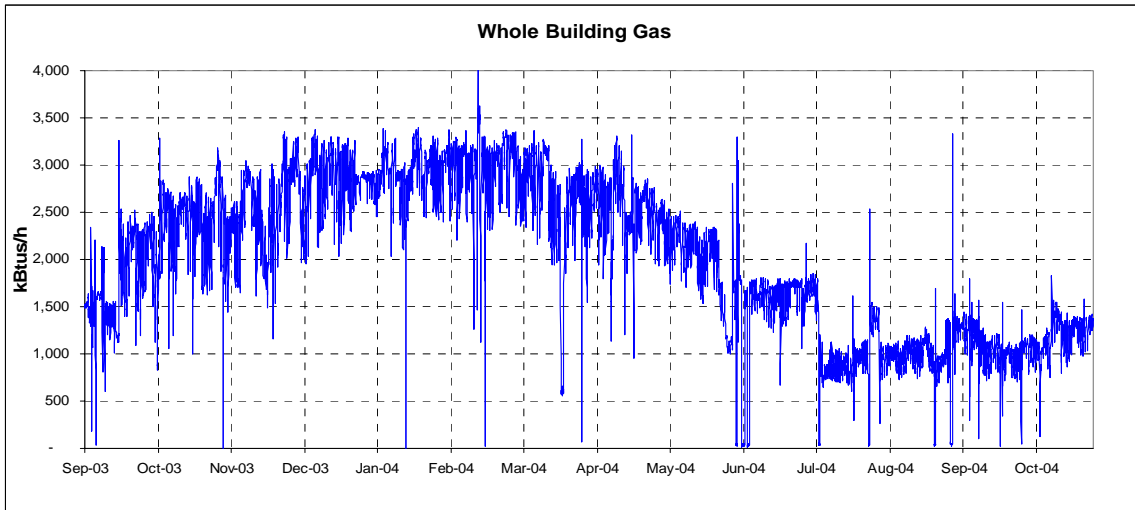


Figure 0-10: III Corp Natural Gas Use

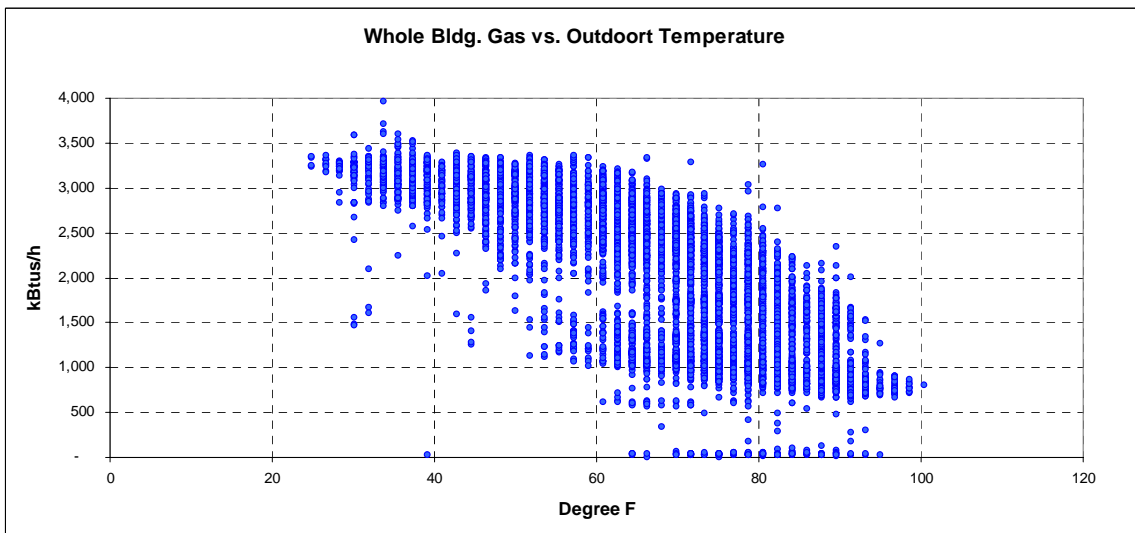


Figure 0-11: III Corp Natural Gas Use vs Temperature.

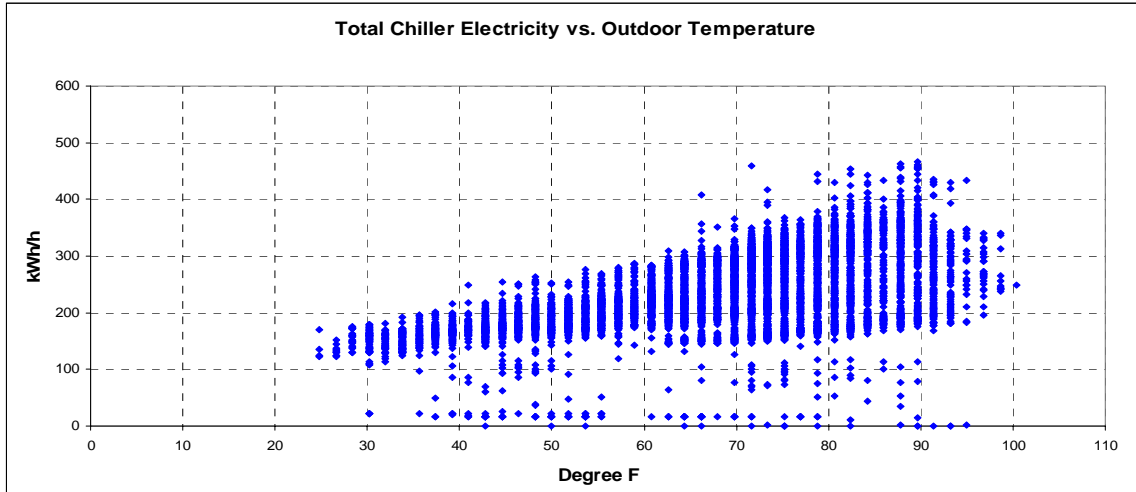


Figure 0-12: III Corp Chiller Electricity Use vs Temperature.

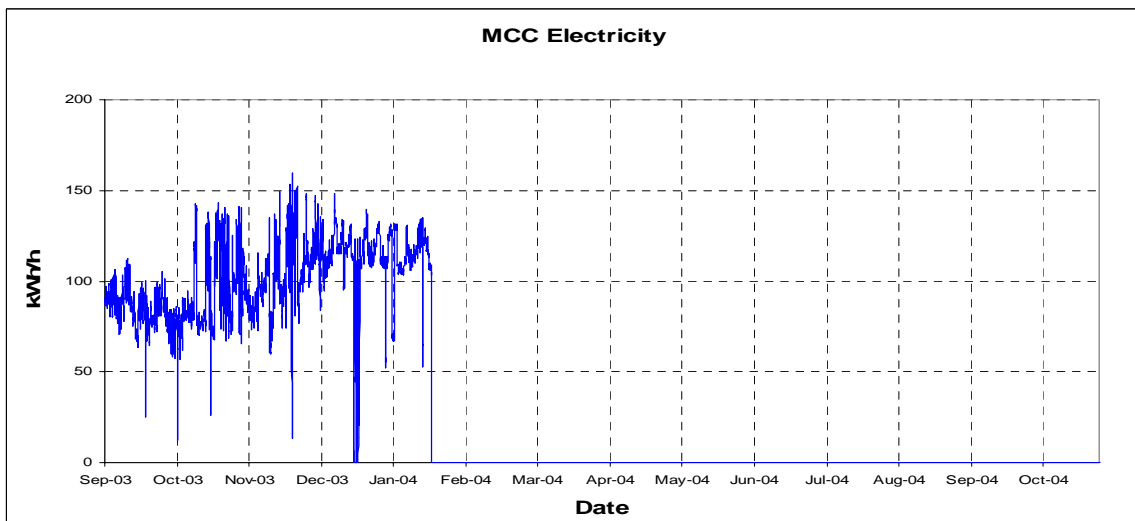
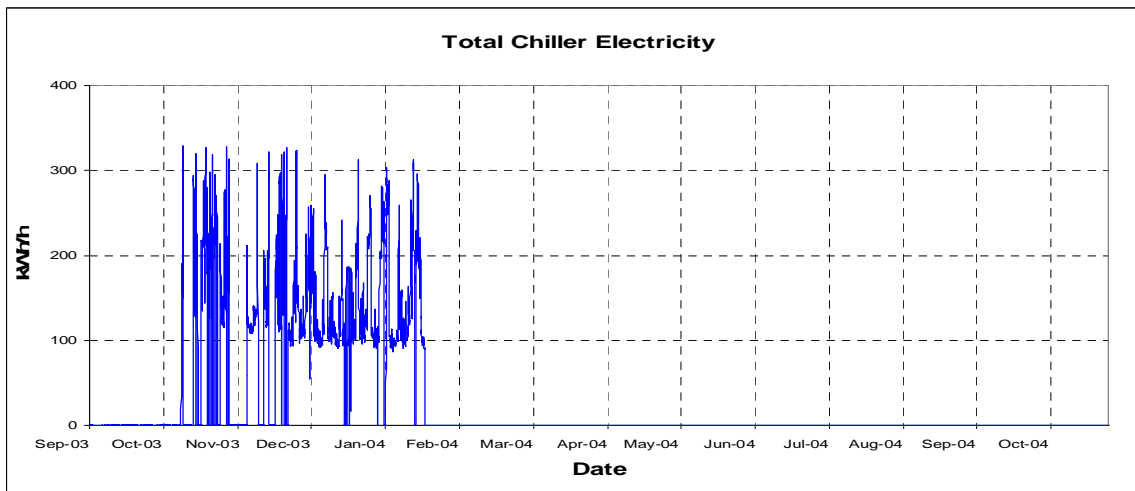
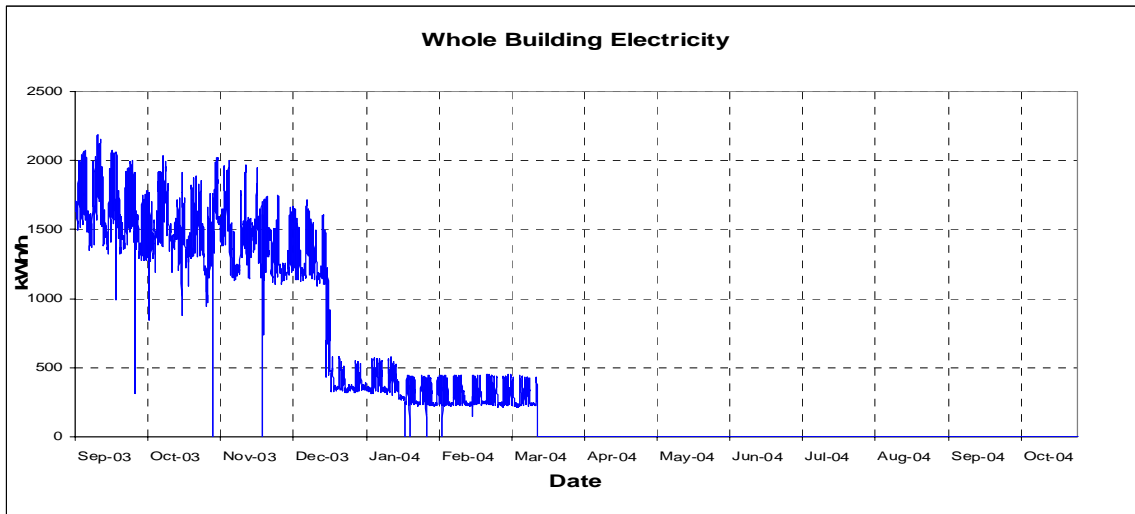


Figure 0-13: Darnall Hospital Electricity Use: Total, Chiller Electricity and MCC Use.

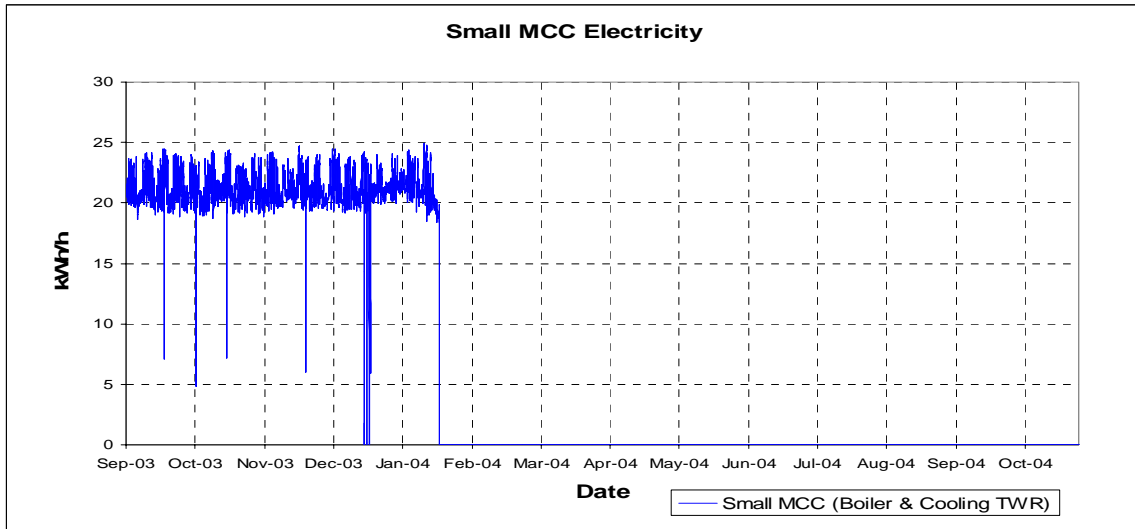


Figure 0-14: Darnall Hospital Electricity Use -Small MCC Use.

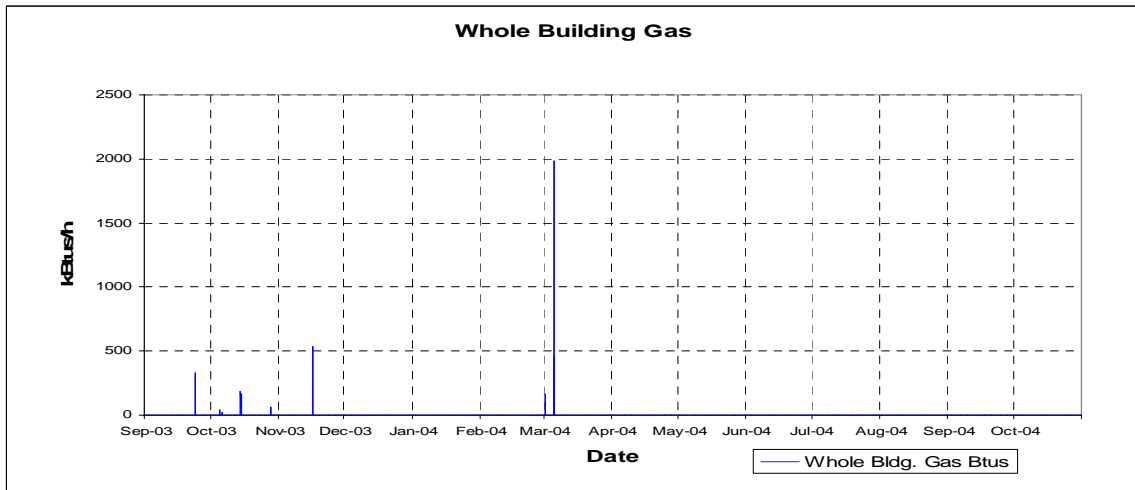


Figure 0-15: Darnall Hospital Natural Gas Use.

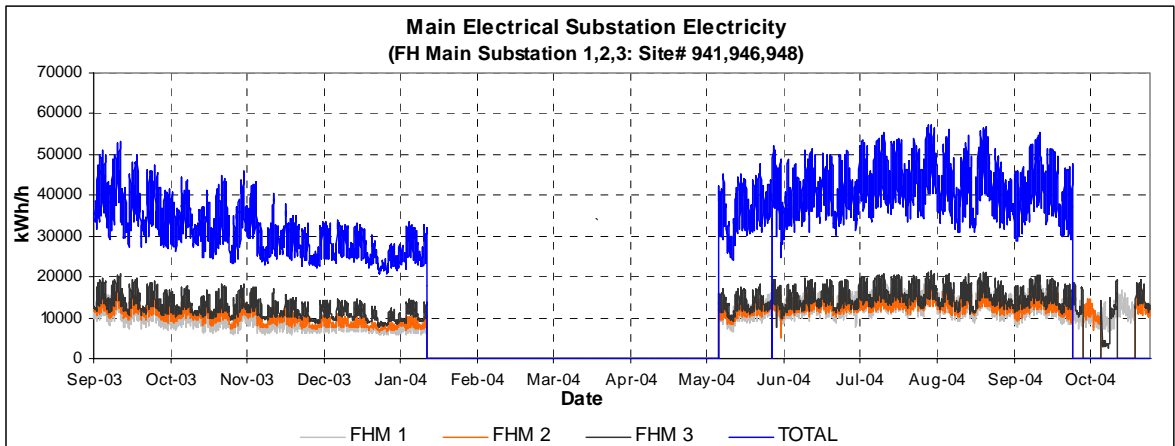


Figure 0-16: Main Electrical Substation Electricity Use.

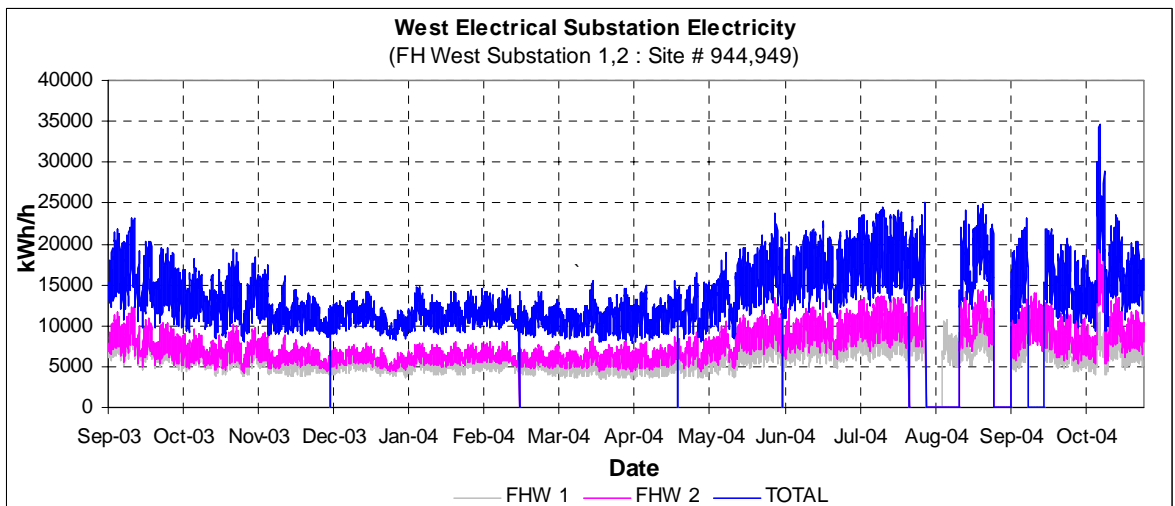


Figure 0-17: West Electrical Substation Electricity Use.

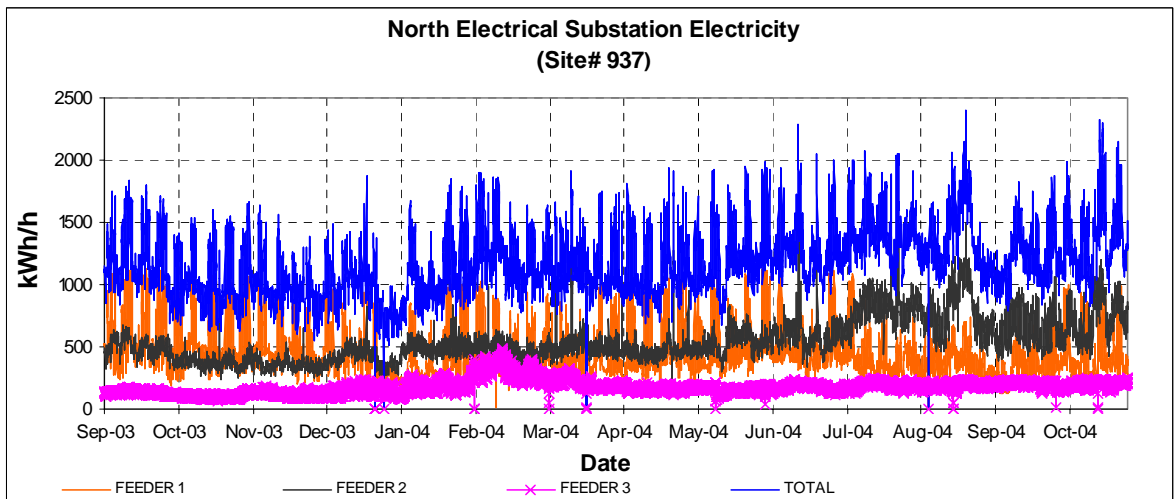


Figure 0-18: North Electrical Substation Electricity Use.

4. WHOLE-BASE NATURAL GAS ANALYSIS

The Ft. Hood base is served by three gas meters, including west, south and north meters. Data from these meters are recorded by TXU and transferred to the Ft. Hood energy office in daily format.

In Figure 4-1, Figure 4-2, and Figure 4-3, the daily gas data for the west, south and north meters for 2003 and 2004 are shown as a time series plots along with the corresponding daily temperature data, respectively. In Figure 4-4, the total natural gas consumption for Ft. Hood are shown as a time series plot. In Figure 4-5, Figure 4-6, and Figure 4-7, scatter plots are shown for the daily gas use versus average daily temperatures from National Weather Service (NWS) for the years 2003 and 2004, for the west base gas meter, south base gas meter and north base gas meter. Figure 4-8 shows the scatter plot of the daily gas use of Fort Hood versus average daily temperatures for 2003 and 2004. In these plots it is clear that there is a strong weather dependency in the natural gas use, as expected.

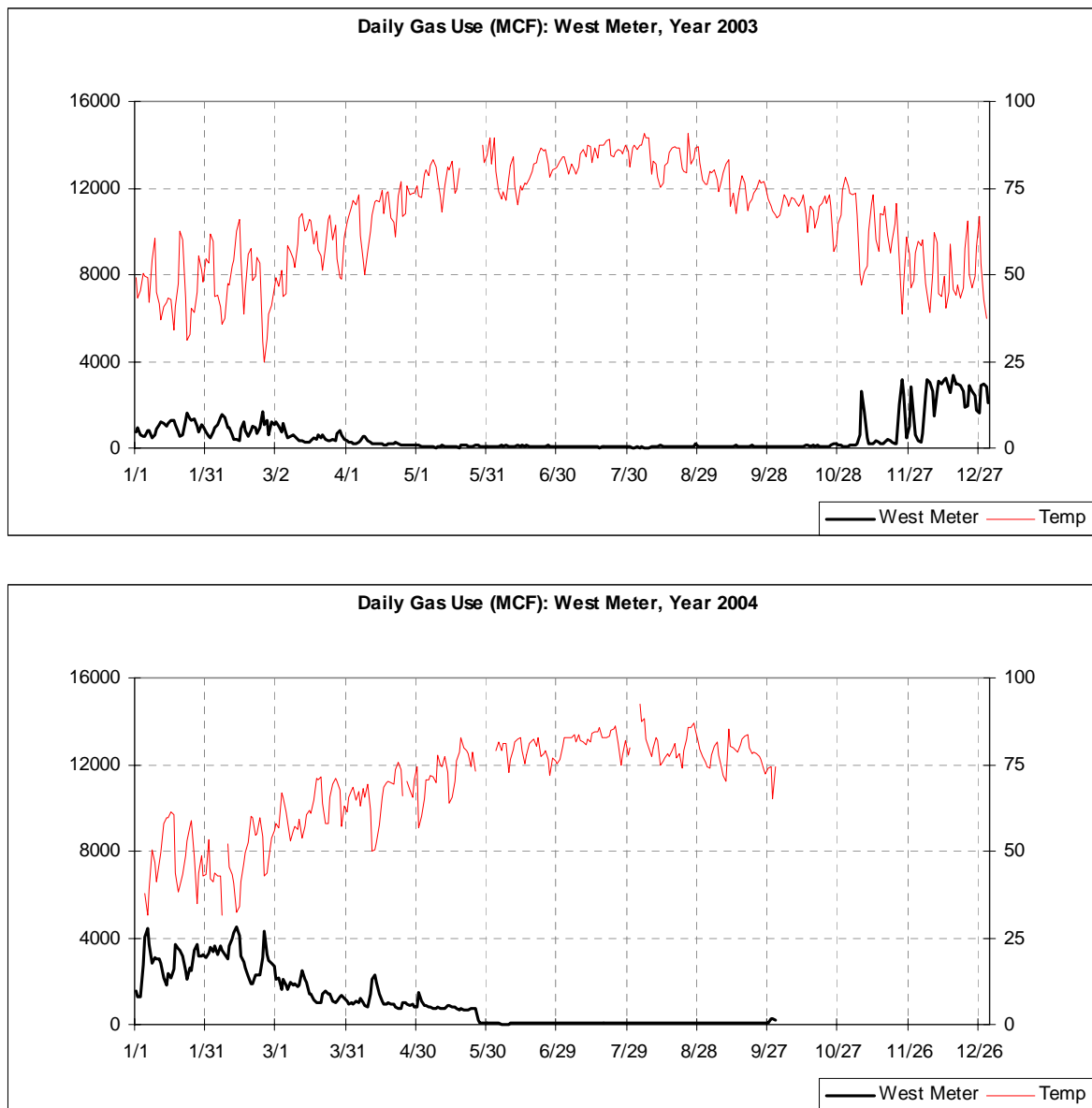


Figure 4-1: 2003 and 2004 Daily Gas Use for West Meters.

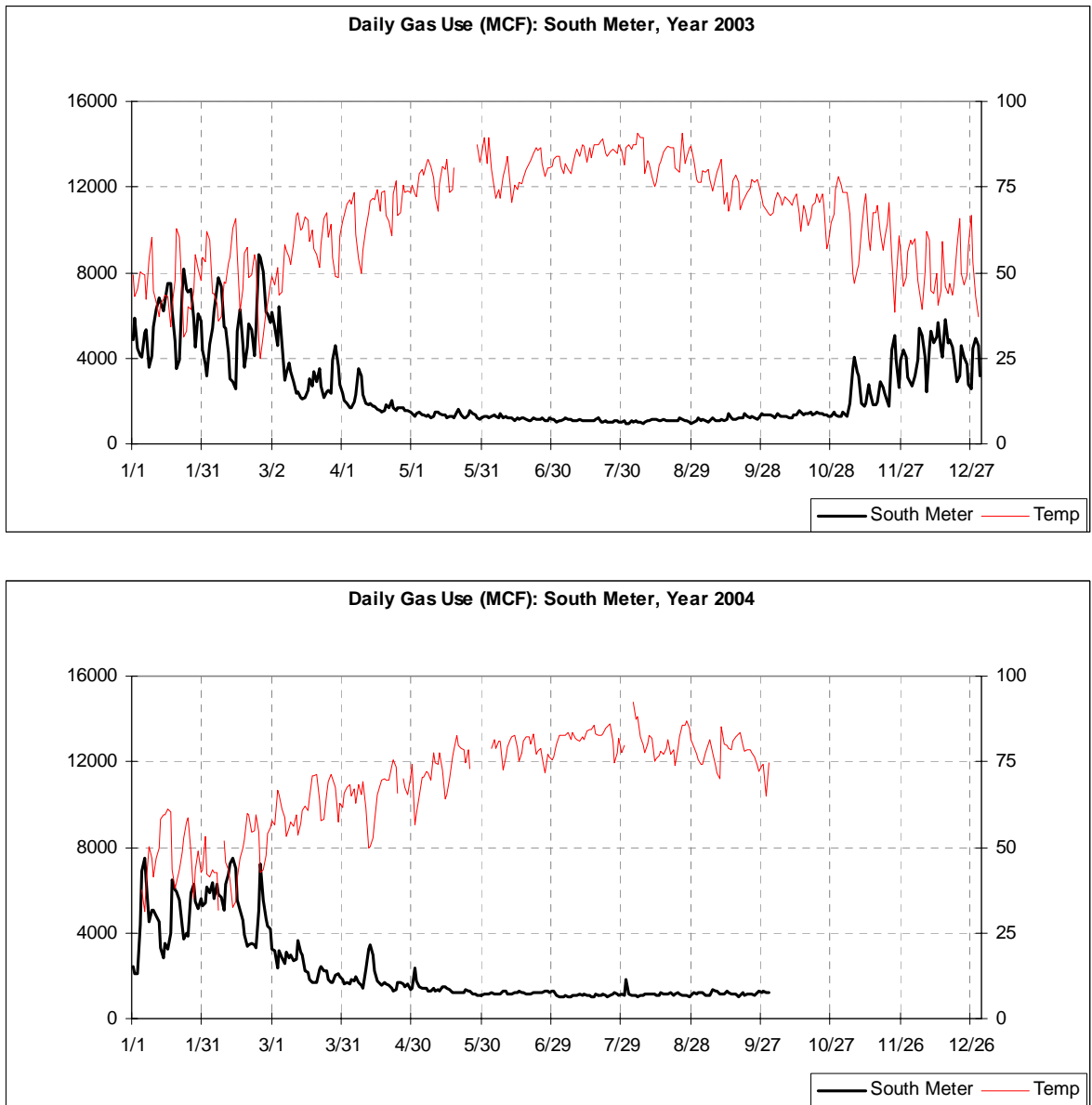


Figure 4-2: 2003 and 2004 Daily Gas Use for South Meters.

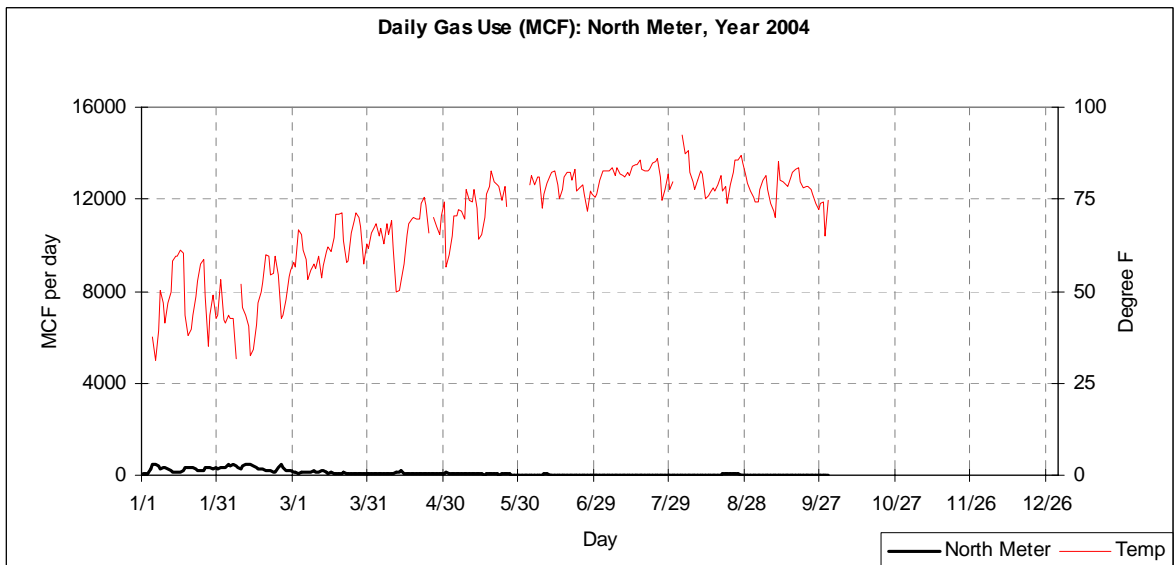
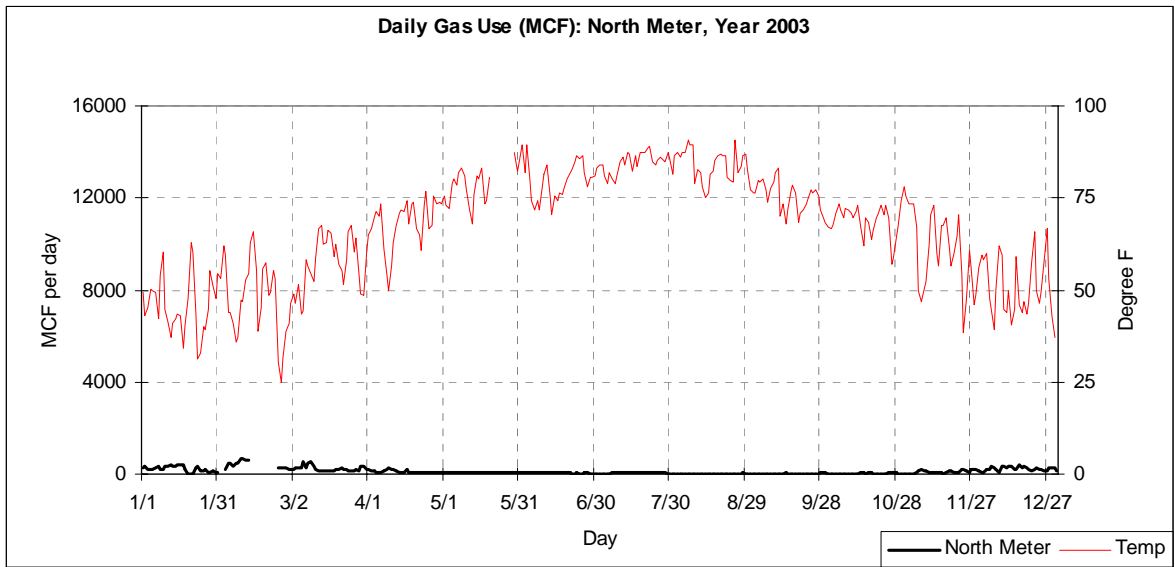


Figure 4-3: 2003 and 2004 Daily Gas Use for North Meters.

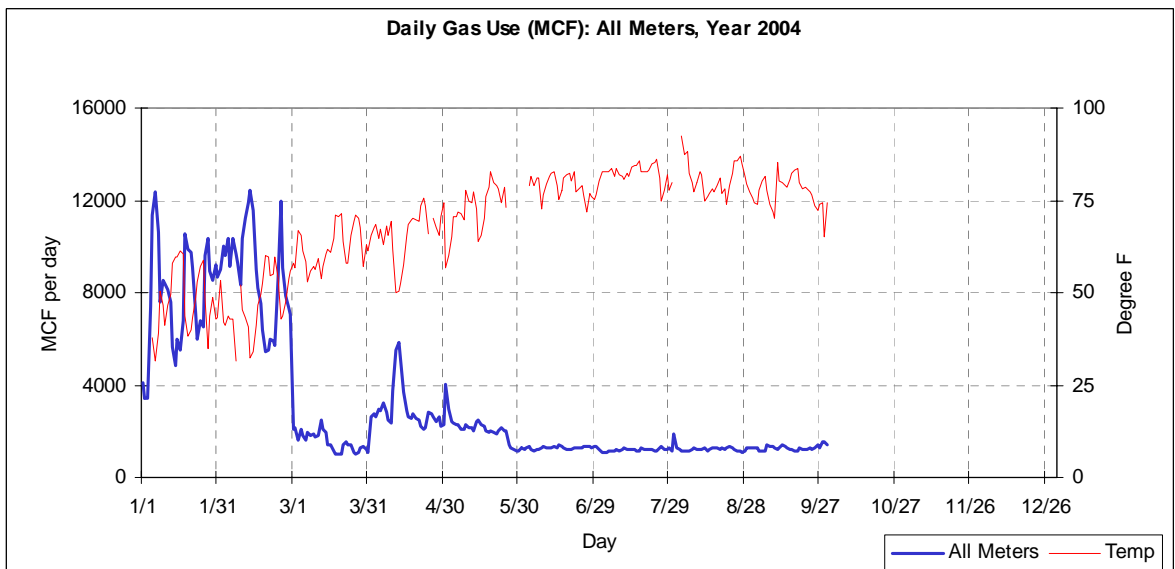
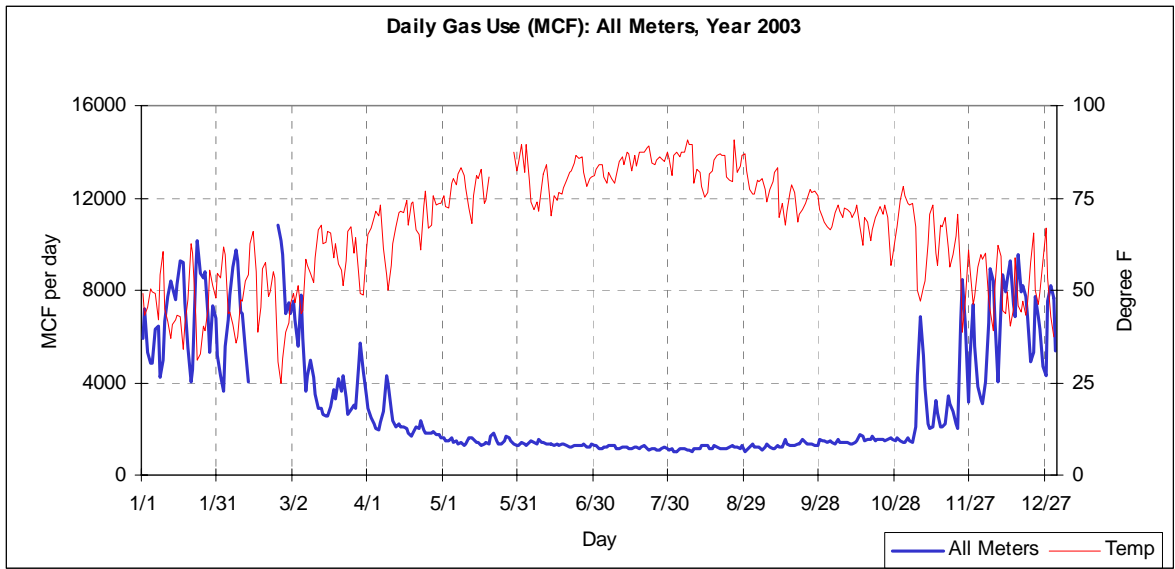


Figure 4-4: 2003 and 2004 Daily Gas Use for All Meters.

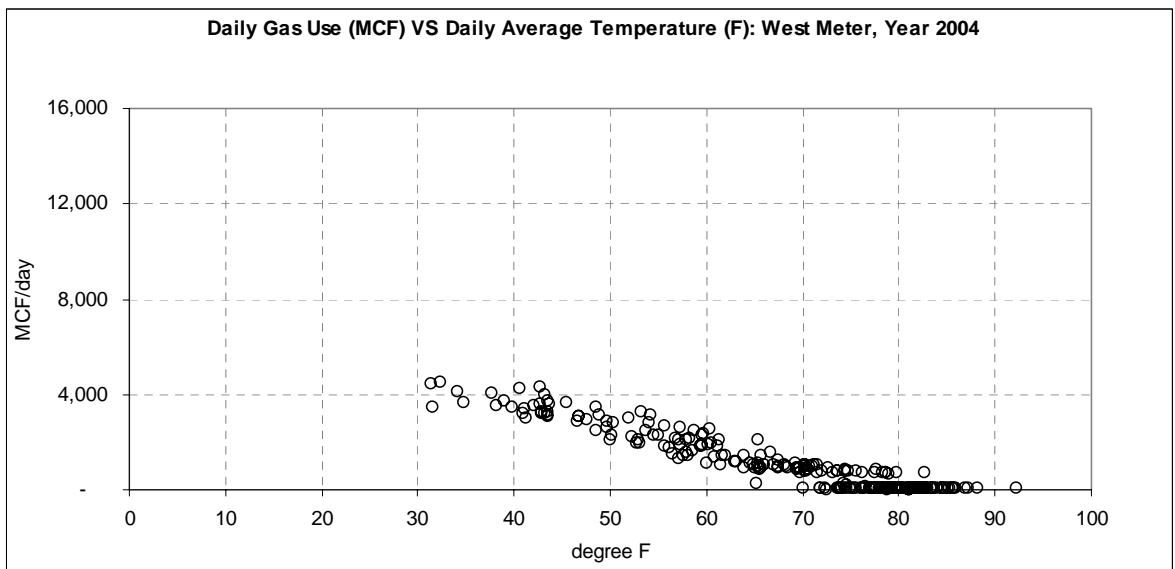
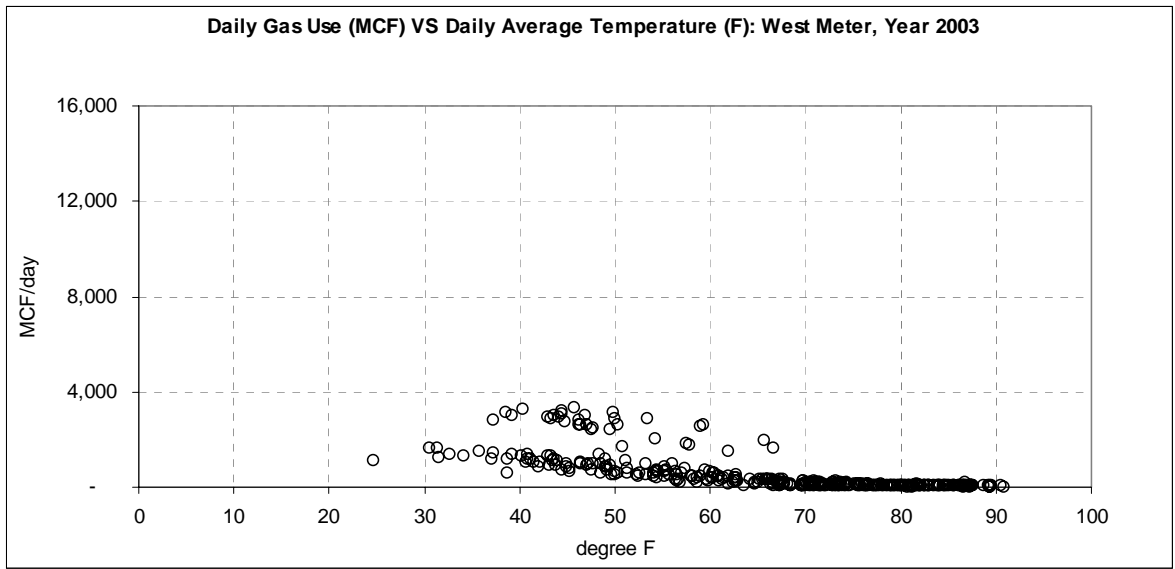


Figure 4-5: 2003 and 2004 Daily Gas Use for West Meter vs Temperature.

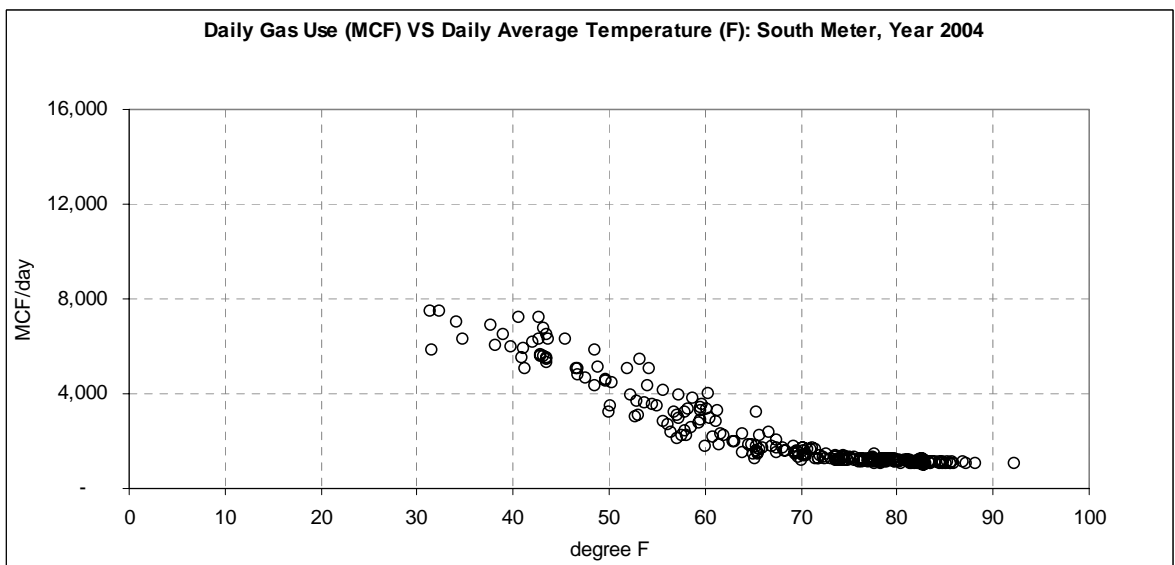
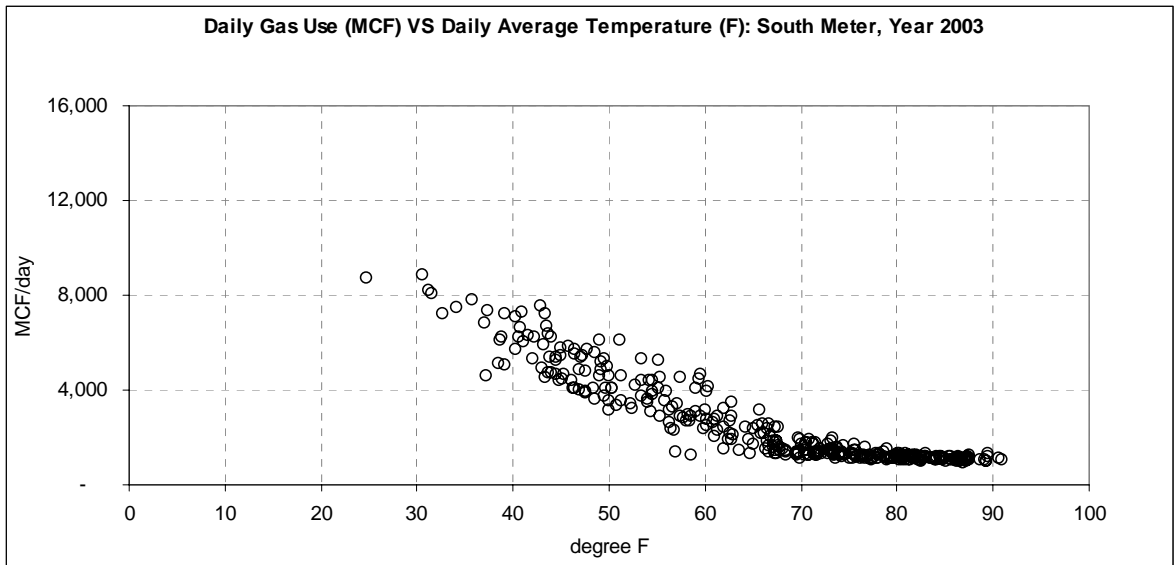


Figure 4-6: 2003 and 2004 Daily Gas Use for South Meter vs Temperature.

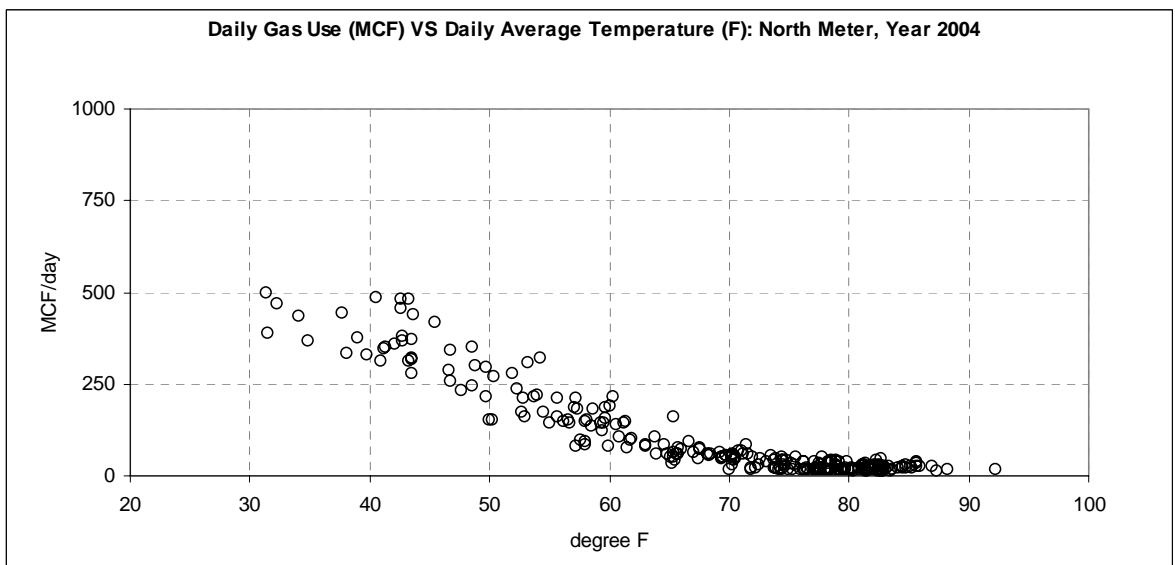
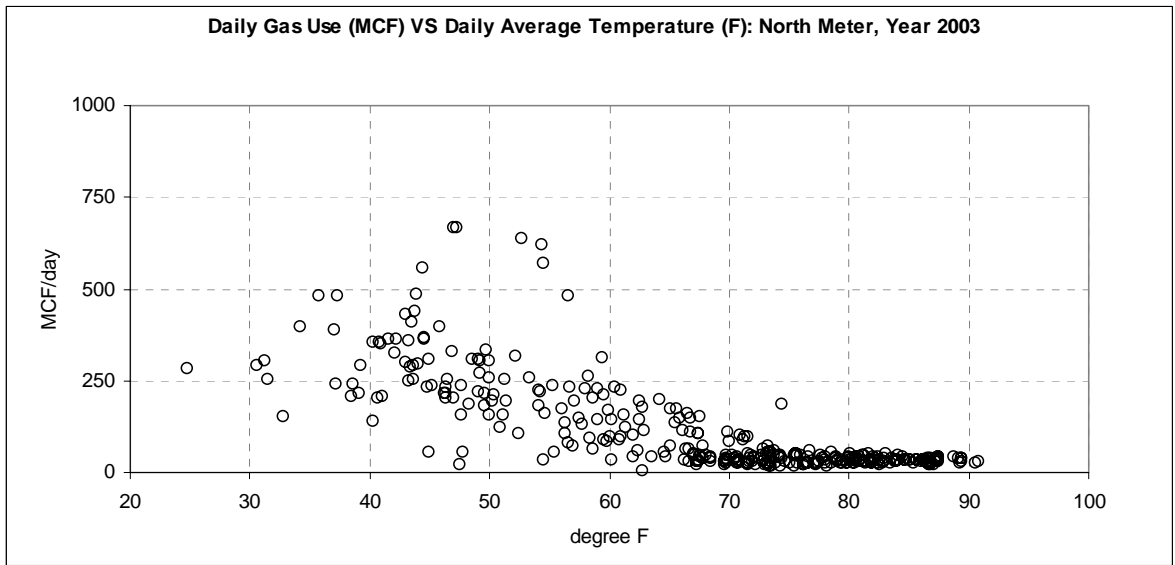


Figure 4-7: 2003 and 2004 Daily Gas Use for North Meter vs Temperature.

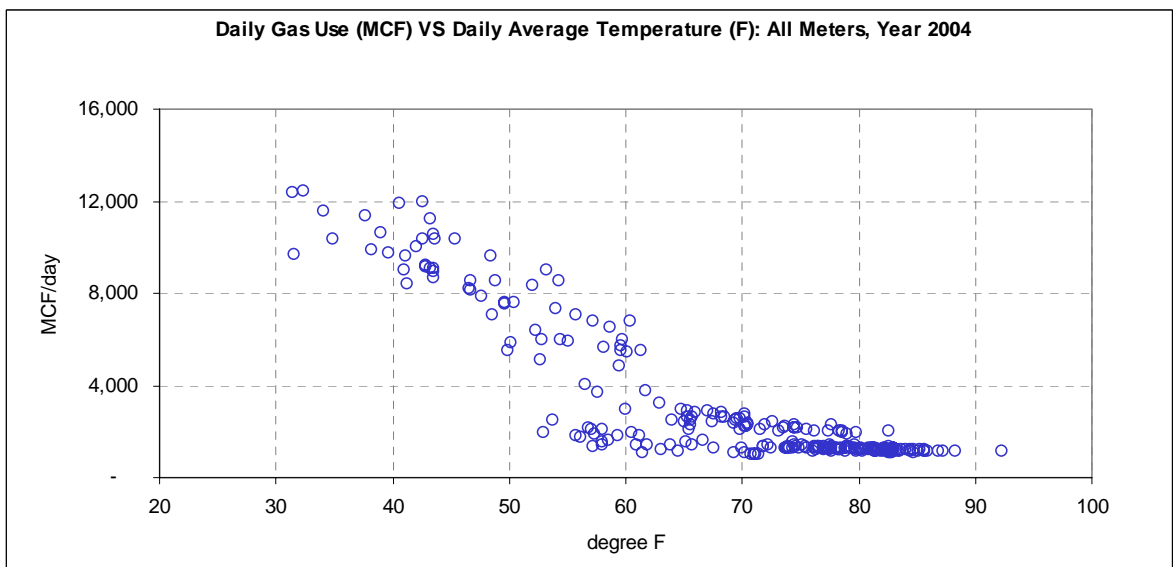
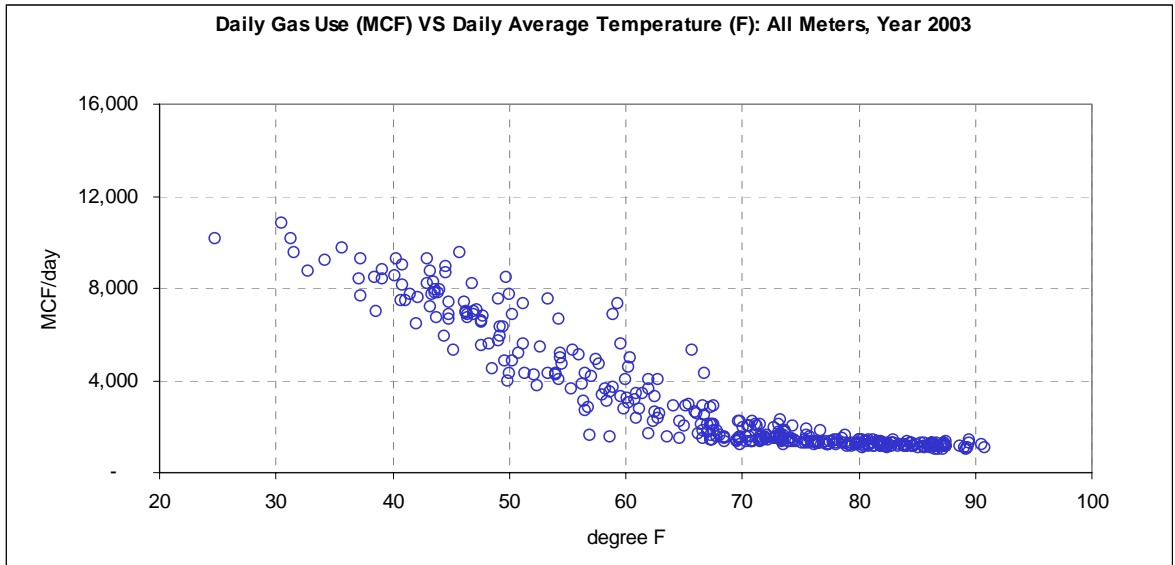


Figure 4-8: 2003 and 2004 Daily Gas Use for All Meters vs Temperature.

5. APPENDIX I ESL POLLING AND DATABASE INFORMATION

This section of the report contains information about the channels that were being monitored at the thermal plant, III Corp building, Darnall Hospital, Main, West and North Electrical Substations.

The following information contains the ESL's Channel Identification Table (CHID) for loggers that have been assigned to the each logger. The numbers in the first column are the channel number of the individual data channels in the ESL's Informix database. The "cp" indicates if the channel is current, followed by the channel description and other information.

The parameter sets for the loggers at the Fort Hood, which were used to collect the data presented in this report are also presented in this section. These parameter sets are current as of 12/2004.

5.1. Channel Identification Tables lstarxp% listchid #938 - 3279 - Ft Hood - Central Thermal Power Plant (87000)

Chid	cp	Description
4342	-1	CHIL 1 ELECTRIC (power, B1C1/B1C1)
4343	-1	CHIL 2 ELECTRIC (power, A1C1/A1C1)
4341	-1	CHIL 1 ELECTRIC (power, A1C1/A1C1)
4344	-1	CHIL 2 ELECTRIC (power, B1C1/B1C1)
4346	-1	BOILER 1 GAS
4345	-1	WHOLE BLDG ELECT
4623	1	CNTRL PLNT ELECT (power, A1N1/A1N1)
4624	2	CNTRL PLNT ELECT (power, B1N1/B1N1)
4625	3	CNTRL PLNT ELECT (power, C1N1/C1N1)
4626	4	CHILLER 1 ELECT (power, A1B1/A1B1)
4627	5	CHILLER 1 ELECT (power, C1B1/C1B1)
4628	6	CHILLER 2 ELECT (power, A1B1/A1B1)
4629	7	CHILLER 2 ELECT (power, C1B1/C1B1)
4630	8	CNTRL PLNT ELECT (kva, A1N1/A1N1)
4631	9	CNTRL PLNT ELECT (kva, B1N1/B1N1)
4632	10	CNTRL PLNT ELECT (kva, C1N1/C1N1)
4633	11	CHILLER 1 ELECT (kva, A1B1/A1B1)
4634	12	CHILLER 1 ELECT (kva, C1B1/C1B1)
4635	13	CHILLER 2 ELECT (kva, A1B1/A1B1)
4636	14	CHILLER 2 ELECT (kva, C1B1/C1B1)
4637	15	CHILLED WTR FLOW
4638	16	CHW SUPPLY TEMP
4639	17	CHW RET TEMP
4640	18	OUTSIDE TEMP
4641	19	OUTSIDE RH
4774	20	STEAM FLOW ENRGY
4775	21	STEAM TEMP
4850	22	STEAM PRESSURE
4851	23	COND WTR RETURN
4642	24	CNTRL PLNT GAS
4643	25	CHILL WTR BTU USR

5.2. Parameter set for the Logger #938 - 3279 - Ft Hood - Central Thermal Power Plant (87000)

***** Configuration for Logger: 03279 Parameter Set Code: a *****

----- INTEGRATION PERIODS -----

	AM							PM																
From:	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
To:	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Flag:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mins:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

----- WATT CHANNELS -----

Chan	Description	STA	Load	Hi	Lo	VMult	Amps	Vlt	Amp	PR	KW	KVA	KWH	KVAH

CT 0	CNTRL PLNT ELECT ON	3P	A1	N1	1.00	1600		0	*	*				
CT 1	CNTRL PLNT ELECT ON	3P	B1	N1	1.00	1600		1	*	*				
CT 2	CNTRL PLNT ELECT ON	3P	C1	N1	1.00	1600		2	*	*				
CT 3	CHILLER 1 ELECT ON	3P	A1	B1	1.00	600		3	*	*				
CT 4	CHILLER 1 ELECT ON	3P	C1	B1	1.00	600		4	*	*				
CT 5	CHILLER 2 ELECT ON	3P	A1	B1	1.00	600		5	*	*				
CT 6	CHILLER 2 ELECT ON	3P	C1	B1	1.00	600		6	*	*				
CT 7	OFF	3P	B1	N1	1.00	100		7						
CT 8	OFF	3P	C1	N1	1.00	100		8						
CT 9	OFF	3P	A1	N1	1.00	100		9						
CT10	OFF	3P	B1	N1	1.00	100		10						
CT11	OFF	3P	C1	N1	1.00	100		11						
CT12	OFF	3P	A1	N1	1.00	100		12						
CT13	OFF	3P	B1	N1	1.00	100		13						
CT14	OFF	3P	C1	N1	1.00	100		14						
CT15	OFF	3P	A1	N1	1.00	100		15						

Chan	Search String	Field Notes

CT 0		
CT 1		
CT 2		
CT 3		
CT 4		
CT 5		
CT 6		
CT 7		
CT 8		
CT 9		
CT10		
CT11		FORT HOOD ARMY BASE, KILLEEN, TEXAS
CT12		CENTRAL PLANT - BLDG 87018
CT13		SITE #938 SERIAL #3279

CT14 PHONE #254-287-2972
 CT15

***** Configuration for Logger: 03279 Parameter Set Code: a *****

----- ANALOG CHANNELS -----

Chan	Description	Search String	STA	Scale	Offset	Units	T	S	G
A 0	CHILLED WTR FLOW		ON	531.25	-425.00	Volts DC	*		
A 1	CHW SUPPLY TEMP		ON	1.00	-1.80	Deg F	*		
A 2	CHW RET TEMP		ON	1.00	-1.80	Deg F	*		
A 3	OUTSIDE TEMP		ON	56.25	-85.00	Volts DC	*		
A 4	OUTSIDE RH		ON	31.25	-25.00	Volts DC	*		
A 5	STEAM FLOW ENRGY		ON	7812.50	-6250.00	Volts DC	*		
A 6	STEAM TEMP		ON	1.00	-1.80	Deg F	*		
A 7	STEAM PRESSURE		ON	15.63	-12.50	Volts DC	*		
A 8	COND WTR RETURN		ON	1.00	0.00	Deg F	*		
A 9		OFF	1.00	0.00					
A 10		OFF	1.00	0.00					
A 11		OFF	1.00	0.00					
A 12		OFF	1.00	0.00					
A 13		OFF	1.00	0.00					
A 14		OFF	1.00	0.00					
A 15	NOT USED!		OFF	-999.00	-999.00				

Chan	CType	Field Notes
A 0	4-20ma	ONICON CHW FLOWMETER 4-20MA OUTPUT
A 1	1K RTD	STD 1000 OHM RTD
A 2	1K RTD	STD 1000 OHM RTD
A 3	4-20ma	VAISALA HUM AND TEMP XMTR MODEL HMD0600Y
A 4	4-20ma	VAISALA HUM AND TEMP XMTR MODEL HMD0600Y
A 5	4-20ma	EMCO VORTEX STEAM METER - VOLUME FLOW OUTPUT 4-20 MA
A 6	1K RTD	1000 OHM RTD INTEGRATED FROM EMCO VORTEX METER
A 7	4-20ma	EMCO VORTEX INTEGRATED PRESSURE XDCR 0-50 PSI
A 8	1K RTD	STD 1000 OHM RTD
A 9	OFF	
A 10	OFF	
A 11	OFF	FORT HOOD ARMY BASE, KILLEEN, TEXAS
A 12	OFF	CENTRAL PLANT - BUILDING # 87018
A 13	OFF	SITE #938 SERIAL# 3279
A 14	OFF	PHONE #254-287-2972
A 15	OFF	

***** Configuration for Logger: 03279 Parameter Set Code: a *****

----- DIGITAL CHANNELS -----

Chan	Description	Search String	STA	Scale	Units	TSR	AVG	RTS
D 0	CNTRL PLNT GAS		ON	1.00	CF			*
D 1		OFF	1.00					
D 2		OFF	1.00					
D 3		OFF	1.00					
D 4		OFF	1.00					
D 5		OFF	1.00					
D 6		OFF	1.00					
D 7		OFF	1.00					
D 8		OFF	1.00					
D 9		OFF	1.00					
D 10		OFF	1.00					
D 11		OFF	1.00					
D 12		OFF	1.00					
D 13		OFF	1.00					
D 14		OFF	1.00					
D 15		OFF	1.00					

Chan	Field Notes
D 0	
D 1	
D 2	
D 3	
D 4	
D 5	
D 6	
D 7	
D 8	
D 9	
D 10	
D 11	
D 12	
D 13	
D 14	
D 15	

Description	Variable	Measurement #
CNTRL PLNT ELECT	KW 0	0
CNTRL PLNT ELECT	KW 1	0
CNTRL PLNT ELECT	KW 2	0
CHILLER 1 ELECT	KW 3	0
CHILLER 1 ELECT	KW 4	0
CHILLER 2 ELECT	KW 5	0
CHILLER 2 ELECT	KW 6	0
CNTRL PLNT ELECT	KV 0	0
CNTRL PLNT ELECT	KV 1	0

CNTRL PLNT ELECT KV 2 0
CHILLER 1 ELECT KV 3 0
CHILLER 1 ELECT KV 4 0
CHILLER 2 ELECT KV 5 0
CHILLER 2 ELECT KV 6 0
CHILLED WTR FLOW AN 0 0
CHW SUPPLY TEMP AN 1 0
CHW RET TEMP AN 2 0
OUTSIDE TEMP AN 3 0
OUTSIDE RH AN 4 0
STEAM FLOW ENRGY AN 5 0
STEAM TEMP AN 6 0
STEAM PRESSURE AN 7 0
COND WTR RETURN AN 8 0
CNTRL PLNT GAS DIG 0 0

5.3. Channel Identification Tables Istaraxp% listchid #947 - 10043 - III Corps

Chid	cp	Description
4776	1	MAIN 1 ELECT (power, A1N1/A1N1)
4777	2	MAIN 1 ELECT (power, B1N1/B1N1)
4778	3	MAIN 1 ELECT (power, C1N1/C1N1)
4779	4	MAIN 2 ELECT (power, A2N2/A2N2)
4780	5	MAIN 2 ELECT (power, B2N2/B2N2)
4781	6	MAIN 2 ELECT (power, C2N2/C2N2)
4782	7	CHILLER 1 ELECT (power, A1B1/A1B1)
4783	8	CHILLER 1 ELECT (power, C1B1/C1B1)
4784	9	CHILLER 2 ELECT (power, A1B1/A1B1)
4785	10	CHILLER 2 ELECT (power, C1B1/C1B1)
4786	11	CHILLER 3 ELECT (power, A1B1/A1B1)
4787	12	CHILLER 3 ELECT (power, C1B1/C1B1)
4788	13	CHILLER 4 ELECT (power, A1B1/A1B1)
4789	14	CHILLER 4 ELECT (power, C1B1/C1B1)
4790	15	MCC ELECT (power, A2B2/A2B2)
4791	16	MCC ELECT (power, C2B2/C2B2)
4792	17	WHOLE BLDG GAS

5.4. Parameter set for the Logger #947 - 10043 - III Corps

***** Configuration for Logger: 10043 Parameter Set Code: a *****

----- INTEGRATION PERIODS -----

	AM		PM																					
From:	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
To:	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Flag:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mins:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

----- WATT CHANNELS -----

Chan	Description	STA	Load	Hi	Lo	VMult	Amps	Vlt	Amp	PR	KW	KVA	KWH	KVAH
CT 0	MAIN 1 ELECT	ON	3P	A1	N1	1.00	4000		0	*				
CT 1	MAIN 1 ELECT	ON	3P	B1	N1	1.00	4000		1	*				
CT 2	MAIN 1 ELECT	ON	3P	C1	N1	1.00	4000		2	*				
CT 3	MAIN 2 ELECT	ON	3P	A2	N2	1.00	4000		3	*				
CT 4	MAIN 2 ELECT	ON	3P	B2	N2	1.00	4000		4	*				
CT 5	MAIN 2 ELECT	ON	3P	C2	N2	1.00	4000		5	*				
CT 6	CHILLER 1 ELECT	ON	3P	A1	B1	1.00	400		6	*				
CT 7	CHILLER 1 ELECT	ON	3P	C1	B1	1.00	400		7	*				
CT 8	CHILLER 2 ELECT	ON	3P	A1	B1	1.00	800		8	*				
CT 9	CHILLER 2 ELECT	ON	3P	C1	B1	1.00	800		9	*				
CT10	CHILLER 3 ELECT	ON	3P	A1	B1	1.00	800		10	*				
CT11	CHILLER 3 ELECT	ON	3P	C1	B1	1.00	800		11	*				
CT12	CHILLER 4 ELECT	ON	3P	A1	B1	1.00	800		12	*				
CT13	CHILLER 4 ELECT	ON	3P	C1	B1	1.00	800		13	*				
CT14	MCC ELECT	ON	3P	A2	B2	1.00	800		14	*				
CT15	MCC ELECT	ON	3P	C2	B2	1.00	800		15	*				

Chan	Search String	Field Notes
CT 0	MAIN CIRCUIT BREAKER #1 A PHASE	
CT 1	MAIN CIRCUIT BREAKER #1 B PHASE	
CT 2	MAIN CIRCUIT BREAKER #1 C PHASE	
CT 3	MAIN CIRCUIT BREAKER #2 A PHASE	
CT 4	MAIN CIRCUIT BREAKER #2 B PHASE	
CT 5	MAIN CIRCUIT BREAKER #2 C PHASE	
CT 6	CHILLER #1 FROM ATS-4 CIRCUIT A PHASE	
CT 7	CHILLER #1 FROM ATS-4 CIRCUIT C PHASE	
CT 8	CHILLER #2 FROM ATS-5 CIRCUIT A PHASE	
CT 9	CHILLER #2 FROM ATS-5 CIRCUIT C PHASE	
CT10	CHILLER #3 FROM ATS-6 CIRCUIT A PHASE	
CT11	CHILLER #3 FROM ATS-6 CIRCUIT C PHASE	
CT12	CHILLER #4 FROM ATS-7 CIRCUIT A PHASE	
CT13	CHILLER #4 FROM ATS-7 CIRCUIT C PHASE	

CT14 MCC FROM ATS-17 CIRCUIT A PHASE
 CT15 MCC FROM ATS-17 CIRCUIT C PHASE

***** Configuration for Logger: 10043 Parameter Set Code: a *****

----- ANALOG CHANNELS -----

Chan	Description	Search String	STA	Scale	Offset	Units	T S G
A 0		OFF	1.00	0.00			
A 1		OFF	1.00	0.00			
A 2		OFF	1.00	0.00			
A 3		OFF	1.00	0.00			
A 4		OFF	1.00	0.00			
A 5		OFF	1.00	0.00			
A 6		OFF	1.00	0.00			
A 7		OFF	1.00	0.00			
A 8		OFF	1.00	0.00			
A 9		OFF	1.00	0.00			
A 10		OFF	1.00	0.00			
A 11		OFF	1.00	0.00			
A 12		OFF	1.00	0.00			
A 13		OFF	1.00	0.00			
A 14		OFF	1.00	0.00			
A 15	NOT USED!	OFF	-999.00	-999.00			

Chan	CType	Field Notes
A 0	OFF	
A 1	OFF	
A 2	OFF	
A 3	OFF	
A 4	OFF	
A 5	OFF	
A 6	OFF	
A 7	OFF	
A 8	OFF	
A 9	OFF	
A 10	OFF	
A 11	OFF	
A 12	OFF	
A 13	OFF	
A 14	OFF	
A 15	OFF	

***** Configuration for Logger: 10043 Parameter Set Code: a *****

---- DIGITAL CHANNELS ----

Chan	Description	Search String	STA	Scale	Units	TSR	AVG	RTS
D 0	WHOLE BLDG GAS		ON	10.00	CFH			*
D 1		OFF	1.00					
D 2		OFF	1.00					
D 3		OFF	1.00					
D 4		OFF	1.00					
D 5		OFF	1.00					
D 6		OFF	1.00					
D 7		OFF	1.00					
D 8		OFF	1.00					
D 9		OFF	1.00					
D 10		OFF	1.00					
D 11		OFF	1.00					
D 12		OFF	1.00					
D 13		OFF	1.00					
D 14		OFF	1.00					
D 15		OFF	1.00					

Chan	Field Notes
D 0	
D 1	
D 2	
D 3	
D 4	
D 5	
D 6	
D 7	
D 8	
D 9	

D 10 FORT HOOD ARMY BASE - III CORPS HEADQUARTERS BUILDING
 D 11 SITE #942 SN 10043
 D 12 PHONE # 254-285-6175
 D 13
 D 14
 D 15

Description	Variable	Measurement #	
MAIN 1 ELECT	KW 0		0
MAIN 1 ELECT	KW 1		0
MAIN 1 ELECT	KW 2		0
MAIN 2 ELECT	KW 3		0
MAIN 2 ELECT	KW 4		0
MAIN 2 ELECT	KW 5		0
CHILLER 1 ELECT	KW 6		0
CHILLER 1 ELECT	KW 7		0
CHILLER 2 ELECT	KW 8		0
CHILLER 2 ELECT	KW 9		0
CHILLER 3 ELECT	KW 10		0
CHILLER 3 ELECT	KW 11		0
CHILLER 4 ELECT	KW 12		0
CHILLER 4 ELECT	KW 13		0
MCC ELECT	KW 14		0
MCC ELECT	KW 15		0
WHOLE BLDG GAS	DIG 0		0

5.5. Channel Identification Tables lstarxp% listchid# 939 - 3832 - Darnall Hospital #1

Chid	cp	Description
4295	1	WBE METER #3
4296	2	WBE METER #4

5.6. Parameter set for the Logger # 939 - 3832 - Darnall Hospital #1

***** Configuration for Logger: 03832 Parameter Set Code: a *****

----- INTEGRATION PERIODS -----

	AM		PM																						
From:	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	
To:	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Flag:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mins:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

----- WATT CHANNELS -----

Chan	Description	STA	Load	Hi	Lo	VMult	Amps	Vlt	Amp	PR	KW	KVA	KWH	KVAH
CT 0	OFF 3P A1 N1	1.00	100	0										
CT 1	OFF 3P B1 N1	1.00	100	1										
CT 2	OFF 3P C1 N1	1.00	100	2										
CT 3	OFF 3P A1 N1	1.00	100	3										
CT 4	OFF 3P B1 N1	1.00	100	4										
CT 5	OFF 3P C1 N1	1.00	100	5										
CT 6	OFF 3P A1 N1	1.00	100	6										
CT 7	OFF 3P B1 N1	1.00	100	7										
CT 8	OFF 3P C1 N1	1.00	100	8										
CT 9	OFF 3P A1 N1	1.00	100	9										
CT10	OFF 3P B1 N1	1.00	100	10										
CT11	OFF 3P C1 N1	1.00	100	11										
CT12	OFF 3P A1 N1	1.00	100	12										
CT13	OFF 3P B1 N1	1.00	100	13										
CT14	OFF 3P C1 N1	1.00	100	14										
CT15	OFF 3P A1 N1	1.00	100	15										

Chan	Search String	Field Notes
CT 0		
CT 1		
CT 2		
CT 3		
CT 4		
CT 5		
CT 6		
CT 7		
CT 8		
CT 9		
CT10		
CT11		
CT12		
CT13		
CT14		
CT15		

***** Configuration for Logger: 03832 Parameter Set Code: a *****

---- ANALOG CHANNELS ----

Chan	Description	Search String	STA	Scale	Offset	Units	T S G
A 0		OFF	1.00	0.00			
A 1		OFF	1.00	0.00			
A 2		OFF	1.00	0.00			
A 3		OFF	1.00	0.00			
A 4		OFF	1.00	0.00			
A 5		OFF	1.00	0.00			
A 6		OFF	1.00	0.00			
A 7		OFF	1.00	0.00			
A 8		OFF	1.00	0.00			
A 9		OFF	1.00	0.00			
A 10		OFF	1.00	0.00			
A 11		OFF	1.00	0.00			
A 12		OFF	1.00	0.00			
A 13		OFF	1.00	0.00			
A 14		OFF	1.00	0.00			
A 15	NOT USED!		OFF	-999.00	-999.00		

Chan	CType	Field Notes
A 0	OFF	
A 1	OFF	
A 2	OFF	
A 3	OFF	
A 4	OFF	
A 5	OFF	
A 6	OFF	
A 7	OFF	
A 8	OFF	
A 9	OFF	
A 10	OFF	
A 11	OFF	
A 12	OFF	
A 13	OFF	
A 14	OFF	
A 15	OFF	

***** Configuration for Logger: 03832 Parameter Set Code: a *****

----- DIGITAL CHANNELS -----

Chan	Description	Search String	STA	Scale	Units	TSR	AVG	RTS
D 0	WBE METER #3		ON	0.86	kW/pulse	*		
D 1	WBE METER #4		ON	0.86	kW/pulse	*		
D 2		OFF	1.00					
D 3		OFF	1.00					
D 4		OFF	1.00					
D 5		OFF	1.00					
D 6		OFF	1.00					
D 7		OFF	1.00					
D 8		OFF	1.00					
D 9		OFF	1.00					
D 10		OFF	1.00					
D 11		OFF	1.00					
D 12		OFF	1.00					
D 13		OFF	1.00					
D 14		OFF	1.00					
D 15		OFF	1.00					

Chan	Field Notes
D 0	Incoming 480vac LINE #3
D 1	Incoming 480vac LINE #4
D 2	Need to verify the 0.864 KW/pulse
D 3	
D 4	
D 5	SSI splitters to share signal from each Electric Meter.
D 6	Transmitter was removed in room EG3, B80 installed
D 7	Data between Jun-Oct 99 used 0.648 and not 0.864
D 8	Hosp Mang Mr. G (RIC) Hodges 286-7318 V,286-8375 F, 903-2665 P
D 9	B80 Data Logger, Room EG3, Modem Line (254)286-7821
D 10	Darnall Army Hospital @ Fort Hood in Killeen, Tx.
D 11	Plant contact: Mr. Leslie (NEIL) Matther (254)288-8770, room 215
D 12	JJ Maintenance from Austin, E. Steiner or D Keller 532-5603
D 13	Chiel Operator Larry Norton control room 286-7088
D 14	Need to register in Room 0407, 288-8770, request a badge
D 15	Carlos Ortiz

Description	Variable	Measurement #
WBE METER #3	DIG 0	0
WBE METER #4	DIG 1	0

5.7. Channel Identification Tables Istaraxp% listchid# 940 - 3831 - Darnall Hosptial #2

Chid	cp	Description
4202	-1	CHILLER#2 RT-TMP
4179	-1	CHILLER #1 ELE A (kva, A1B1/A1B1)
4180	-1	CHILLER #1 ELE C (kva, C1B1/C1B1)
4183	-1	CHILLER #3 ELE A (kva, A1B1/A1B1)
4184	-1	CHILLER #3 ELE C (kva, C1B1/C1B1)
4185	-1	MCC PHASE A (kva, A1B1/A1B1)
4186	-1	MCC PHASE C (kva, C1B1/C1B1)
4187	-1	LIL' MCC PHASE A (kva, A1B1/A1B1)
4188	-1	LIL' MCC PHASE C (kva, C1B1/C1B1)
4189	-1	CHILLER #1 ELE A (volts, A1B1/A1B1)
4190	-1	CHILLER #1 ELE C (volts, C1B1/C1B1)
4191	-1	CHILLER #2 ELE A (volts, A1B1/A1B1)
4192	-1	CHILLER #2 ELE C (volts, C1B1/C1B1)
4193	-1	CHILLER #3 ELE A (volts, A1B1/A1B1)
4194	-1	CHILLER #3 ELE C (volts, C1B1/C1B1)
4195	-1	MCC PHASE A (volts, A1B1/A1B1)
4196	-1	MCC PHASE C (volts, C1B1/C1B1)
4197	-1	LIL' MCC PHASE A (volts, A1B1/A1B1)
4198	-1	LIL' MCC PHASE C (volts, C1B1/C1B1)
4181	-1	CHILLER #2 ELE A (kva, A1B1/A1B1)
4201	-1	CHILLER#2 SP-TMP
4199	-1	CHILLER#1 SP-TMP
4200	-1	CHILLER#1 RT-TMP
4182	-1	CHILLER #2 ELE C (kva, C1B1/C1B1)
4208	-1	WBE METER #4
4207	-1	WBE METER #3
4204	-1	CHILLER#3 RT-TMP
4203	-1	CHILLER#3 SP-TMP
4169	1	CHILLER #1 ELE A (power, A1B1/A1B1)
4170	2	CHILLER #1 ELE C (power, C1B1/C1B1)
4171	3	CHILLER #2 ELE A (power, A1B1/A1B1)
4172	4	CHILLER #2 ELE C (power, C1B1/C1B1)
4173	5	CHILLER #3 ELE A (power, A1B1/A1B1)
4174	6	CHILLER #3 ELE C (power, C1B1/C1B1)
4175	7	MCC PHASE A (power, A1B1/A1B1)
4176	8	MCC PHASE C (power, C1B1/C1B1)
4177	9	LIL' MCC PHASE A (power, A1B1/A1B1)
4178	10	LIL' MCC PHASE C (power, C1B1/C1B1)
4297	11	CHILLER#1 SP-TMP
4298	12	CHILLER#1 RT-TMP
4299	13	CHILLER#2 SP-TMP
4300	14	CHILLER#2 RT-TMP
4301	15	CHILLER#3 SP-TMP
4302	16	CHILLER#3 RT-TMP
4205	17	WBE METER #1
4206	18	WBE METER #2
4303	19	GAS OTHER
4209	20	WBGAS

5.8. Parameter set for the Logger # 940 - 3831 - Darnall Hosptial #2

***** Configuration for Logger: 03831 Parameter Set Code: a *****

----- INTEGRATION PERIODS -----

```

      AM                PM
From: 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11
To:   1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12

Flag: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Mins: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
    
```

----- WATT CHANNELS -----

Chan	Description	STA	Load	Hi	Lo	VMult	Amps	Vlt	Amp	PR	KW	KVA	KWH	KVAH
CT 0	CHILLER #1 ELE A ON	3P	A1	B1	1.00	400	400	0	*					
CT 1	CHILLER #1 ELE C ON	3P	C1	B1	1.00	400	400	1	*					
CT 2	CHILLER #2 ELE A ON	3P	A1	B1	1.00	400	400	2	*					
CT 3	CHILLER #2 ELE C ON	3P	C1	B1	1.00	400	400	3	*					
CT 4	CHILLER #3 ELE A ON	3P	A1	B1	1.00	800	800	4	*					
CT 5	CHILLER #3 ELE C ON	3P	C1	B1	1.00	800	800	5	*					
CT 6	MCC PHASE A ON	3P	A1	B1	1.00	1000	1000	6	*					
CT 7	MCC PHASE C ON	3P	C1	B1	1.00	1000	1000	7	*					
CT 8	LIL' MCC PHASE A ON	3P	A1	B1	1.00	600	600	8	*					
CT 9	LIL' MCC PHASE C ON	3P	C1	B1	1.00	600	600	9	*					
CT10	OFF	3P	B1	N1	1.00	100	100							
CT11	OFF	3P	C1	N1	1.00	100	100							
CT12	OFF	3P	A1	N1	1.00	100	100							
CT13	OFF	3P	B1	N1	1.00	100	100							
CT14	OFF	3P	C1	N1	1.00	100	100							
CT15	OFF	3P	A1	N1	1.00	100	100							

Chan	Search String	Field Notes
CT 0	CHILLER #1 ELECTRIC ENERGY PHASE A	
CT 1	CHILLER #1 ELECTRIC ENERGY PHASE C	
CT 2	CHILLER #2 ELECTRIC ENERGY PHASE A	
CT 3	CHILLER #2 ELECTRIC ENERGY PHASE C	
CT 4	CHILLER #3 ELECTRIC ENERGY PHASE A	
CT 5	CHILLER #3 ELECTRIC ENERGY PHASE C	
CT 6	MAIN MCC #2 (CHW PUMPS & FANS) PHASE A	
CT 7	MAIN MCC #2 (CHW PUMPS & FANS) PHASE C	
CT 8	SMALL MCC #1 (BOILERS & COOLING TOWER) PHASE A	
CT 9	SMALL MCC #1 (BOILERS & COOLING TOWER) PHASE C	
CT10	Temp Loggers 1687a-940A, 3827a,b,c-940B	
CT11	Permanent Logger 3831a, site 940-C	
CT12	Fort Hood Darnall Hospital, Dec 9,1999	

CT13 Log 1687A Jun to Oct, 3827B Nov5-22, 3827C Nov25-Dec9
 CT14 Site 940C upgrade Dec9 new parm 03831A, DOE money
 CT15 Carlos Ortiz

***** Configuration for Logger: 03831 Parameter Set Code: a *****

----- ANALOG CHANNELS -----

Chan	Description	Search String	STA	Scale	Offset	Units	T S G
A 0	CHILLER#1 SP-TMP		ON	20.00	0.00	Deg F	*
A 1	CHILLER#1 RT-TMP		ON	20.00	0.00	Deg F	*
A 2	CHILLER#2 SP-TMP		ON	20.00	0.00	Deg F	*
A 3	CHILLER#2 RT-TMP		ON	20.00	0.00	Deg F	*
A 4	CHILLER#3 SP-TMP		ON	20.00	0.00	Deg F	*
A 5	CHILLER#3 RT-TMP		ON	20.00	0.00	Deg F	*
A 6		OFF	1.00	0.00			
A 7		OFF	1.00	0.00			
A 8		OFF	1.00	0.00			
A 9		OFF	1.00	0.00			
A 10		OFF	1.00	0.00			
A 11		OFF	1.00	0.00			
A 12		OFF	1.00	0.00			
A 13		OFF	1.00	0.00			
A 14		OFF	1.00	0.00			
A 15	NOT USED!	OFF	-999.00	-999.00			

Chan	CType	Field Notes
A 0	0-5VDC	CHILLER #1 SUPPLY TEMPERATURE
A 1	0-5VDC	CHILLER #1 RETURN TEMPERATURE
A 2	0-5VDC	CHILLER #2 SUPPLY TEMPERATURE
A 3	0-5VDC	CHILLER #2 RETURN TEMPERATURE
A 4	0-5VDC	CHILLER #3 SUPPLY TEMPERATURE
A 5	0-5VDC	CHILLER #3 RETURN TEMPERATURE
A 6	OFF	Offset values may need to be included ???
A 7	OFF	EQUATION=20*INPUT
A 8	OFF	0.5V= 10 Deg F
A 9	OFF	5.0V=100 Deg F
A 10	OFF	Chiller #1 are in same Direct Digital Control Center, YORK
A 11	OFF	Chiller #4 is by itself in a YORK DD Control Center
A 12	OFF	
A 13	OFF	Facilities temperature signal shared using a DT13 ESL hardware
A 14	OFF	Located in the two auxiliary ISN panel box.
A 15	OFF	

***** Configuration for Logger: 03831 Parameter Set Code: a *****

----- DIGITAL CHANNELS -----

Chan	Description	Search String	STA	Scale	Units	TSR AVG RTS
D 0	WBE METER #1		ON	0.65	kW/pulse	*
D 1	WBE METER #2		ON	0.65	kW/pulse	*
D 2	METER#3 SITE939		OFF	1.00		
D 3	METER#4 SITE939		OFF	1.00		
D 4	GAS OTHER		ON	1.00	CFxScale	*
D 5	WBGAS		ON	10.00	CF	*
D 6		OFF	1.00			
D 7		OFF	1.00			
D 8		OFF	1.00			
D 9		OFF	1.00			
D 10		OFF	1.00			
D 11		OFF	1.00			
D 12		OFF	1.00			
D 13		OFF	1.00			
D 14		OFF	1.00			
D 15		OFF	1.00			

Chan Field Notes

- D 0 Incoming 480vac LINE #1
- D 1 Incoming 480vac LINE #2
- D 2 See site 939 in room EG3
- D 3 See site 939 in room EG3
- D 4 Bldg Gas,CI#??, SSI-splitter. Turbometer/Pulsmatic 300-2P-1
- D 5 Boiler,CI#10, SSI-splitter. American Meter Co. 1 Rev= 100CF/10pul,Larry
- D 6 Three boilers
- D 7 Logger site 940 located in Plant by Meter #1-#2
- D 8 Logger site 939 located in Elect. room EG3 opposite corner of site 940
- D 9 REGISTER in Room 0407, see Ms. Sherry Bearden 288-8770
- D 10 Hosp Manag Mr. G (RIC) Hodges 286-7318 V, 286-8375 F, 903-2665 P
- D 11 C180E Data Logger, NEW PHONE LINE (254) 286-7619
- D 12 Darnall Army Hospital @ Fort Hood in Killeen, Tx.
- D 13 Plant contact: Mr. Leslie (Neil) Matther (254) 288-8770,room 215
- D 14 J&J Maintenance from Austin. E Steiner or D Keller, 532-5603
- D 15 Chief operator Larry Norton control room 286-7088, NEED BADGE

Description Variable Measurement #

CHILLER #1 ELE A	KW 0	0
CHILLER #1 ELE C	KW 1	0
CHILLER #2 ELE A	KW 2	0
CHILLER #2 ELE C	KW 3	0
CHILLER #3 ELE A	KW 4	0
CHILLER #3 ELE C	KW 5	0
MCC PHASE A	KW 6	0
MCC PHASE C	KW 7	0
LIL' MCC PHASE A	KW 8	0
LIL' MCC PHASE C	KW 9	0
CHILLER#1 SP-TMP	AN 0	0
CHILLER#1 RT-TMP	AN 1	0
CHILLER#2 SP-TMP	AN 2	0

CHILLER#2 RT-TMP AN 3 0
CHILLER#3 SP-TMP AN 4 0
CHILLER#3 RT-TMP AN 5 0
WBE METER #1 DIG 0 0
WBE METER #2 DIG 1 0
GAS OTHER DIG 4 0
WBGAS DIG 5 0

5.9. Channel Identification Tables Istaraxp% listchid#941 - 10147 - Main Electrical Substation #1

Chid	cp	Description
1867	-1	SW 5 B PHASE (power, B1N1/B1N1)
1868	-1	SW 5 C PHASE (power, C1N1/C1N1)
1869	-1	SW 4 A PHASE (power, A1N1/A1N1)
1870	-1	SW 4 B PHASE (power, B1N1/B1N1)
1871	-1	SW 4 C PHASE (power, C1N1/C1N1)
1872	-1	SW 15 A PHASE (power, A1N1/A1N1)
1873	-1	SW 15 C PHASE (power, B1N1/B1N1)
1874	-1	SW 15 C PHASE (power, C1N1/C1N1)
1875	-1	SW 12 A PHASE (power, A1N1/A1N1)
1876	-1	SW 12 B PHASE (power, B1N1/B1N1)
1877	-1	SW 12 C PHASE (power, C1N1/C1N1)
1878	-1	SW 3 A PHASE (power, A2N1/A2N1)
1879	-1	SW 3 B PHASE (power, B2N1/B2N1)
1880	-1	SW 3 C PHASE (power, C2N1/C2N1)
1881	-1	SW 5 A PHASE (kva, A1N1/A1N1)
1882	-1	SW 5 B PHASE (kva, B1N1/B1N1)
1883	-1	SW 5 C PHASE (kva, C1N1/C1N1)
1884	-1	SW 4 A PHASE (kva, A1N1/A1N1)
1885	-1	SW 4 B PHASE (kva, B1N1/B1N1)
1886	-1	SW 4 C PHASE (kva, C1N1/C1N1)
1887	-1	SW 15 A PHASE (kva, A1N1/A1N1)
1888	-1	SW 15 C PHASE (kva, B1N1/B1N1)
1889	-1	SW 15 C PHASE (kva, C1N1/C1N1)
1890	-1	SW 12 A PHASE (kva, A1N1/A1N1)
1891	-1	SW 12 B PHASE (kva, B1N1/B1N1)
1892	-1	SW 12 C PHASE (kva, C1N1/C1N1)
1893	-1	SW 3 A PHASE (kva, A2N1/A2N1)
1894	-1	SW 3 B PHASE (kva, B2N1/B2N1)
1895	-1	SW 3 C PHASE (kva, C2N1/C2N1)
1896	-1	SW 5 A PHASE (volts, A1N1/A1N1)
1897	-1	SW 5 B PHASE (volts, B1N1/B1N1)
1898	-1	SW 5 C PHASE (volts, C1N1/C1N1)
1899	-1	SW 3 A PHASE (volts, A2N1/A2N1)
1900	-1	SW 3 B PHASE (volts, B2N1/B2N1)
1901	-1	SW 3 C PHASE (volts, C2N1/C2N1)
4826	-1	CIRCUIT BKR 6
4814	-1	CIRCUIT BKR 5
4815	-1	CIRCUIT BKR 4
4816	-1	CIRCUIT BKR 8
4817	-1	CIRCUIT BKR 15
4818	-1	CIRCUIT BKR 12
4819	-1	CIRCUIT BKR 3
4820	-1	CIRCUIT BKR 10
1866	-1	SW 5 A PHASE (power, A1N1/A1N1)
4821	-1	CIRCUIT BKR 2
4903	-1	CIRCUIT BKR 13 (amps, A1N1/A1N1)
4822	-1	CIRCUIT BKR 11
4823	-1	CIRCUIT BKR 9
4824	-1	CIRCUIT BKR 13
4825	-1	CIRCUIT BKR 1
4827	-1	CIRCUIT BKR 7
4828	-1	CIRCUIT BKR 14

4829 -1 CIRCUIT BKR 16
4884 -1 CIRCUIT BKR 13 (power, A1N1/A1N1)
4869 1 CIRCUIT BKR 5 (power, A1N1/A1N1)
4870 2 CIRCUIT BKR 5 (power, B1N1/B1N1)
4871 3 CIRCUIT BKR 5 (power, C1N1/C1N1)
4872 4 CIRCUIT BKR 4 (power, A1N1/A1N1)
4873 5 CIRCUIT BKR 4 (power, B1N1/B1N1)
4874 6 CIRCUIT BKR 4 (power, C1N1/C1N1)
4875 7 CIRCUIT BKR 8 (power, A1N1/A1N1)
4876 8 CIRCUIT BKR 8 (power, B1N1/B1N1)
4877 9 CIRCUIT BKR 8 (power, C1N1/C1N1)
4878 10 CIRCUIT BKR 15 (power, A1N1/A1N1)
4879 11 CIRCUIT BKR 15 (power, B1N1/B1N1)
4880 12 CIRCUIT BKR 15 (power, C1N1/C1N1)
4881 13 CIRCUIT BKR 12 (power, A1N1/A1N1)
4882 14 CIRCUIT BKR 12 (power, B1N1/B1N1)
4883 15 CIRCUIT BKR 12 (power, C1N1/C1N1)
4947 16 CIRCUIT BKR 3 (power, A1N1/A1N1)
4885 17 CIRCUIT BKR 5 (volts, A1N1/A1N1)
4886 18 CIRCUIT BKR 5 (volts, B1N1/B1N1)
4887 19 CIRCUIT BKR 5 (volts, C1N1/C1N1)
4888 20 CIRCUIT BKR 5 (amps, A1N1/A1N1)
4889 21 CIRCUIT BKR 5 (amps, B1N1/B1N1)
4890 22 CIRCUIT BKR 5 (amps, C1N1/C1N1)
4891 23 CIRCUIT BKR 4 (amps, A1N1/A1N1)
4892 24 CIRCUIT BKR 4 (amps, B1N1/B1N1)
4893 25 CIRCUIT BKR 4 (amps, C1N1/C1N1)
4894 26 CIRCUIT BKR 8 (amps, A1N1/A1N1)
4895 27 CIRCUIT BKR 8 (amps, B1N1/B1N1)
4896 28 CIRCUIT BKR 8 (amps, C1N1/C1N1)
4897 29 CIRCUIT BKR 15 (amps, A1N1/A1N1)
4898 30 CIRCUIT BKR 15 (amps, B1N1/B1N1)
4899 31 CIRCUIT BKR 15 (amps, C1N1/C1N1)
4900 32 CIRCUIT BKR 12 (amps, A1N1/A1N1)
4901 33 CIRCUIT BKR 12 (amps, B1N1/B1N1)
4902 34 CIRCUIT BKR 12 (amps, C1N1/C1N1)
4948 35 CIRCUIT BKR 3 (amps, A1N1/A1N1)

5.10. Parameter set for the Logger #941 - 10147 - Main Electrical Substation #1

***** Configuration for Logger: 01141 Parameter Set Code: B *****

----- INTEGRATION PERIODS -----

```

      AM                PM
From: 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11
To:   1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12

Flag: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Mins: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
    
```

----- WATT CHANNELS -----

Chan	Description	Search String	STA	Hi	Lo	VMult	Amps	V	C	PR	P	A
CT 0	CIRCUIT BKR 5	CB5 A POWER	ON	A1	N1	1.0	600	*	*	0	*	
CT 1	CIRCUIT BKR 5	CB5 B POWER	ON	B1	N1	1.0	600	*	*	1	*	
CT 2	CIRCUIT BKR 5	CB5 C POWER	ON	C1	N1	1.0	600	*	*	2	*	
CT 3	CIRCUIT BKR 4	CB4 A POWER	ON	A1	N1	1.0	600	*		3	*	
CT 4	CIRCUIT BKR 4	CB4 B POWER	ON	B1	N1	1.0	600	*		4	*	
CT 5	CIRCUIT BKR 4	CB4 C POWER	ON	C1	N1	1.0	600	*		5	*	
CT 6	CIRCUIT BKR 8	CB8 A POWER	ON	A1	N1	1.0	600	*		6	*	
CT 7	CIRCUIT BKR 8	CB8 B POWER	ON	B1	N1	1.0	600	*		7	*	
CT 8	CIRCUIT BKR 8	CB8 C POWER	ON	C1	N1	1.0	600	*		8	*	
CT 9	CIRCUIT BKR 15	CB15 A POWER	ON	A1	N1	1.0	600	*		9	*	
CT10	CIRCUIT BKR 15	CB15 B POWER	ON	B1	N1	1.0	600	*		10	*	
CT11	CIRCUIT BKR 15	CB15 C POWER	ON	C1	N1	1.0	600	*		11	*	
CT12	CIRCUIT BKR 12	CB12 A POWER	ON	A1	N1	1.0	600	*		12	*	
CT13	CIRCUIT BKR 12	CB12 B POWER	ON	B1	N1	1.0	600	*		13	*	
CT14	CIRCUIT BKR 12	CB12 C POWER	ON	C1	N1	1.0	600	*		14	*	
CT15	CIRCUIT BKR 3	CB13 A POWER	ON	A1	N1	1.0	600	*		15	*	

Chan	Field Notes
CT 0	
CT 1	
CT 2	
CT 3	
CT 4	
CT 5	
CT 6	
CT 7	
CT 8	
CT 9	
CT10	

CT11
 CT12
 CT13
 CT14
 CT15

***** Configuration for Logger: 01141 Parameter Set Code: B *****

---- ANALOG CHANNELS ----

Chan	Description	Search String	STA	Scale	Offset	Units	T S G
A 0		OFF	1.00	0.00			
A 1		OFF	1.00	0.00			
A 2		OFF	1.00	0.00			
A 3		OFF	1.00	0.00			
A 4		OFF	1.00	0.00			
A 5		OFF	1.00	0.00			
A 6		OFF	1.00	0.00			
A 7		OFF	1.00	0.00			
A 8		OFF	1.00	0.00			
A 9		OFF	1.00	0.00			
A 10		OFF	1.00	0.00			
A 11		OFF	1.00	0.00			
A 12		OFF	1.00	0.00			
A 13		OFF	1.00	0.00			
A 14		OFF	1.00	0.00			
A 15	NOT USED!	OFF	-999.00	-999.00			

Chan	CType	Field Notes
A 0	OFF	
A 1	OFF	
A 2	OFF	
A 3	OFF	
A 4	OFF	
A 5	OFF	
A 6	OFF	
A 7	OFF	
A 8	OFF	
A 9	OFF	
A 10	OFF	
A 11	OFF	
A 12	OFF	
A 13	OFF	
A 14	OFF	
A 15	OFF	

***** Configuration for Logger: 01141 Parameter Set Code: B *****

----- DIGITAL CHANNELS -----

Chan	Description	Search String	STA	Scale	Units	TSR	AVG	RTS
D 0	CIRCUIT BKR 5	CB5		OFF	120.00	KWH		
D 1	CIRCUIT BKR 4	CB4		OFF	120.00	KWH		
D 2	CIRCUIT BKR 8	CB8		OFF	120.00	KWH		
D 3	CIRCUIT BKR 15	CB15		OFF	120.00	KWH		
D 4	CIRCUIT BKR 12	CB12		OFF	120.00	KWH		
D 5	CIRCUIT BKR 3	CB3		OFF	120.00	KWH		
D 6	CIRCUIT BKR 10	CB10		OFF	120.00	KWH		
D 7	CIRCUIT BKR 2	CB2		OFF	120.00	KWH		
D 8	CIRCUIT BKR 11	CB11		OFF	120.00	KWH		
D 9	CIRCUIT BKR 9	CB9		OFF	120.00	KWH		
D 10	CIRCUIT BKR 13	CB13		OFF	120.00	KWH		
D 11	CIRCUIT BKR 1	CB1		OFF	120.00	KWH		
D 12	CIRCUIT BKR 6	CB6		OFF	120.00	KWH		
D 13	CIRCUIT BKR 7	CB7		OFF	120.00	KWH		
D 14	CIRCUIT BKR 14	CB14		OFF	120.00	KWH		
D 15	CIRCUIT BKR 16	CB16		OFF	120.00	KWH		

Chan	Field Notes
D 0	
D 1	
D 2	
D 3	
D 4	
D 5	
D 6	
D 7	
D 8	
D 9	
D 10	
D 11	FORT HOOD ARMY BASE, KILLEEN, TEXAS
D 12	SITE #941 SERIAL # 1141 REVISED 05/21/02
D 13	MAIN ELECTRICAL SUBSTATION
D 14	LOGGER 1 OF 3
D 15	PHONE # 254-288-6122

Description	Variable	Measurement #
CIRCUIT BKR 5	KW 0	1
CIRCUIT BKR 5	KW 1	2
CIRCUIT BKR 5	KW 2	3
CIRCUIT BKR 4	KW 3	4
CIRCUIT BKR 4	KW 4	5
CIRCUIT BKR 4	KW 5	6
CIRCUIT BKR 8	KW 6	7
CIRCUIT BKR 8	KW 7	8
CIRCUIT BKR 8	KW 8	9
CIRCUIT BKR 15	KW 9	10
CIRCUIT BKR 15	KW 10	11

CIRCUIT BKR 15	KW 11	12
CIRCUIT BKR 12	KW 12	13
CIRCUIT BKR 12	KW 13	14
CIRCUIT BKR 12	KW 14	15
CIRCUIT BKR 3	KW 15	0
CIRCUIT BKR 5	VOLT 0	1
CIRCUIT BKR 5	VOLT 1	2
CIRCUIT BKR 5	VOLT 2	3

5.11. Channel Identification Tables Istaraxp% listchid#946 - 10148 - Main Electrical Substation #2

Chid	cp	Description
1903	-1	SW 10 B PHASE (power, B2N2/B2N2)
1904	-1	SW 10 B PHASE (power, C2N2/C2N2)
1905	-1	SW 2 A PHASE (power, A2N2/A2N2)
1906	-1	SW 2 B PHASE (power, B2N2/B2N2)
1907	-1	SW 2 C PHASE (power, C2N2/C2N2)
1908	-1	SW 11 A PHASE (power, A1N1/A1N1)
1909	-1	SW 11 B PHASE (power, B1N1/B1N1)
1910	-1	SW 11 C PHASE (power, C1N1/C1N1)
1911	-1	SW 9 A PHASE (power, A1N1/A1N1)
1912	-1	SW 9 B PHASE (power, B1N1/B1N1)
1913	-1	SW 9 C PHASE (power, C1N1/C1N1)
1914	-1	SW 13 C PHASE (power, C1N1/C1N1)
1915	-1	SW 13 B PHASE (power, B1N1/B1N1)
1916	-1	SW 13 A PHASE (power, A1N1/A1N1)
1917	-1	SW 10 A PHASE (kva, A2N2/A2N2)
1918	-1	SW 10 B PHASE (kva, B2N2/B2N2)
1919	-1	SW 10 B PHASE (kva, C2N2/C2N2)
1920	-1	SW 2 A PHASE (kva, A2N2/A2N2)
1921	-1	SW 2 B PHASE (kva, B2N2/B2N2)
1922	-1	SW 2 C PHASE (kva, C2N2/C2N2)
1923	-1	SW 11 A PHASE (kva, A1N1/A1N1)
1924	-1	SW 11 B PHASE (kva, B1N1/B1N1)
1925	-1	SW 11 C PHASE (kva, C1N1/C1N1)
1926	-1	SW 9 A PHASE (kva, A1N1/A1N1)
1927	-1	SW 9 B PHASE (kva, B1N1/B1N1)
1928	-1	SW 9 C PHASE (kva, C1N1/C1N1)
1929	-1	SW 13 C PHASE (kva, C1N1/C1N1)
1930	-1	SW 13 B PHASE (kva, B1N1/B1N1)
1931	-1	SW 13 A PHASE (kva, A1N1/A1N1)
1932	-1	SW 10 A PHASE (volts, A2N2/A2N2)
1933	-1	SW 10 B PHASE (volts, B2N2/B2N2)
1934	-1	SW 10 B PHASE (volts, C2N2/C2N2)
1935	-1	SW 11 A PHASE (volts, A1N1/A1N1)
1936	-1	SW 11 B PHASE (volts, B1N1/B1N1)
1937	-1	SW 11 C PHASE (volts, C1N1/C1N1)
4830	-1	TOTALIZING CB 1
1902	-1	SW 10 A PHASE (power, A2N2/A2N2)
4831	-1	TOTALIZING CB 3
4833	-1	TOTALIZING CB 4
4832	-1	TOTALIZING CB 2
4904	1	CIRCUIT BKR 3 (power, B1N1/B1N1)
4905	2	CIRCUIT BKR 3 (power, C1N1/C1N1)
4906	3	CIRCUIT BKR 10 (power, A1N1/A1N1)
4907	4	CIRCUIT BKR 10 (power, B1N1/B1N1)
4908	5	CIRCUIT BKR 10 (power, C1N1/C1N1)
4909	6	CIRCUIT BKR 2 (power, A1N1/A1N1)
4910	7	CIRCUIT BKR 2 (power, B1N1/B1N1)
4911	8	CIRCUIT BKR 2 (power, C1N1/C1N1)
4912	9	CIRCUIT BKR 11 (power, A1N1/A1N1)
4913	10	CIRCUIT BKR 11 (power, B1N1/B1N1)
4914	11	CIRCUIT BKR 11 (power, C1N1/C1N1)
4915	12	CIRCUIT BKR 9 (power, A1N1/A1N1)

4916	13	CIRCUIT BKR 9	(power, B1N1/B1N1)
4917	14	CIRCUIT BKR 9	(power, C1N1/C1N1)
4918	15	CIRCUIT BKR 13	(power, A1N1/A1N1)
4919	16	CIRCUIT BKR 13	(power, B1N1/B1N1)
4920	17	CIRCUIT BKR 3	(volts, B1N1/B1N1)
4921	18	CIRCUIT BKR 3	(volts, C1N1/C1N1)
4922	19	CIRCUIT BKR 10	(volts, A1N1/A1N1)
4923	20	CIRCUIT BKR 3	(amps, B1N1/B1N1)
4924	21	CIRCUIT BKR 3	(amps, C1N1/C1N1)
4925	22	CIRCUIT BKR 10	(amps, A1N1/A1N1)
4926	23	CIRCUIT BKR 10	(amps, B1N1/B1N1)
4927	24	CIRCUIT BKR 10	(amps, C1N1/C1N1)
4928	25	CIRCUIT BKR 2	(amps, A1N1/A1N1)
4929	26	CIRCUIT BKR 2	(amps, B1N1/B1N1)
4930	27	CIRCUIT BKR 2	(amps, C1N1/C1N1)
4931	28	CIRCUIT BKR 11	(amps, A1N1/A1N1)
4932	29	CIRCUIT BKR 11	(amps, B1N1/B1N1)
4933	30	CIRCUIT BKR 11	(amps, C1N1/C1N1)
4934	31	CIRCUIT BKR 9	(amps, A1N1/A1N1)
4935	32	CIRCUIT BKR 9	(amps, B1N1/B1N1)
4936	33	CIRCUIT BKR 9	(amps, C1N1/C1N1)
4937	34	CIRCUIT BKR 13	(amps, A1N1/A1N1)
4938	35	CIRCUIT BKR 13	(amps, B1N1/B1N1)

5.12. Parameter set for the Logger #946 - 10148 - Main Electrical Substation #2

***** Configuration for Logger: 10148 Parameter Set Code: a *****

----- INTEGRATION PERIODS -----

	AM		PM																					
From:	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
To:	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Flag:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mins:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

----- WATT CHANNELS -----

Chan	Description	STA	Load	Hi	Lo	VMult	Amps	Vlt	Amp	PR	KW	KVA	KWH	KVAH
CT 0	CIRCUIT BKR 3	ON	3P	B1	N1	1.00	600	*	*	0	*			
CT 1	CIRCUIT BKR 3	ON	3P	C1	N1	1.00	600	*	*	1	*			
CT 2	CIRCUIT BKR 10	ON	3P	A1	N1	1.00	600	*	*	2	*			
CT 3	CIRCUIT BKR 10	ON	3P	B1	N1	1.00	600		*	3	*			
CT 4	CIRCUIT BKR 10	ON	3P	C1	N1	1.00	600		*	4	*			
CT 5	CIRCUIT BKR 2	ON	3P	A1	N1	1.00	600		*	5	*			
CT 6	CIRCUIT BKR 2	ON	3P	B1	N1	1.00	600		*	6	*			
CT 7	CIRCUIT BKR 2	ON	3P	C1	N1	1.00	600		*	7	*			
CT 8	CIRCUIT BKR 11	ON	3P	A1	N1	1.00	600		*	8	*			
CT 9	CIRCUIT BKR 11	ON	3P	B1	N1	1.00	600		*	9	*			
CT10	CIRCUIT BKR 11	ON	3P	C1	N1	1.00	600		*	10	*			
CT11	CIRCUIT BKR 9	ON	3P	A1	N1	1.00	600		*	11	*			
CT12	CIRCUIT BKR 9	ON	3P	B1	N1	1.00	600		*	12	*			
CT13	CIRCUIT BKR 9	ON	3P	C1	N1	1.00	600		*	13	*			
CT14	CIRCUIT BKR 13	ON	3P	A1	N1	1.00	600		*	14	*			
CT15	CIRCUIT BKR 13	ON	3P	B1	N1	1.00	600		*	15	*			

Chan	Search String	Field Notes
CT 0		
CT 1		
CT 2		
CT 3		
CT 4		
CT 5		
CT 6		
CT 7		
CT 8		
CT 9		
CT10		FORT HOOD MAIN SUBSTATION BLDG 100
CT11		SITE # 952 SERIAL # 10148

CT12 PHONE # 254-288-6122
 CT13 LOGGER 2 OF 3
 CT14
 CT15

***** Configuration for Logger: 10148 Parameter Set Code: a *****

----- ANALOG CHANNELS -----

Chan	Description	Search String	STA	Scale	Offset	Units	T S G
A 0		OFF	1.00	0.00			
A 1		OFF	1.00	0.00			
A 2		OFF	1.00	0.00			
A 3		OFF	1.00	0.00			
A 4		OFF	1.00	0.00			
A 5		OFF	1.00	0.00			
A 6		OFF	1.00	0.00			
A 7		OFF	1.00	0.00			
A 8		OFF	1.00	0.00			
A 9		OFF	1.00	0.00			
A 10		OFF	1.00	0.00			
A 11		OFF	1.00	0.00			
A 12		OFF	1.00	0.00			
A 13		OFF	1.00	0.00			
A 14		OFF	1.00	0.00			
A 15	NOT USED!	OFF	-999.00	-999.00			

Chan	CType	Field Notes
A 0	OFF	
A 1	OFF	
A 2	OFF	
A 3	OFF	
A 4	OFF	
A 5	OFF	
A 6	OFF	
A 7	OFF	
A 8	OFF	
A 9	OFF	
A 10	OFF	
A 11	OFF	
A 12	OFF	
A 13	OFF	
A 14	OFF	
A 15	OFF	

***** Configuration for Logger: 10148 Parameter Set Code: a *****

----- DIGITAL CHANNELS -----

Chan	Description	Search String	STA	Scale	Units	TSR	AVG	RTS
------	-------------	---------------	-----	-------	-------	-----	-----	-----

D 0	OFF	1.00
D 1	OFF	1.00
D 2	OFF	1.00
D 3	OFF	1.00
D 4	OFF	1.00
D 5	OFF	1.00
D 6	OFF	1.00
D 7	OFF	1.00
D 8	OFF	1.00
D 9	OFF	1.00
D 10	OFF	1.00
D 11	OFF	1.00
D 12	OFF	1.00
D 13	OFF	1.00
D 14	OFF	1.00
D 15	OFF	1.00

Chan Field Notes

- D 0
- D 1
- D 2
- D 3
- D 4
- D 5
- D 6
- D 7
- D 8
- D 9
- D 10
- D 11
- D 12
- D 13
- D 14
- D 15

Description Variable Measurement #

CIRCUIT BKR 3	KW 0	0
CIRCUIT BKR 3	KW 1	0
CIRCUIT BKR 10	KW 2	0
CIRCUIT BKR 10	KW 3	0
CIRCUIT BKR 10	KW 4	0
CIRCUIT BKR 2	KW 5	0
CIRCUIT BKR 2	KW 6	0
CIRCUIT BKR 2	KW 7	0
CIRCUIT BKR 11	KW 8	0
CIRCUIT BKR 11	KW 9	0
CIRCUIT BKR 11	KW 10	0
CIRCUIT BKR 9	KW 11	0
CIRCUIT BKR 9	KW 12	0
CIRCUIT BKR 9	KW 13	0

CIRCUIT BKR 13	KW 14	0
CIRCUIT BKR 13	KW 15	0
CIRCUIT BKR 3	VOLT 0	0
CIRCUIT BKR 3	VOLT 1	0
CIRCUIT BKR 10	VOLT 2	0
CIRCUIT BKR 3	AMP 0	0
CIRCUIT BKR 3	AMP 1	0
CIRCUIT BKR 10	AMP 2	0
CIRCUIT BKR 10	AMP 3	0
CIRCUIT BKR 10	AMP 4	0
CIRCUIT BKR 2	AMP 5	0
CIRCUIT BKR 2	AMP 6	0
CIRCUIT BKR 2	AMP 7	0
CIRCUIT BKR 11	AMP 8	0
CIRCUIT BKR 11	AMP 9	0
CIRCUIT BKR 11	AMP 10	0
CIRCUIT BKR 9	AMP 11	0
CIRCUIT BKR 9	AMP 12	0
CIRCUIT BKR 9	AMP 13	0
CIRCUIT BKR 13	AMP 14	0
CIRCUIT BKR 13	AMP 15	0

5.13. Channel Identification Tables Istaraxp% listchid#948 - 10149 - Central Elect Power Plant (Main Substation #3)

Chid	cp	Description	
1939	-1	SW 1 B PHASE	(power, B1N1/B1N1)
1940	-1	SW 1 C PHASE	(power, C1N1/C1N1)
1941	-1	SW 6 A PHASE	(power, A1N1/A1N1)
1942	-1	SW 6 B PHASE	(power, B1N1/B1N1)
1943	-1	SW 6 C PHASE	(power, C1N1/C1N1)
1944	-1	SW 7 A PHASE	(power, A2N1/A2N1)
1945	-1	SW 7 B PHASE	(power, B2N1/B2N1)
1946	-1	SW 7 C PHASE	(power, C2N1/C2N1)
1947	-1	SW 14 A PHASE	(power, A2N1/A2N1)
1948	-1	SW 14 B PHASE	(power, B2N1/B2N1)
1949	-1	SW 14 C PHASE	(power, C2N1/C2N1)
1950	-1	SW 16 A PHASE	(power, A2N1/A2N1)
1951	-1	SW 16 B PHASE	(power, B2N1/B2N1)
1952	-1	SW 16 C PHASE	(power, C2N1/C2N1)
1953	-1	SW 1 A PHASE	(kva, A1N1/A1N1)
1954	-1	SW 1 B PHASE	(kva, B1N1/B1N1)
1955	-1	SW 1 C PHASE	(kva, C1N1/C1N1)
1956	-1	SW 6 A PHASE	(kva, A1N1/A1N1)
1957	-1	SW 6 B PHASE	(kva, B1N1/B1N1)
1958	-1	SW 6 C PHASE	(kva, C1N1/C1N1)
1959	-1	SW 7 A PHASE	(kva, A2N1/A2N1)
1960	-1	SW 7 B PHASE	(kva, B2N1/B2N1)
1961	-1	SW 7 C PHASE	(kva, C2N1/C2N1)
1962	-1	SW 14 A PHASE	(kva, A2N1/A2N1)
1963	-1	SW 14 B PHASE	(kva, B2N1/B2N1)
1964	-1	SW 14 C PHASE	(kva, C2N1/C2N1)
1965	-1	SW 16 A PHASE	(kva, A2N1/A2N1)
1966	-1	SW 16 B PHASE	(kva, B2N1/B2N1)
1967	-1	SW 16 C PHASE	(kva, C2N1/C2N1)
1968	-1	SW 1 A PHASE	(volts, A1N1/A1N1)
1969	-1	SW 1 B PHASE	(volts, B1N1/B1N1)
1970	-1	SW 1 C PHASE	(volts, C1N1/C1N1)
1971	-1	SW 7 A PHASE	(volts, A2N1/A2N1)
1972	-1	SW 7 B PHASE	(volts, B2N1/B2N1)
1938	-1	SW 1 A PHASE	(power, A1N1/A1N1)
1973	-1	SW 7 C PHASE	(volts, C2N1/C2N1)
4949	1	CIRCUIT BKR 13	(power, C1N1/C1N1)
4950	2	CIRCUIT BKR 1	(power, A1N1/A1N1)
4951	3	CIRCUIT BKR 1	(power, B1N1/B1N1)
4952	4	CIRCUIT BKR 1	(power, C1N1/C1N1)
4953	5	CIRCUIT BKR 6	(power, A1N1/A1N1)
4954	6	CIRCUIT BKR 6	(power, B1N1/B1N1)
4955	7	CIRCUIT BKR 6	(power, C1N1/C1N1)
4956	8	CIRCUIT BKR 7	(power, A1N1/A1N1)
4957	9	CIRCUIT BKR 7	(power, B1N1/B1N1)
4958	10	CIRCUIT BKR 7	(power, C1N1/C1N1)
4959	11	CIRCUIT BKR 14	(power, A1N1/A1N1)
4960	12	CIRCUIT BKR 14	(power, B1N1/B1N1)
4961	13	CIRCUIT BKR 14	(power, C1N1/C1N1)
4962	14	CIRCUIT BKR 16	(power, A1N1/A1N1)
4963	15	CIRCUIT BKR 16	(power, B1N1/B1N1)

4964 16 CIRCUIT BKR 16 (power, C1N1/C1N1)
4965 17 CIRCUIT BKR 13 (volts, C1N1/C1N1)
4966 18 CIRCUIT BKR 1 (volts, A1N1/A1N1)
4967 19 CIRCUIT BKR 1 (volts, B1N1/B1N1)
4968 20 CIRCUIT BKR 13 (amps, C1N1/C1N1)
4969 21 CIRCUIT BKR 1 (amps, A1N1/A1N1)
4970 22 CIRCUIT BKR 1 (amps, B1N1/B1N1)
4971 23 CIRCUIT BKR 1 (amps, C1N1/C1N1)
4972 24 CIRCUIT BKR 6 (amps, A1N1/A1N1)
4973 25 CIRCUIT BKR 6 (amps, B1N1/B1N1)
4974 26 CIRCUIT BKR 6 (amps, C1N1/C1N1)
4975 27 CIRCUIT BKR 7 (amps, A1N1/A1N1)
4976 28 CIRCUIT BKR 7 (amps, B1N1/B1N1)
4977 29 CIRCUIT BKR 7 (amps, C1N1/C1N1)
4978 30 CIRCUIT BKR 14 (amps, A1N1/A1N1)
4979 31 CIRCUIT BKR 14 (amps, B1N1/B1N1)
4980 32 CIRCUIT BKR 14 (amps, C1N1/C1N1)
4981 33 CIRCUIT BKR 16 (amps, A1N1/A1N1)
4982 34 CIRCUIT BKR 16 (amps, B1N1/B1N1)
4983 35 CIRCUIT BKR 16 (amps, C1N1/C1N1)

5.14. Parameter set for the Logger #948 - 10149 - Central Elect Power Plant (Main Substation #3)

***** Configuration for Logger: 10149 Parameter Set Code: a *****

----- INTEGRATION PERIODS -----

	AM		PM																					
From:	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
To:	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Flag:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mins:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

----- WATT CHANNELS -----

Chan	Description	STA	Load	Hi	Lo	VMult	Amps	Vlt	Amp	PR	KW	KVA	KWH	KVAH
CT 0	CIRCUIT BKR 13	ON	3P	C1	N1	1.00	600	*	*	0	*			
CT 1	CIRCUIT BKR 1	ON	3P	A1	N1	1.00	600	*	*	1	*			
CT 2	CIRCUIT BKR 1	ON	3P	B1	N1	1.00	600	*	*	2	*			
CT 3	CIRCUIT BKR 1	ON	3P	C1	N1	1.00	600	*	*	3	*			
CT 4	CIRCUIT BKR 6	ON	3P	A1	N1	1.00	600	*	*	4	*			
CT 5	CIRCUIT BKR 6	ON	3P	B1	N1	1.00	600	*	*	5	*			
CT 6	CIRCUIT BKR 6	ON	3P	C1	N1	1.00	600	*	*	6	*			
CT 7	CIRCUIT BKR 7	ON	3P	A1	N1	1.00	600	*	*	7	*			
CT 8	CIRCUIT BKR 7	ON	3P	B1	N1	1.00	600	*	*	8	*			
CT 9	CIRCUIT BKR 7	ON	3P	C1	N1	1.00	600	*	*	9	*			
CT10	CIRCUIT BKR 14	ON	3P	A1	N1	1.00	600	*	*	10	*			
CT11	CIRCUIT BKR 14	ON	3P	B1	N1	1.00	600	*	*	11	*			
CT12	CIRCUIT BKR 14	ON	3P	C1	N1	1.00	600	*	*	12	*			
CT13	CIRCUIT BKR 16	ON	3P	A1	N1	1.00	600	*	*	13	*			
CT14	CIRCUIT BKR 16	ON	3P	B1	N1	1.00	600	*	*	14	*			
CT15	CIRCUIT BKR 16	ON	3P	C1	N1	1.00	600	*	*	15	*			

Chan	Search String	Field Notes
CT 0		
CT 1		
CT 2		
CT 3		
CT 4		
CT 5		
CT 6		
CT 7		
CT 8		
CT 9		FORT HOOD MAIN SUBSTATION BLDG 100
CT10		SITE # 953 SERIAL # 10149
CT11		PHONE # 254-288-6122
CT12		LOGGER 3 OF 3

CT13
 CT14
 CT15

***** Configuration for Logger: 10149 Parameter Set Code: a *****

----- ANALOG CHANNELS -----

Chan	Description	Search String	STA	Scale	Offset	Units	T S G
A 0		OFF	1.00	0.00			
A 1		OFF	1.00	0.00			
A 2		OFF	1.00	0.00			
A 3		OFF	1.00	0.00			
A 4		OFF	1.00	0.00			
A 5		OFF	1.00	0.00			
A 6		OFF	1.00	0.00			
A 7		OFF	1.00	0.00			
A 8		OFF	1.00	0.00			
A 9		OFF	1.00	0.00			
A 10		OFF	1.00	0.00			
A 11		OFF	1.00	0.00			
A 12		OFF	1.00	0.00			
A 13		OFF	1.00	0.00			
A 14		OFF	1.00	0.00			
A 15	NOT USED!	OFF	-999.00	-999.00			

Chan	CType	Field Notes
A 0	OFF	
A 1	OFF	
A 2	OFF	
A 3	OFF	
A 4	OFF	
A 5	OFF	
A 6	OFF	
A 7	OFF	
A 8	OFF	
A 9	OFF	
A 10	OFF	
A 11	OFF	
A 12	OFF	
A 13	OFF	
A 14	OFF	
A 15	OFF	

***** Configuration for Logger: 10149 Parameter Set Code: a *****

----- DIGITAL CHANNELS -----

Chan	Description	Search String	STA	Scale	Units	TSR	AVG	RTS
------	-------------	---------------	-----	-------	-------	-----	-----	-----

D 0	OFF	1.00
D 1	OFF	1.00
D 2	OFF	1.00
D 3	OFF	1.00
D 4	OFF	1.00
D 5	OFF	1.00
D 6	OFF	1.00
D 7	OFF	1.00
D 8	OFF	1.00
D 9	OFF	1.00
D 10	OFF	1.00
D 11	OFF	1.00
D 12	OFF	1.00
D 13	OFF	1.00
D 14	OFF	1.00
D 15	OFF	1.00

Chan Field Notes

- D 0
- D 1
- D 2
- D 3
- D 4
- D 5
- D 6
- D 7
- D 8
- D 9
- D 10
- D 11
- D 12
- D 13
- D 14
- D 15

Description Variable Measurement #

CIRCUIT BKR 13	KW 0	0
CIRCUIT BKR 1	KW 1	0
CIRCUIT BKR 1	KW 2	0
CIRCUIT BKR 1	KW 3	0
CIRCUIT BKR 6	KW 4	0
CIRCUIT BKR 6	KW 5	0
CIRCUIT BKR 6	KW 6	0
CIRCUIT BKR 7	KW 7	0
CIRCUIT BKR 7	KW 8	0
CIRCUIT BKR 7	KW 9	0
CIRCUIT BKR 14	KW 10	0
CIRCUIT BKR 14	KW 11	0
CIRCUIT BKR 14	KW 12	0
CIRCUIT BKR 16	KW 13	0

CIRCUIT BKR 16	KW 14	0
CIRCUIT BKR 16	KW 15	0
CIRCUIT BKR 13	VOLT 0	0
CIRCUIT BKR 1	VOLT 1	0
CIRCUIT BKR 1	VOLT 2	0
CIRCUIT BKR 13	AMP 0	0
CIRCUIT BKR 1	AMP 1	0
CIRCUIT BKR 1	AMP 2	0
CIRCUIT BKR 1	AMP 3	0
CIRCUIT BKR 6	AMP 4	0
CIRCUIT BKR 6	AMP 5	0
CIRCUIT BKR 6	AMP 6	0
CIRCUIT BKR 7	AMP 7	0
CIRCUIT BKR 7	AMP 8	0
CIRCUIT BKR 7	AMP 9	0
CIRCUIT BKR 14	AMP 10	0
CIRCUIT BKR 14	AMP 11	0
CIRCUIT BKR 14	AMP 12	0
CIRCUIT BKR 16	AMP 13	0
CIRCUIT BKR 16	AMP 14	0
CIRCUIT BKR 16	AMP 15	0

5.15. Channel Identification Tables Istaraxp% listchid #949 - 10150 - Ft Hood West Substation

Chid	cp	Description
3305	-1	CLR CRK SW4 C PH (kva, C1N1/C1N1)
3306	-1	CLR CRK SW5 A PH (kva, A1N1/A1N1)
3307	-1	CLR CRK SW5 B PH (kva, B1N1/B1N1)
3308	-1	CLR CRK SW5 C PH (kva, C1N1/C1N1)
3309	-1	CLR CRK SW6 A PH (kva, A1N1/A1N1)
3310	-1	CLR CRK SW6 B PH (kva, B1N1/B1N1)
3311	-1	CLR CRK SW6 C PH (kva, C1N1/C1N1)
3315	-1	TEMP
3303	-1	CLR CRK SW4 A PH (kva, A1N1/A1N1)
3316	-1	SOLAR
3304	-1	CLR CRK SW4 B PH (kva, B1N1/B1N1)
3317	-1	HUMIDITY
3294	1	CLR CRK SW4 A PH (power, A1N1/A1N1)
3295	2	CLR CRK SW4 B PH (power, B1N1/B1N1)
3296	3	CLR CRK SW4 C PH (power, C1N1/C1N1)
3297	4	CLR CRK SW5 A PH (power, A1N1/A1N1)
3298	5	CLR CRK SW5 B PH (power, B1N1/B1N1)
3299	6	CLR CRK SW5 C PH (power, C1N1/C1N1)
3300	7	CLR CRK SW6 A PH (power, A1N1/A1N1)
3301	8	CLR CRK SW6 B PH (power, B1N1/B1N1)
3302	9	CLR CRK SW6 C PH (power, C1N1/C1N1)
4984	10	CLR CRK SW7 A PH (power, A1N1/A1N1)
4985	11	CLR CRK SW7 B PH (power, B1N1/B1N1)
4986	12	CLR CRK SW7 C PH (power, C1N1/C1N1)
4987	13	CLR CRK SW8 A PH (power, A1N1/A1N1)
4988	14	CLR CRK SW8 B PH (power, B1N1/B1N1)
4989	15	CLR CRK SW8 C PH (power, C1N1/C1N1)
3312	16	CLR CRK SW4 A PH (volts, A1N1/A1N1)
3313	17	CLR CRK SW4 B PH (volts, B1N1/B1N1)
3314	18	CLR CRK SW4 C PH (volts, C1N1/C1N1)
4990	19	CLR CRK SW4 A PH (amps, A1N1/A1N1)
4991	20	CLR CRK SW4 B PH (amps, B1N1/B1N1)
4992	21	CLR CRK SW4 C PH (amps, C1N1/C1N1)
4993	22	CLR CRK SW5 A PH (amps, A1N1/A1N1)
4994	23	CLR CRK SW5 B PH (amps, B1N1/B1N1)
4995	24	CLR CRK SW5 C PH (amps, C1N1/C1N1)
4996	25	CLR CRK SW6 A PH (amps, A1N1/A1N1)
4997	26	CLR CRK SW6 B PH (amps, B1N1/B1N1)
4998	27	CLR CRK SW6 C PH (amps, C1N1/C1N1)
4999	28	CLR CRK SW7 A PH (amps, A1N1/A1N1)
5000	29	CLR CRK SW7 B PH (amps, B1N1/B1N1)
5001	30	CLR CRK SW7 C PH (amps, C1N1/C1N1)
5002	31	CLR CRK SW8 A PH (amps, A1N1/A1N1)
5003	32	CLR CRK SW8 B PH (amps, B1N1/B1N1)
5004	33	CLR CRK SW8 C PH (amps, C1N1/C1N1)
5015	34	OUTSIDE AIR TEMP
5016	35	SOLAR
5017	36	OUTSIDE HUMIDITY

CT12
 CT13 FORT HOOD ARMY BASE
 CT14 LOGGER SITE # 954 SERIAL # 10150
 CT15 PHONE # 254-288-1111 LOGGER 2 OF 2

***** Configuration for Logger: 10150 Parameter Set Code: a *****

----- ANALOG CHANNELS -----

Chan	Description	Search String	STA	Scale	Offset	Units	T S G
A 0	OUTSIDE AIR TEMP		ON	55.50	-47.98	DEG F	*
A 1	SOLAR	ON	393.17	-326.09	WATTS/M		*
A 2	OUTSIDE HUMIDITY		ON	31.25	-25.00	% RH	*
A 3		OFF	1.00	0.00			
A 4		OFF	1.00	0.00			
A 5		OFF	1.00	0.00			
A 6		OFF	1.00	0.00			
A 7		OFF	1.00	0.00			
A 8		OFF	1.00	0.00			
A 9		OFF	1.00	0.00			
A 10		OFF	1.00	0.00			
A 11		OFF	1.00	0.00			
A 12		OFF	1.00	0.00			
A 13		OFF	1.00	0.00			
A 14		OFF	1.00	0.00			
A 15	NOT USED!		OFF	-999.00	-999.00		

Chan	CType	Field Notes
A 0	4-20ma	OUTSIDE AIR TEMPERATURE
A 1	4-20ma	PYR SN 4787 LICOR SENSOR (WATTS/METER SQUARED)
A 2	4-20ma	OUTSIDE AIR HUMIDITY
A 3	OFF	
A 4	OFF	
A 5	OFF	
A 6	OFF	
A 7	OFF	
A 8	OFF	
A 9	OFF	
A 10	OFF	
A 11	OFF	
A 12	OFF	
A 13	OFF	
A 14	OFF	
A 15	OFF	

***** Configuration for Logger: 10150 Parameter Set Code: a *****

----- DIGITAL CHANNELS -----

Chan	Description	Search String	STA	Scale	Units	TSR AVG RTS
D 0		OFF		1.00		
D 1		OFF		1.00		
D 2		OFF		1.00		
D 3		OFF		1.00		
D 4		OFF		1.00		
D 5		OFF		1.00		
D 6		OFF		1.00		
D 7		OFF		1.00		
D 8		OFF		1.00		
D 9		OFF		1.00		
D 10		OFF		1.00		
D 11		OFF		1.00		
D 12		OFF		1.00		
D 13		OFF		1.00		
D 14		OFF		1.00		
D 15		OFF		1.00		

Chan	Field Notes
D 0	
D 1	
D 2	
D 3	
D 4	
D 5	
D 6	
D 7	
D 8	
D 9	
D 10	
D 11	
D 12	
D 13	
D 14	
D 15	

Description	Variable	Measurement #
CLR CRK SW4 A PH KW	0	0
CLR CRK SW4 B PH KW	1	0
CLR CRK SW4 C PH KW	2	0
CLR CRK SW5 A PH KW	3	0
CLR CRK SW5 B PH KW	4	0
CLR CRK SW5 C PH KW	5	0
CLR CRK SW6 A PH KW	6	0
CLR CRK SW6 B PH KW	7	0
CLR CRK SW6 C PH KW	8	0
CLR CRK SW7 A PH KW	9	0
CLR CRK SW7 B PH KW	10	0
CLR CRK SW7 C PH KW	11	0
CLR CRK SW8 A PH KW	12	0

CLR CRK SW8 B PH KW 13	0
CLR CRK SW8 C PH KW 14	0
CLR CRK SW4 A PH VOLT 0	0
CLR CRK SW4 B PH VOLT 1	0
CLR CRK SW4 C PH VOLT 2	0
CLR CRK SW4 A PH AMP 0	0
CLR CRK SW4 B PH AMP 1	0
CLR CRK SW4 C PH AMP 2	0
CLR CRK SW5 A PH AMP 3	0
CLR CRK SW5 B PH AMP 4	0
CLR CRK SW5 C PH AMP 5	0
CLR CRK SW6 A PH AMP 6	0
CLR CRK SW6 B PH AMP 7	0
CLR CRK SW6 C PH AMP 8	0
CLR CRK SW7 A PH AMP 9	0
CLR CRK SW7 B PH AMP 10	0
CLR CRK SW7 C PH AMP 11	0
CLR CRK SW8 A PH AMP 12	0
CLR CRK SW8 B PH AMP 13	0
CLR CRK SW8 C PH AMP 14	0
OUTSIDE AIR TEMP AN 0	0
SOLAR AN 1	0
OUTSIDE HUMIDITY AN 2	0

5.17. Channel Identification Tables Istaraxp% listchid#944 - 10076 Ft Hood - Clear Creek Substation

Chid	cp	Description
4808	-1	CLR CRK SW3 A PH (kva, A1N1/A1N1)
4802	-1	CLR CRK SW1 A PH (kva, A1N1/A1N1)
4803	-1	CLR CRK SW1 B PH (kva, B1N1/B1N1)
4804	-1	CLR CRK SW1 C PH (kva, C1N1/C1N1)
4807	-1	CLR CRK SW2 C PH (kva, C1N1/C1N1)
4805	-1	CLR CRK SW2 A PH (kva, A1N1/A1N1)
4810	-1	CLR CRK SW3 C PH (kva, C1N1/C1N1)
4806	-1	CLR CRK SW2 B PH (kva, B1N1/B1N1)
4809	-1	CLR CRK SW3 B PH (kva, B1N1/B1N1)
4793	1	CLR CRK SW1 A PH (power, A1N1/A1N1)
4794	2	CLR CRK SW1 B PH (power, B1N1/B1N1)
4795	3	CLR CRK SW1 C PH (power, C1N1/C1N1)
4796	4	CLR CRK SW2 A PH (power, A1N1/A1N1)
4797	5	CLR CRK SW2 B PH (power, B1N1/B1N1)
4798	6	CLR CRK SW2 C PH (power, C1N1/C1N1)
4799	7	CLR CRK SW3 A PH (power, A1N1/A1N1)
4800	8	CLR CRK SW3 B PH (power, B1N1/B1N1)
4801	9	CLR CRK SW3 C PH (power, C1N1/C1N1)
4811	10	CLR CRK SW1 A PH (volts, A1N1/A1N1)
4812	11	CLR CRK SW1 B PH (volts, B1N1/B1N1)
4813	12	CLR CRK SW1 C PH (volts, C1N1/C1N1)
5005	13	CLR CRK SW1 A PH (amps, A1N1/A1N1)
5006	14	CLR CRK SW1 B PH (amps, B1N1/B1N1)
5007	15	CLR CRK SW1 C PH (amps, C1N1/C1N1)
5008	16	CLR CRK SW2 A PH (amps, A1N1/A1N1)
5009	17	CLR CRK SW2 B PH (amps, B1N1/B1N1)
5010	18	CLR CRK SW2 C PH (amps, C1N1/C1N1)
5011	19	CLR CRK SW3 A PH (amps, A1N1/A1N1)
5012	20	CLR CRK SW3 B PH (amps, B1N1/B1N1)
5013	21	CLR CRK SW3 C PH (amps, C1N1/C1N1)

5.18. Parameter set for the Logger #944 - 10076 Ft Hood - Clear Creek Substation

***** Configuration for Logger: 10076 Parameter Set Code: a *****

----- INTEGRATION PERIODS -----

	AM		PM																					
From:	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
To:	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Flag:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mins:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

----- WATT CHANNELS -----

Chan	Description	STA	Load	Hi	Lo	VMult	Amps	Vlt	Amp	PR	KW	KVA	KWH	KVAH
CT 0	CLR CRK SW1 A PH ON	3P	A1	N1	60.00	600	*	* 0	*					
CT 1	CLR CRK SW1 B PH ON	3P	B1	N1	60.00	600	*	* 1	*					
CT 2	CLR CRK SW1 C PH ON	3P	C1	N1	60.00	600	*	* 2	*					
CT 3	CLR CRK SW2 A PH ON	3P	A1	N1	60.00	600		* 3	*					
CT 4	CLR CRK SW2 B PH ON	3P	B1	N1	60.00	600		* 4	*					
CT 5	CLR CRK SW2 C PH ON	3P	C1	N1	60.00	600		* 5	*					
CT 6	CLR CRK SW3 A PH ON	3P	A1	N1	60.00	600		* 6	*					
CT 7	CLR CRK SW3 B PH ON	3P	B1	N1	60.00	600		* 7	*					
CT 8	CLR CRK SW3 C PH ON	3P	C1	N1	60.00	600		* 8	*					
CT 9	OFF 3P A1 N1	1.00	100	9										
CT10	OFF 3P B1 N1	1.00	100	10										
CT11	OFF 3P C1 N1	1.00	100	11										
CT12	OFF 3P A1 N1	1.00	100	12										
CT13	OFF 3P B1 N1	1.00	100	13										
CT14	OFF 3P C1 N1	1.00	100	14										
CT15	OFF 3P A1 N1	1.00	100	15										

Chan	Search String	Field Notes
CT 0	SWITCH 1 FEEDS:	GRAY ARMY AIR BASE, RADAR HILL, AND
CT 1	HANGER EAST	
CT 2		
CT 3	SWITCH 2 FEEDS:	91000, 92000, 90049, 90050, 90047 BLDGS
CT 4		
CT 5		
CT 6	SWITCH 3 FEEDS:	COMMANCHE II
CT 7		
CT 8	600:5 AMP CT'S /	7200:120 VOLT PT
CT 9		
CT10		
CT11		
CT12	FORT HOOD ARMY BASE,	KILLEEN, TEXAS

CT13 WEST BASE ELECTRICAL SUBSTATION
 CT14 SITE # 944 SERIAL # 10076
 CT15 PHONE # 254-288-1111 LOGGER 1 OF 2

***** Configuration for Logger: 10076 Parameter Set Code: a *****

----- ANALOG CHANNELS -----

Chan	Description	Search String	STA	Scale	Offset	Units	T S G
A 0		OFF	1.00	0.00			
A 1		OFF	1.00	0.00			
A 2		OFF	1.00	0.00			
A 3		OFF	1.00	0.00			
A 4		OFF	1.00	0.00			
A 5		OFF	1.00	0.00			
A 6		OFF	1.00	0.00			
A 7		OFF	1.00	0.00			
A 8		OFF	1.00	0.00			
A 9		OFF	1.00	0.00			
A 10		OFF	1.00	0.00			
A 11		OFF	1.00	0.00			
A 12		OFF	1.00	0.00			
A 13		OFF	1.00	0.00			
A 14		OFF	1.00	0.00			
A 15	NOT USED!	OFF	-999.00	-999.00			

Chan	CType	Field Notes
A 0	OFF	
A 1	OFF	
A 2	OFF	
A 3	OFF	
A 4	OFF	
A 5	OFF	
A 6	OFF	
A 7	OFF	
A 8	OFF	
A 9	OFF	
A 10	OFF	
A 11	OFF	
A 12	OFF	
A 13	OFF	
A 14	OFF	
A 15	OFF	

***** Configuration for Logger: 10076 Parameter Set Code: a *****

----- DIGITAL CHANNELS -----

Chan	Description	Search String	STA	Scale	Units	TSR	AVG	RTS
------	-------------	---------------	-----	-------	-------	-----	-----	-----

D 0	OFF	1.00
D 1	OFF	1.00
D 2	OFF	1.00
D 3	OFF	1.00
D 4	OFF	1.00
D 5	OFF	1.00
D 6	OFF	1.00
D 7	OFF	1.00
D 8	OFF	1.00
D 9	OFF	1.00
D 10	OFF	1.00
D 11	OFF	1.00
D 12	OFF	1.00
D 13	OFF	1.00
D 14	OFF	1.00
D 15	OFF	1.00

Chan Field Notes

- D 0
- D 1
- D 2
- D 3
- D 4
- D 5
- D 6
- D 7
- D 8
- D 9
- D 10
- D 11
- D 12
- D 13
- D 14
- D 15

Description Variable Measurement #

CLR CRK SW1 A PH KW 0	0
CLR CRK SW1 B PH KW 1	0
CLR CRK SW1 C PH KW 2	0
CLR CRK SW2 A PH KW 3	0
CLR CRK SW2 B PH KW 4	0
CLR CRK SW2 C PH KW 5	0
CLR CRK SW3 A PH KW 6	0
CLR CRK SW3 B PH KW 7	0
CLR CRK SW3 C PH KW 8	0
CLR CRK SW1 A PH VOLT 0	0
CLR CRK SW1 B PH VOLT 1	0
CLR CRK SW1 C PH VOLT 2	0
CLR CRK SW1 A PH AMP 0	0
CLR CRK SW1 B PH AMP 1	0

CLR CRK SW1 C PH AMP 2	0
CLR CRK SW2 A PH AMP 3	0
CLR CRK SW2 B PH AMP 4	0
CLR CRK SW2 C PH AMP 5	0
CLR CRK SW3 A PH AMP 6	0
CLR CRK SW3 B PH AMP 7	0
CLR CRK SW3 C PH AMP 8	0

5.19. Channel Identification Tables Istaraxp% listchid#937 - 10146 North Electrical Substation

Chid	cp	Description
5018	1	FEEDER 1 A PHASE (power, A1N1/A1N1)
5019	2	FEEDER 1 B PHASE (power, B1N1/B1N1)
5020	3	FEEDER 1 C PHASE (power, C1N1/C1N1)
5021	4	FEEDER 2 A PHASE (power, A1N1/A1N1)
5022	5	FEEDER 2 B PHASE (power, B1N1/B1N1)
5023	6	FEEDER 2 C PHASE (power, C1N1/C1N1)
5024	7	FEEDER 3 A PHASE (power, A1N1/A1N1)
5025	8	FEEDER 3 B PHASE (power, B1N1/B1N1)
5026	9	FEEDER 3 C PHASE (power, C1N1/C1N1)
5027	10	FEEDER 1 A PHASE (volts, A1N1/A1N1)
5028	11	FEEDER 1 B PHASE (volts, B1N1/B1N1)
5029	12	FEEDER 1 C PHASE (volts, C1N1/C1N1)
5030	13	FEEDER 1 A PHASE (amps, A1N1/A1N1)
5031	14	FEEDER 1 B PHASE (amps, B1N1/B1N1)
5032	15	FEEDER 1 C PHASE (amps, C1N1/C1N1)
5033	16	FEEDER 2 A PHASE (amps, A1N1/A1N1)
5034	17	FEEDER 2 B PHASE (amps, B1N1/B1N1)
5035	18	FEEDER 2 C PHASE (amps, C1N1/C1N1)
5036	19	FEEDER 3 A PHASE (amps, A1N1/A1N1)
5037	20	FEEDER 3 B PHASE (amps, B1N1/B1N1)
5038	21	FEEDER 3 C PHASE (amps, C1N1/C1N1)

5.20. Parameter set for the Logger #937 - 10146 North Electrical Substation

***** Configuration for Logger: 10146 Parameter Set Code: a *****

----- INTEGRATION PERIODS -----

	AM		PM																					
From:	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
To:	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Flag:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mins:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

----- WATT CHANNELS -----

Chan	Description	STA	Load	Hi	Lo	VMult	Amps	Vlt	Amp	PR	KW	KVA	KWH	KVAH
CT 0	FEEDER 1 A PHASE ON	3P	A1	N1	60.00	200	*	*	0	*				
CT 1	FEEDER 1 B PHASE ON	3P	B1	N1	60.00	200	*	*	1	*				
CT 2	FEEDER 1 C PHASE ON	3P	C1	N1	60.00	200	*	*	2	*				
CT 3	FEEDER 2 A PHASE ON	3P	A1	N1	60.00	200		*	3	*				
CT 4	FEEDER 2 B PHASE ON	3P	B1	N1	60.00	200		*	4	*				
CT 5	FEEDER 2 C PHASE ON	3P	C1	N1	60.00	200		*	5	*				
CT 6	FEEDER 3 A PHASE ON	3P	A1	N1	60.00	200		*	6	*				
CT 7	FEEDER 3 B PHASE ON	3P	B1	N1	60.00	200		*	7	*				
CT 8	FEEDER 3 C PHASE ON	3P	C1	N1	60.00	200		*	8	*				
CT 9	OFF	3P	A1	N1	1.00	100			9					
CT10	OFF	3P	B1	N1	1.00	100			10					
CT11	OFF	3P	C1	N1	1.00	100			11					
CT12	OFF	3P	A1	N1	1.00	100			12					
CT13	OFF	3P	B1	N1	1.00	100			13					
CT14	OFF	3P	C1	N1	1.00	100			14					
CT15	OFF	3P	A1	N1	1.00	100			15					

Chan	Search String	Field Notes
CT 0		
CT 1		
CT 2		
CT 3		
CT 4		
CT 5		
CT 6		
CT 7		
CT 8		
CT 9		
CT10	FORT HOOD ARMY BASE	
CT11	NORTH FORT ELECTRICAL SUBSTATION	

CT12 LOGGER SN 10146, SITE # 950
 CT13
 CT14
 CT15

***** Configuration for Logger: 10146 Parameter Set Code: a *****

----- ANALOG CHANNELS -----

Chan	Description	Search String	STA	Scale	Offset	Units	T S G
A 0		OFF	1.00	0.00			
A 1		OFF	1.00	0.00			
A 2		OFF	1.00	0.00			
A 3		OFF	1.00	0.00			
A 4		OFF	1.00	0.00			
A 5		OFF	1.00	0.00			
A 6		OFF	1.00	0.00			
A 7		OFF	1.00	0.00			
A 8		OFF	1.00	0.00			
A 9		OFF	1.00	0.00			
A 10		OFF	1.00	0.00			
A 11		OFF	1.00	0.00			
A 12		OFF	1.00	0.00			
A 13		OFF	1.00	0.00			
A 14		OFF	1.00	0.00			
A 15	NOT USED!		OFF	-999.00	-999.00		

Chan	CType	Field Notes
A 0	OFF	
A 1	OFF	
A 2	OFF	
A 3	OFF	
A 4	OFF	
A 5	OFF	
A 6	OFF	
A 7	OFF	
A 8	OFF	
A 9	OFF	
A 10	OFF	
A 11	OFF	
A 12	OFF	
A 13	OFF	
A 14	OFF	
A 15	OFF	

***** Configuration for Logger: 10146 Parameter Set Code: a *****

----- DIGITAL CHANNELS -----

Chan	Description	Search String	STA	Scale	Units	TSR	AVG	RTS
-----	-----	-----	-----	-----	-----	-----	-----	-----

D 0	OFF	1.00
D 1	OFF	1.00
D 2	OFF	1.00
D 3	OFF	1.00
D 4	OFF	1.00
D 5	OFF	1.00
D 6	OFF	1.00
D 7	OFF	1.00
D 8	OFF	1.00
D 9	OFF	1.00
D 10	OFF	1.00
D 11	OFF	1.00
D 12	OFF	1.00
D 13	OFF	1.00
D 14	OFF	1.00
D 15	OFF	1.00

Chan	Field Notes

D 0	
D 1	
D 2	
D 3	
D 4	
D 5	
D 6	
D 7	
D 8	
D 9	
D 10	
D 11	
D 12	
D 13	
D 14	
D 15	

Description	Variable	Measurement #

FEEDER 1 A PHASE	KW 0	0
FEEDER 1 B PHASE	KW 1	0
FEEDER 1 C PHASE	KW 2	0
FEEDER 2 A PHASE	KW 3	0
FEEDER 2 B PHASE	KW 4	0
FEEDER 2 C PHASE	KW 5	0
FEEDER 3 A PHASE	KW 6	0
FEEDER 3 B PHASE	KW 7	0
FEEDER 3 C PHASE	KW 8	0
FEEDER 1 A PHASE	VOLT 0	0
FEEDER 1 B PHASE	VOLT 1	0
FEEDER 1 C PHASE	VOLT 2	0
FEEDER 1 A PHASE	AMP 0	0
FEEDER 1 B PHASE	AMP 1	0
FEEDER 1 C PHASE	AMP 2	0

FEEDER 2 A PHASE AMP 3	0
FEEDER 2 B PHASE AMP 4	0
FEEDER 2 C PHASE AMP 5	0
FEEDER 3 A PHASE AMP 6	0
FEEDER 3 B PHASE AMP 7	0
FEEDER 3 C PHASE AMP 8	0

6. APPENDIX II LIST OF DATA FILES

In Figure 6-1 and Table 6-1 the organization and explanation of the data files is shown for the CDROM that accompanies this report. This CD contains all data collected to date from Ft. Hood by the ESL. In general these files are organized by logger number, with the exception of the whole-base natural gas use, which did not have numbered loggers associated with it.

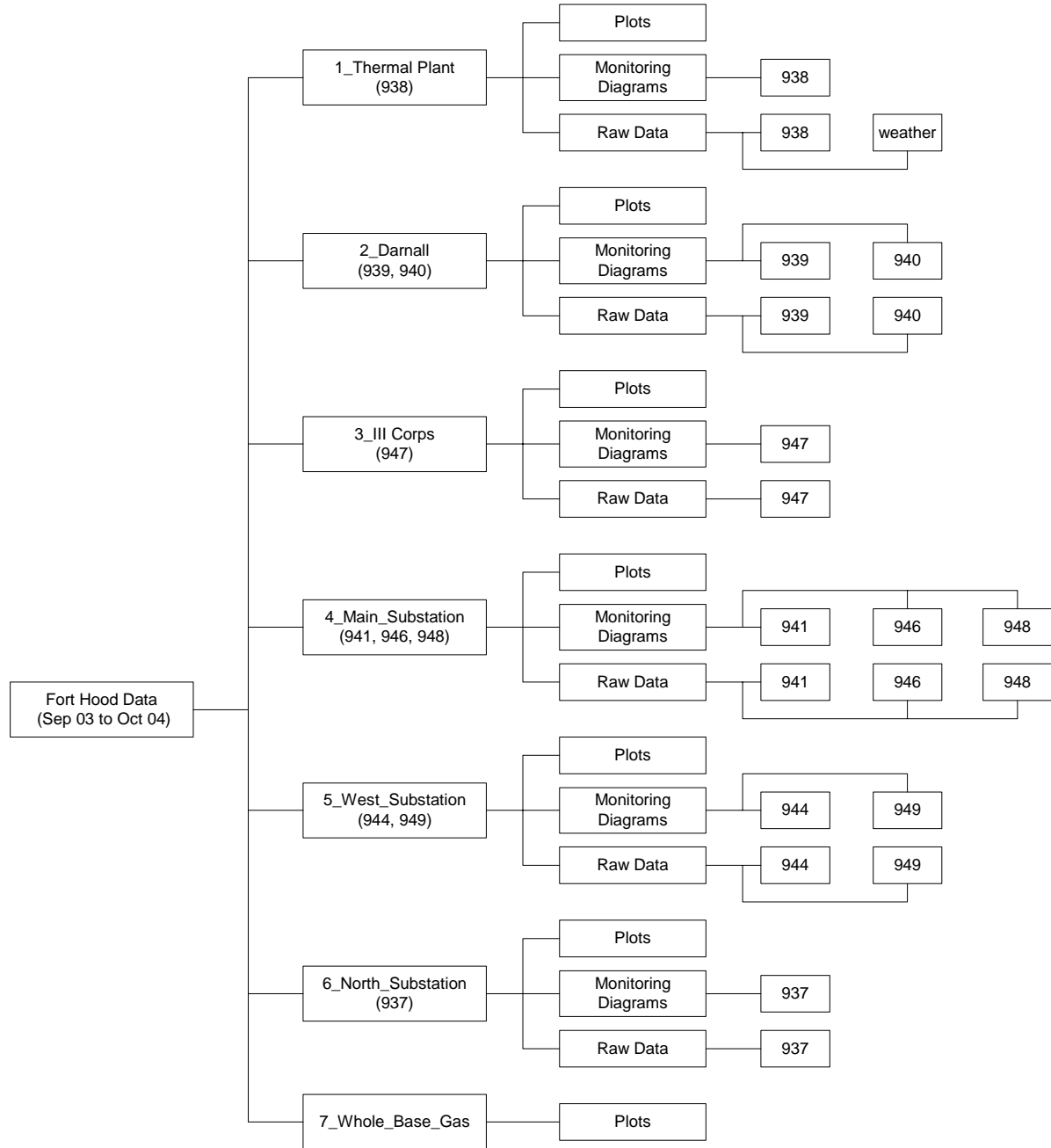


Figure 6-1 Organization of Files on the Accompanying CDROM.

Table 6-1 The description of Data Files in the Accompanying CDROM

Main Folder Name	Sub-Folder Name	Sub-Folder Name	Sub-Folder Name	File Name	Description	
Fort Hood Data (Sep 03 to Oct 04)	1_Thermal_Plant (938)	Plots		Thermal_Plant_(938)_(Sep 03-Oct 04)	Electricity and thermal data analysis and plots for thermal plant	
				938_3279_diagram	Monitoring diagram -938	
				938_parmset	Parameter set -938	
		Monitoring Diagrams	938	list938	Channel ID and description -938	
				FTHOOD_938_2003	2003 raw data -938	
				FTHOOD_938_2004	2004 raw data -938	
				WEA_SITE_2003	2003 Fort Hood weather data	
		Raw Data	938	WEA_SITE_2004	2004 Fort Hood weather data	
				Darnall_Hospital_(940,939)_(Sep 03-Oct 04)	Electricity and thermal energy analysis and plots for Darnall	
				939_3832_diagram	Monitoring diagram -939	
	2_Darnall_Hospital (939,940)	Monitoring Diagrams	939	939_parmset	Parameter set -939	
				list939	Channel ID and description -939	
				940_3831_diagram	Monitoring diagram -940	
				940_parmset	Parameter set -940	
		Raw Data	939	list940	Channel ID and description -940	
				FTHOOD_939_2003	2003 raw data -939	
				FTHOOD_939_2004	2004 raw data -939	
				FTHOOD_940_2003	2003 raw data -940	
				FTHOOD_940_2004	2004 raw data -940	
				III_Corps_(947)_(Sep 03-Oct 04)	Electricity and thermal energy analysis and plots for III Corps	
	3_III_Corps (947)	Monitoring Diagrams	947	947_10043_diagram	Monitoring diagram -947	
				947_parmset	Parameter set -947	
				list947	Channel ID and description -947	
		Raw Data	947	FTHOOD_947_2003	2003 raw data -947	
				FTHOOD_947_2004	2004 raw data -947	
				MainSub_(941,946,948)_(Sep 03-Oct 04)	Electricity data and plots for main substation	
	4_Main_Substation (941,946,948)	Monitoring Diagrams	941	941_10147_diagram	Monitoring diagram -941	
				941_parmset	Parameter set -941	
				list941	Channel ID and description -941	
			946	946_10148_diagram	Monitoring diagram -946	
				946_parmset	Parameter set -946	
				list946	Channel ID and description -946	
		Raw Data	941	948_10149_diagram	Monitoring diagram -948	
				948_parmset	Parameter set -948	
				list948	Channel ID and description -948	
				946	FTHOOD_941_2003	2003 raw data -941
					FTHOOD_941_2004	2004 raw data -941
					FTHOOD_946_2003	2003 raw data -946
		5_West_Substation (944,949)	Monitoring Diagrams	944	FTHOOD_946_2004	2004 raw data -946
					FTHOOD_948_2003	2003 raw data -948
					FTHOOD_948_2004	2004 raw data -948
				949	WestSub_(944,949)_(Sep 03-Oct 04)	Electricity data and plots for west substation
	944_10076_diagram				Monitoring diagram -944	
	944_parmset				Parameter set -944	
	Raw Data		944	list944	Channel ID and description -944	
				949_10150_diagram	Monitoring diagram -949	
				949_parmset	Parameter set -949	
				list949	Channel ID and description -949	
	6_North_Substation (937)	Monitoring Diagrams	937	FTHOOD_944_2003	2003 raw data -944	
				FTHOOD_944_2004	2004 raw data -944	
FTHOOD_949_2003				2003 raw data -949		
Raw Data		937	FTHOOD_949_2004	2004 raw data -949		
			NorthSub_(937)_(Sep 03-Oct 04)	Electricity data and plots for north substation		
			937_10146_diagram	Monitoring diagram -937		
7_Whole_base Gas	Plots		937_parmset	Parameter set -937		
			list937	Channel ID and description -937		
ReadMe.doc				FTHOOD_937_2003	2003 raw data -937	
				FTHOOD_937_2004	2004 raw data -937	
				Gas_1999-2004	The whole base gas usage from west, south and north meter	
					The files included in the accompanying CD.	
					Fort Hood baseline report -2004	