United States Steel Corporation
Great Lakes Works

40 CFR 63 Subpart FFFFF
National Emission Standards for Hazardous Air Pollutants
For Integrated Iron and Steel Manufacturing Facilities
▫ Operation and Maintenance Plan

Applicable to the following:

- **Processes:**
  - **Blast Furnace Casting**

- **Capture Systems:**
  - **B-2 Blast Furnace Casthouse Emissions Control System**
  - **D-4 Blast Furnace Casthouse Emissions Control System**

- **Control Equipment:**
  - **B-2 Blast Furnace Casthouse Baghouse**
  - **D-4 Blast Furnace Casthouse Baghouse**

- **Continuous Parametric Monitoring Systems:**
  - **Bag Leak Detection**
  - **Fan Amps**

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1.0 INTRODUCTION

1.1 Background

1.1.1 NESHAP - 40 CFR 63 Subpart FFFFF

National Emissions Standards for Hazardous Air Pollutants for Integrated Iron and Steel Manufacturing were promulgated under 40 CFR 63 Subpart FFFFF on May 20, 2003. The following USS-GLW facilities are subject to the standards specified under 40 CFR 63 Subpart FFFFF:

- blast furnaces
- basic oxygen process furnaces (BOPF)

The following USS-GLW facilities emission sources are subject to the standards specified under 40 CFR 63 Subpart FFFFF:

- Blast furnace casthouse
- Basic oxygen process furnace (BOPF)
- BOPF shop hot metal transfer
- BOPF shop hot metal desulfurization
- BOPF shop hot metal slag skimming
- BOPF shop ladle metallurgy

1.2 Purpose

1.2.1 NESHAP - 40 CFR 63 Subpart FFFFF

These standards require that certain plans be developed and implemented by May 22, 2006. The purpose of this document is to comply with the requirements of 40 CFR 63 Subparts A and FFFFF to develop and implement the following plans:

- Operation and maintenance plan
- Site-specific monitoring plan
- Startup, shutdown and malfunction plan

1.3 Applicability

1.3.1 NESHAP - 40 CFR 63 Subpart FFFFF

1.3.1(a) Operation and Maintenance Plan

40 CFR 63.7800 requires that a written Operation and Maintenance plan be developed and implemented for the following particulate emission capture systems* and particulate emission control devices specified in 40 CFR 63.7790(b):

- Blast furnace casthouse particulate emission capture systems
- BOPF secondary particulate emission capture systems
- BOPF electrostatic precipitator primary particulate emission control systems

* For purposes of this plan, "emission capture system" includes emission capture hoods, ductwork, dampers and fans important to the efficient collection and transport of particulate emissions to a particulate emission control device. The particulate emission control device is not part of the particulate emission capture system.

1.3.1(b) Site-Specific Monitoring Plan

The Site-Specific Monitoring Plans are not included in this document. They are included in a separate document.

1.3.1(c) Startup, Shutdown and Malfunction Plans

The Startup, Shutdown, and Malfunction Plans are not included in this document. They are included in a separate document.

2.0 OPERATION AND MAINTENANCE PLAN

2.1 SCOPE

The following particulate emission capture systems and particulate emission control devices are subject to the NESHAP 40 CFR 63 Subpart FFFFF requirement and are covered by this plan:

- Particulate emission ***capture*** systems
  - B-2 Blast Furnace Casthouse Emissions Control System
  - D-4 Blast Furnace Casthouse Emissions Control System

- Particulate emission ***control*** devices
  - B-2 Blast Furnace Casthouse Baghouse
  - D-4 Blast Furnace Casthouse Baghouse

2.1.1 The purpose of this plan is to ensure that the above are operated and maintained in a manner consistent with good air pollution control practices. (63.7800(a))

2.1.2 Definitions

2.1.2.1 Capture systems includes the hood, dampers, ductwork, and fans.

2.1.2.2 Control device consists of baghouse components (filter bags, cleaning mechanisms, hoppers, dust handling, etc.)

2.2 PLAN ELEMENTS

2.2.1 Capture System Inspections

2.2.1.1 For the B-2 and D-4 Blast Furnace Casthouse emissions control capture systems, the following program of capture system inspections will be implemented.

Equipment	Inspection Frequency	Inspection Responsibility	Recording Method	Regulatory Citation
Hoods	Monthly	Maintenance	CMMS	§63.7800(b)(1)
Ductwork (External)	Monthly	Maintenance	CMMS	§63.7800(b)(1)
Expansion Joints	Monthly	Maintenance	CMMS	§63.7800(b)(1)
Process Dampers	Monthly	Maintenance	CMMS	§63.7800(b)(1)
Fan Exterior	Monthly	Maintenance	CMMS	§63.7800(b)(1)
Fan Housing & Seals	Monthly	Maintenance	CMMS	§63.7800(b)(1)
Fan Bearings & Couplings	Monthly	Maintenance	CMMS	§63.7800(b)(1)
Fan Motor Bearings	Monthly	Maintenance	CMMS	§63.7800(b)(1)

2.2.1.2 For each site-specific capture system, an inspection program will be implemented based on the capture system components. The inspection program matrix is included in the Appendix section.

2.2.1.3 Any identified deficiencies (such as holes, corrosion, deformation, broken drive shafts), damaged areas, or other conditions affecting performance will be reported to the Environmental Department for capture system impact evaluation and to the Facility Area Maintenance Manager for correction prior to the next inspection.

2.2 PLAN ELEMENTS

2.2.2 Control Device Preventive Maintenance §63.7800(b)(2)

2.2.2.1 For the B-2 and D-4 Blast Furnace Casthouse emissions control devices, a program of specific system preventive maintenance will be implemented in accordance with accepted maintenance practices, equipment maintenance history and experience, or the manufacturer's recommendation.

2.2.2.2 For each site-specific control device, a preventive maintenance program will be implemented based on the system components. The preventive maintenance program matrix is included in the Appendix section.

2.2.2.3 USS-GLW uses a computer based preventive maintenance system to generate work orders for regularly scheduled inspection and maintenance activities. The initial inspection and repair schedules are based on the accepted maintenance practices or the equipment manufacturer's recommended frequency. Inspection results and repair activities are tracked by the system and schedule frequency is modified as deemed appropriate.

2.2 PLAN ELEMENTS

2.2.3 Capture System Operating Limits §63.7800(b)(3)

2.2.3.1 General §63.7800(b)(3)(i) & §63.7800(b)(3)(iii)

For the B-2 and D-4 Blast Furnace Casthouse emissions control capture systems, the following operating limits parameters have been identified as the representative indicators of the capture system performance.

2.2.3.1.1 Process Damper Position §63.7800(b)(3)(i) & (iii)

All process dampers are physically fixed in one position. No position monitoring is required.

2.2.3.1.2 Fan Motor Amperage §63.7800(b)(3)(i) & (iii)

For each capture system, each of the collection fan motor starters is equipped with current sensors and transmitters that continuously record fan motor amperages.

2.2.3.1.3 Operating Limits for the B-2 and D-4 Blast Furnaces Casthouse Baghouses (63.7800(b)(3))

Operating Limit Parameter	Why Chosen	Recording Method	Averaging Frequency	Regulatory Citation
Fan amps	Current equipment	Continuous	Operational Period average	63.7800(b)(3)

2.2.3.2 Description of capture system design will be maintained in the Environmental Department files. (63.7800(b)(3)(iii))

At each Blast Furnace (B-2 & D-4) Casthouse, the capture system consists of one (1) Tap hole / Iron trough emissions collection hood and one (1) Tilting Runner emissions collection hood connected by branch and main header ductwork to a negative pressure pulse jet type dust collector unit. For the D-4 Blast Furnace Casthouse emissions capture system, process damper at each of the hoods are physically fixed in position. For the B-2 Blast Furnace Casthouse emissions capture system, there are no process dampers

2.2 PLAN ELEMENTS

2.2.3.3 Description of the capture system operating during production will be maintained in the Environmental Department files. (63.7800(b)(3)(iii))

At each Blast Furnace (B-2 & D-4) Casthouse, the capture system will be in operation during all periods of hot metal casting.

2.2.3.4 Rationale for why the parameter was chosen will be maintained in the Environmental Department files. (63.7800(b)(3)(iii)).

See Appendix C for rationale.

2.2.3.5 Description of each selected operating limit parameter will be maintained in the Environmental Department files. (63.7800(b)(3)(iii))

See Appendix C for description.

2.2.3.6 Description of method used to monitor parameter will be maintained in the Environmental Department files. (63.7800(b)(3)(iii))

See Appendix C for description.

2.2.3.7 Data used to set the value or settings for the parameter for each process configuration will be maintained in the Environmental Department files. (63.7800(b)(3)(iii))

The fan amp lower limit for B2 blast furnace is: 159. The fan amp lower limit for D4 blast furnace is: 58.

These limits were determined by tracking for each hour the maximum fan amps recorded for each fan. Then taking the lowest of these amp values across all the operating baghouse fans. The result is that for each hour, the minimum amp value for all fans is known. The specific threshold is based on the lower 0.135 percentile of the observed data. This value corresponds to the one-tail three-sigma probability for a normal distribution. It was determined that the 0.135 percentile from the empirical cumulative distribution of the 2006 data. The use of a nonparametric approach is used to avoid reliance on any assumed distributional form, which inspection of the histograms indicates would be inappropriate. See Appendix C for the back up data used to establish the limits.

2.2 PLAN ELEMENTS

2.2.4 Bag Leak Detection §63.7800(b)(4)

2.2.4.1 General §63.7800(b)(4)
For each capture system with a negative pressure type dust collector, bag leak detection instrumentation is installed.

2.2.4.1.1 At D-4 Blast Furnace Casthouse Baghouse, a single stack-mounted bag leak detection system is installed. In the event of an alarm, the control system PLC tracks the dust collector cleaning cycle to aid in focusing the troubleshooting efforts to locate the source of the alarm. §63.7800(b)(3)(iii)

2.2.4.1.2 At B-2 Blast Furnace Casthouse Baghouse, the bag leak detection probes are mounted on the outlet stub duct from each individual module. In the event of an alarm, a signal from the specific module bag leak detector will be sent to the operating station pulpit. §63.7800(b)(3)(iii)

2.2.4.2 In the event that the particulate emissions discharge levels increase above the set point, a bag leak alarm is triggered and an alarm signal will be sent to the designated in service process facility area operating station pulpit.

Bag Leak Detector Alarm Response	Response Action	Corrective Action (CA) Responsibilities	Recording Method	Regulatory Citation
Within 1 hour	Initiate CA to determine the cause of the alarm	Maintenance	paper	63.7800(b)(4)
Within 24 hours	Initiate CA to correct the cause of the problem	Maintenance	paper	63.7800(b)(4)
As soon as practicable	Complete corrective action	Maintenance	paper	63.7800(b)(4)

The operator acknowledges that alarm either by pushbutton or HMI input, and contacts the following personnel per Procedure USSC-L-P-1510-01-05.

2.2 PLAN ELEMENTS

2.2.4 Bag Leak Detection §63.7800(b)(4)

2.2.4.4 Upon notification of a bag leak alarm, the Area Maintenance Manager or assigned designee will initiate one or more of the following actions:

2.2.4.4.1 Clean the probe and observe levels after cleaning to determine if a dirty probe was the cause of the alarm. Implement notification procedure USSC-L-P-1510-01-05, or §63.7800(b)(4)(v)

2.2.4.4.2 Determine if the probe is functioning properly, repair bag leak detection system, if necessary. Implement notification procedure USSC-L-P-1510-01-05, or §63.7800(b)(4)(v)

2.2.4.4.3 Shut the affected module down and implement notification procedure USSC-L-P-1510-01-05. §63.7800(b)(4)(ii) & (iv)

2.2.4.4.4 The Area Maintenance Manager or assigned designee will document the alarm cause, the corrective action, and schedule to correct alarm.

2.2.4.5 Within twenty-four (24) hours of receipt of a valid bag leak detection alarm, Area Maintenance Manager or assigned designee will inspect the baghouse for air leaks, torn or broken bags, or any other condition that may cause an increase in emissions. §63.7800(b)(4)(i)

2.2.4.5.1 Torn, broken, or leaking bags will be isolated and repaired or replaced. §63.7800(b)(4)(iii)

2.2.4.5.2 Corrective action to correct a bag leak detection issue will be initiated within 24 hours of the alarm and completed as soon as is practical.

2.2.4.5.3 In the event of a module isolation or complete baghouse shutdown, blast furnace operations will take the appropriate actions according to the applicable procedure for casting without the entire system. §63.7800(b)(4)(vi)

2.2 PLAN ELEMENTS

2.2.5 Dust Collector Inspections §63.7830(b)(1)-(8)

2.2.5.1 For each dust collector control device subject to the MACT regulation requirements, the following program of system performance monitoring and inspections will be implemented.

Dust Collector Equipment	Inspection Frequency	Inspection Task	Recording Method	Regulatory Citation
Monitor the pressure drop across each baghouse cell each day to ensure pressure drop is within the normal operating range identified in the manual.	Daily	Operations	Manual	§63.7830(b)(1)
Confirm that dust is being removed from hoppers through weekly visual inspections or other means of ensuring the proper functioning of removal mechanisms.	Weekly	Maintenance	CMMS	§63.7830(b)(2)
Check the compressed air supply for pulse-jet baghouses.	Daily	Operations	Manual	§63.7830(b)(3)
Monitor cleaning cycles to ensure proper operation using an appropriate methodology.	Daily	Maintenance	CMMS	§63.7830(b)(4)
Check bag cleaning mechanisms for proper functioning using an appropriate methodology.	Monthly	Maintenance	Paper	§63.7830(b)(5)
Confirm the physical integrity of the baghouse through visual inspections of the baghouse interior for air leaks.	Quarterly	Maintenance	CMMS	§63.7830(b)(7)
Inspect fans for wear, material buildup, and corrosion through quarterly visual inspections, vibration detectors or equivalent means.	Quarterly	Maintenance	CMMS	§63.7830(b)(8)

2.2.5.2 For each site-specific control device, an inspection program will be implemented based on the above requirements. The inspection program matrix is included in the Appendix section.

2.2.5.3 Any identified damaged areas will be reported to the Facility Area Maintenance Manager for incorporation into the maintenance repair schedule for completion prior to the next inspection.

3.0 PLAN MAINTENANCE, RECORDKEEPING AND REPORTING

3.1 INITIAL PLAN REQUIREMENTS

- The Operation and Maintenance Plan, Site-Specific Monitoring Plan and Startup, Shutdown and Malfunction Plan must be developed and implemented by May 22, 2006
- The plans are not required to be submitted to or approved by U.S. EPA or MDEQ unless required the Title V operating permit.
- Failure to meet any condition in a plan is a deviation and must be reported as such in the semi-annual and annual deviation report.

3.2 PLAN REVISIONS

- Plans may be revised at any time provided that notification is given to the permitting agency in the next periodic Title V compliance certification.

3.3 RECORDKEEPING

- All current plans and superceded plans must be maintained for the life of the affected source. All other information necessary to demonstrate compliance with each plan requirement must be kept on-site for a period of at least 5 years.

3.4 SPECIAL STARTUP, SHUTDOWN AND MALFUNCTION REPORTING REQUIREMENT

- If, at any time, the Startup, Shutdown and Malfunction Plan is not followed during a startup, shutdown or malfunction event, the failure must be reported by telephone, FAX or E-Mail within 2 days following the failure to the permitting agency.
- Within 7 days following the end of the startup, shutdown or malfunction event, a letter must be submitted including the following information:
  1. Name and title of Reporting Official
  2. Certifying signature of the plant Responsible Official
  3. How the startup, shutdown or malfunction event happened
  4. What the response to the event was
  5. Reasons the Startup, Shutdown and Malfunction Plan was not followed
  6. Whether any regulated HAP emissions or monitored parameters were higher or different from their allowable values during the startup, shutdown or malfunction event.
- Within 45 day of the end of the event, the Startup, Shutdown and Malfunction Plan must be revised to describe the additional or corrected response in the event that cause happens again.
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Appendix A - Capture System Inspections §63.7800(b)(1)
Reference: Blast Furnace O & M Plan Section 2.2.1

B-2 BF Casthouse Baghouse	Procedure (P) / Documentation (D)	Master Work Order #
Capture System Inspections		03044810 03044826
Exterior Hoods / Ductwork / Exp Joints	P	03745470
Exterior Process Dampers / Actuators	P	03745470
Exterior Fans / Bearings / Vibration	P	03745470 03745529
Exterior Baghouse Hoppers & Dust Handling Equipment	P	03745470
Exterior Cleaning System Components	P	03044810
Interior Baghouse Modules / Filterbags	P	03745545
Interior Fans / Rotor / Shaft	P	03745515

D-4 BF Casthouse Baghouse	Procedure (P) / Documentation (D)	Master Work Order #
Capture System Inspections		03080747 03041992 03041640
Exterior Hoods / Ductwork / Exp Joints	P	03157940
Exterior Process Dampers / Actuators	P	03157940
Exterior Fans / Bearings / Vibration	P	03745534
Exterior Baghouse Hoppers & Dust Handling Equipment	P	03157940
Exterior Cleaning System Components	P	03080747
Interior Baghouse Modules / Filterbags	P	03745562
Interior Fans / Rotor / Shaft	P	03043534, 35, & 36

Appendix B - Control Device Preventive Maintenance §63.7800(b)(2)
Reference: Blast Furnace O & M Plan Section 2.2.2

B-2 BF Casthouse Baghouse	Procedure (P) / Documentation (D)	Master Work Order #
Preventive Maintenance		
Baghouse Module Components	P	03344826 03745470
Pulse Jet Cleaning System Components	P	03041195 03742132 03745473
Dust Handling System Components	P	03044810 03745470
Fans	P	03045082 03040421 03043984 03043985 03043986

D-4 BF Casthouse Baghouse	Procedure (P) / Documentation (D)	Master Work Order #
Preventive Maintenance - General		03044635
Baghouse Module Components	P	03036634, 36, 37, 38, 39, 40, 41, 42, 43, 44
Pulse Jet Cleaning System Components	P	03041543 03745473
Dust Handling System Components	P	03044842
Fans	P	03044842

Appendix C - Operating Limit Parameter Documentation §63.7800(b)(3)(iii)
Reference: Blast Furnace O & M Plan Section 2.2.3

C-1 - Rationale for why the parameter was chosen will be maintained in the Environmental Department files. (63.7800(b)(3)(iii))
Reference: Blast Furnace O &M Plan Section 2.2.3.4

The fan motor amperage parameter was identified as the most consistent indicator of the capture system performance for the following reasons:

i) The fan motor amperage monitoring instrumentation is typically installed in weather protected locations or electrical boxes, requires no maintenance after initial installation and commissioning, and requires minimal re-calibration.

ii) The fan motor amperage parameter monitoring instrumentation will provide a consistent signal and operating range, except for seasonal fluctuations due to changes in the ambient temperature condition.

iii) The fan motor amperage operating range can be directly correlated to the fan operational performance based on the capture system fan curve and fan law relationships.

iv) Changes in fan performance operation due to significant capture system malfunctions (significant changes in pressure drop across the control device, fan inefficiency, capture system inefficiency) will quickly correlate to a change in the fan motor amperage parameter readings.

C-2 - Description of each selected operating limit parameter will be maintained in the Environmental Department files. (63.7800(b)(3)(iii))
Reference: Blast Furnace O &M Plan Section 2.2.3.5

B-2 Blast Furnace Casthouse Emissions System
The fan current sensor and transmitters are located in the fan motor starter MCC panels located in the B-2 Blast Furnace Casthouse Baghouse Control Room.

D-4 Blast Furnace Casthouse Emissions Control System
The fan current sensor and transmitters are located in the fan motor starter MCC panels located in the D-4 Blast Furnace Casthouse Baghouse Control Room.

C-3 - Description of method used to monitor parameter will be maintained in the Environmental Department files. (63.7800(b)(3)(iii))
Reference: Blast Furnace O &M Plan Section 2.2.3.6

For each capture system, each of the collection fan motor starters is equipped with current sensors and transmitters that continuously record fan motor amperages. The monitoring parameter data is collected and transferred to a Level II data server for recordkeeping.

Appendix C - Operating Limit Parameter Documentation §63.7800(b)(3)(iii)
Reference: Blast Furnace O & M Plan Section 2.2.3

C-4 - Data used to set the value or settings for the parameter for each process configuration will be maintained in the Environmental Department files. (63.7800(b)(3)(iii))
Reference: Blast Furnace O &M Plan Section 2.2.3.7

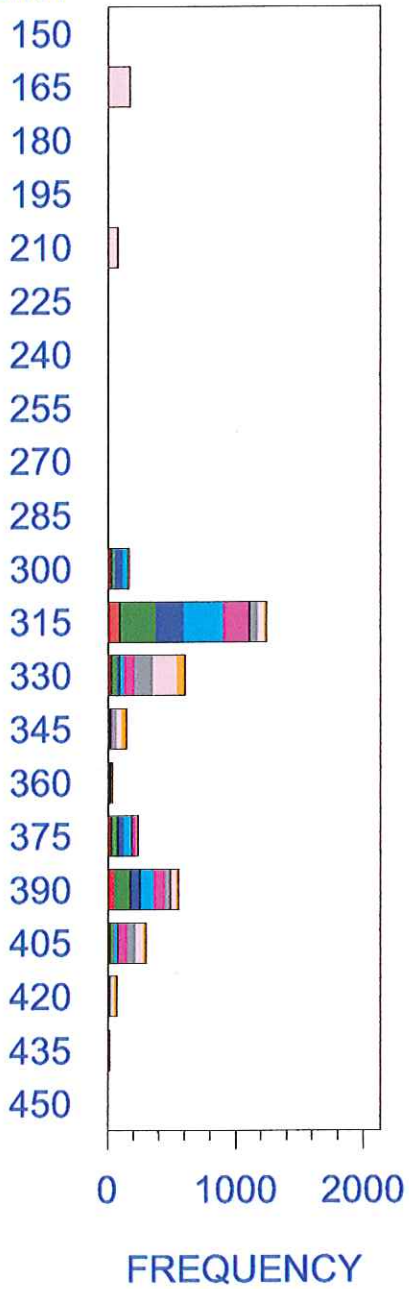
i) The site specific operating limit parameter ranges will be established by monitoring and recording the parameters during typical capture system operations and during performance of stack testing.

ii) Site-specific operating limit parameters ranges will be established based on all facility process operation modes and for changes in seasonal conditions.

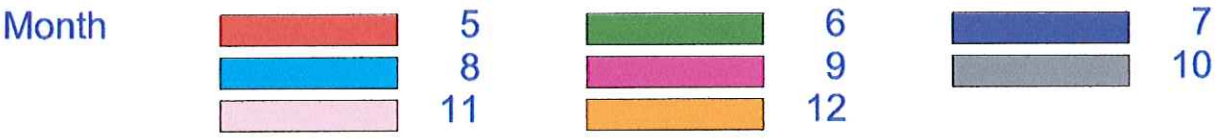
iii) For each emissions control capture system subject to the MACT regulation requirements (Blast Furnace Casthouse Emissions), the identified site-specific operating limit parameters and ranges matrix is included in the Appendix section.

Analysis of Zug Island Baghouse Fan Amps - B2

Based on 2006 Hourly Maximum Observed Fan Amps



B2_FA1 MIDPOINT	FREQ.	CUM. FREQ.	PCT.	CUM. PCT.
150	1	1	0.03	0.03
165	170	171	4.71	4.74
180	1	172	0.03	4.76
195	2	174	0.06	4.82
210	72	246	1.99	6.81
225	2	248	0.06	6.87
240	0	248	0.00	6.87
255	1	249	0.03	6.90
270	0	249	0.00	6.90
285	0	249	0.00	6.90
300	168	417	4.65	11.55
315	1240	1657	34.35	45.90
330	603	2260	16.70	62.60
345	143	2403	3.96	66.57
360	34	2437	0.94	67.51
375	236	2673	6.54	74.04
390	556	3229	15.40	89.45
405	297	3526	8.23	97.67
420	68	3594	1.88	99.56
435	15	3609	0.42	99.97
450	1	3610	0.03	100.00



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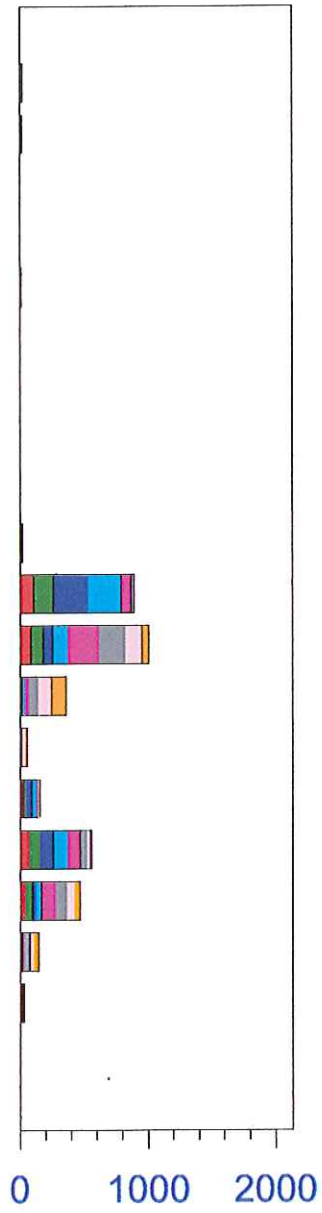
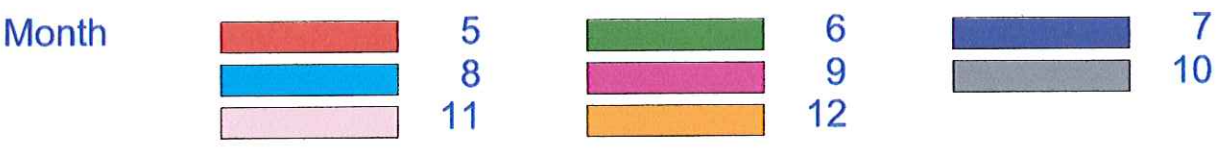
Analysis of Zug Island Baghouse Fan Amps - B2

Based on 2006 Hourly Maximum Observed Fan Amps



B2_FA2 MIDPOINT	FREQ.	CUM. FREQ.	PCT.	CUM. PCT.
143	1	1	0.03	0.03
158	19	20	0.51	0.53
173	17	37	0.45	0.99
188	1	38	0.03	1.01
203	2	40	0.05	1.07
218	9	49	0.24	1.31
233	1	50	0.03	1.33
248	2	52	0.05	1.39
263	0	52	0.00	1.39
278	0	52	0.00	1.39
293	23	75	0.61	2.00
308	895	970	23.87	25.87
323	1007	1977	26.86	52.73
338	357	2334	9.52	62.26
353	54	2388	1.44	63.70
368	155	2543	4.13	67.83
383	562	3105	14.99	82.82
398	469	3574	12.51	95.33
413	143	3717	3.81	99.15
428	28	3745	0.75	99.89
443	2	3747	0.05	99.95
458	2	3749	0.05	100.00



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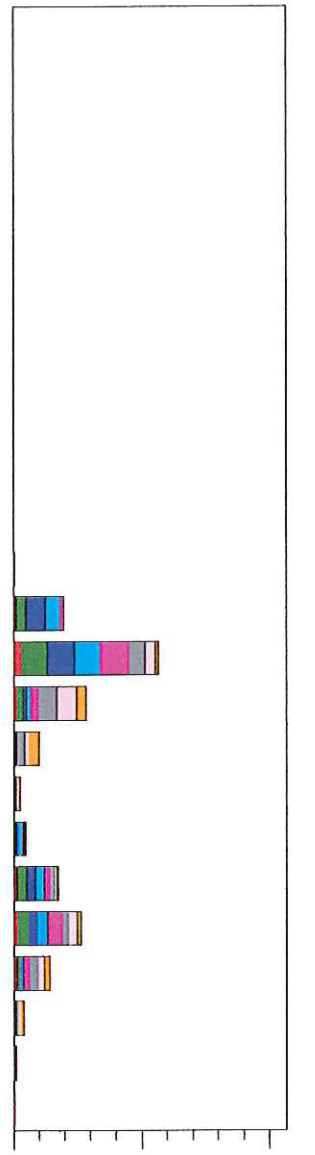
Analysis of Zug Island Baghouse Fan Amps - B2

Based on 2006 Hourly Maximum Observed Fan Amps

B2_FA3 MIDPOINT	FREQ.	CUM. FREQ.	PCT.	CUM. PCT.
156	1	1	0.03	0.03
168	0	1	0.00	0.03
180	0	1	0.00	0.03
192	1	2	0.03	0.05
204	0	2	0.00	0.05
216	0	2	0.00	0.05
228	0	2	0.00	0.05
240	0	2	0.00	0.05
252	0	2	0.00	0.05
264	2	4	0.05	0.11
276	0	4	0.00	0.11
288	0	4	0.00	0.11
300	6	10	0.16	0.27
312	394	404	10.60	10.87
324	1132	1536	30.46	41.33
336	568	2104	15.29	56.62
348	199	2303	5.36	61.98
360	50	2353	1.35	63.32
372	97	2450	2.61	65.93
384	348	2798	9.36	75.30
396	527	3325	14.18	89.48
408	282	3607	7.59	97.07
420	81	3688	2.18	99.25
432	22	3710	0.59	99.84
444	6	3716	0.16	100.00



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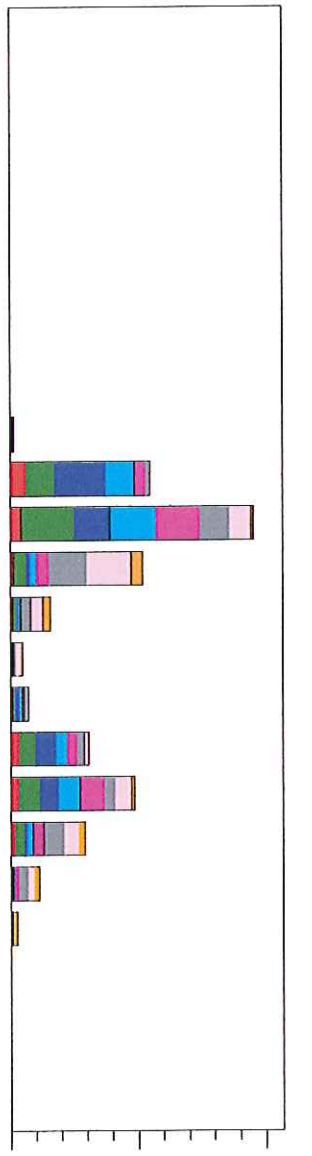
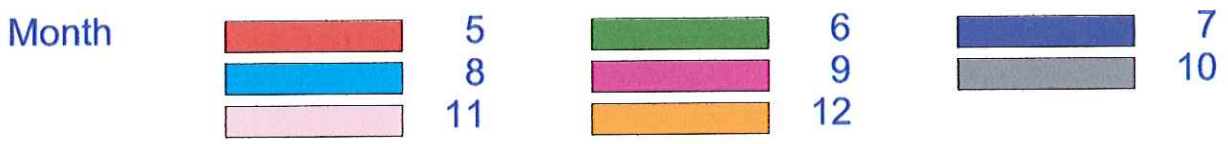
Analysis of Zug Island Baghouse Fan Amps - B2

Based on 2006 Hourly Maximum Observed Fan Amps



B2_FA4 MIDPOINT	FREQ.	CUM. FREQ.	PCT.	CUM. PCT.
180	1	1	0.03	0.03
192	0	1	0.00	0.03
204	0	1	0.00	0.03
216	0	1	0.00	0.03
228	0	1	0.00	0.03
240	0	1	0.00	0.03
252	2	3	0.06	0.08
264	0	3	0.00	0.08
276	0	3	0.00	0.08
288	16	19	0.45	0.54
300	551	570	15.57	16.11
312	954	1524	26.96	43.06
324	519	2043	14.67	57.73
336	158	2201	4.46	62.19
348	48	2249	1.36	63.55
360	68	2317	1.92	65.47
372	307	2624	8.67	74.15
384	486	3110	13.73	87.88
396	291	3401	8.22	96.10
408	111	3512	3.14	99.24
420	24	3536	0.68	99.92
432	1	3537	0.03	99.94
444	1	3538	0.03	99.97
456	0	3538	0.00	99.97
468	1	3539	0.03	100.00



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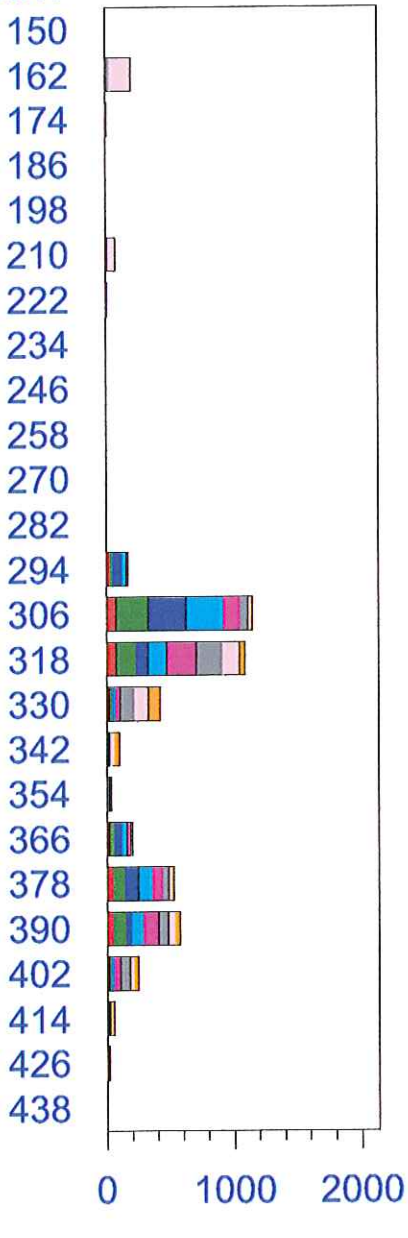
Analysis of Zug Island Baghouse Fan Amps - B2

Based on 2006 Hourly Maximum Observed Fan Amps



B2_MIN MIDPOINT	FREQ.	CUM. FREQ.	PCT.	CUM. PCT.
150	1	1	0.02	0.02
162	198	199	4.06	4.08
174	9	208	0.18	4.27
186	3	211	0.06	4.33
198	0	211	0.00	4.33
210	75	286	1.54	5.87
222	10	296	0.21	6.07
234	1	297	0.02	6.09
246	3	300	0.06	6.16
258	0	300	0.00	6.16
270	0	300	0.00	6.16
282	1	301	0.02	6.18
294	169	470	3.47	9.64
306	1145	1615	23.49	33.14
318	1086	2701	22.28	55.42
330	420	3121	8.62	64.03
342	102	3223	2.09	66.13
354	33	3256	0.68	66.80
366	197	3453	4.04	70.85
378	521	3974	10.69	81.53
390	575	4549	11.80	93.33
402	247	4796	5.07	98.40
414	55	4851	1.13	99.53
426	20	4871	0.41	99.94
438	3	4874	0.06	100.00

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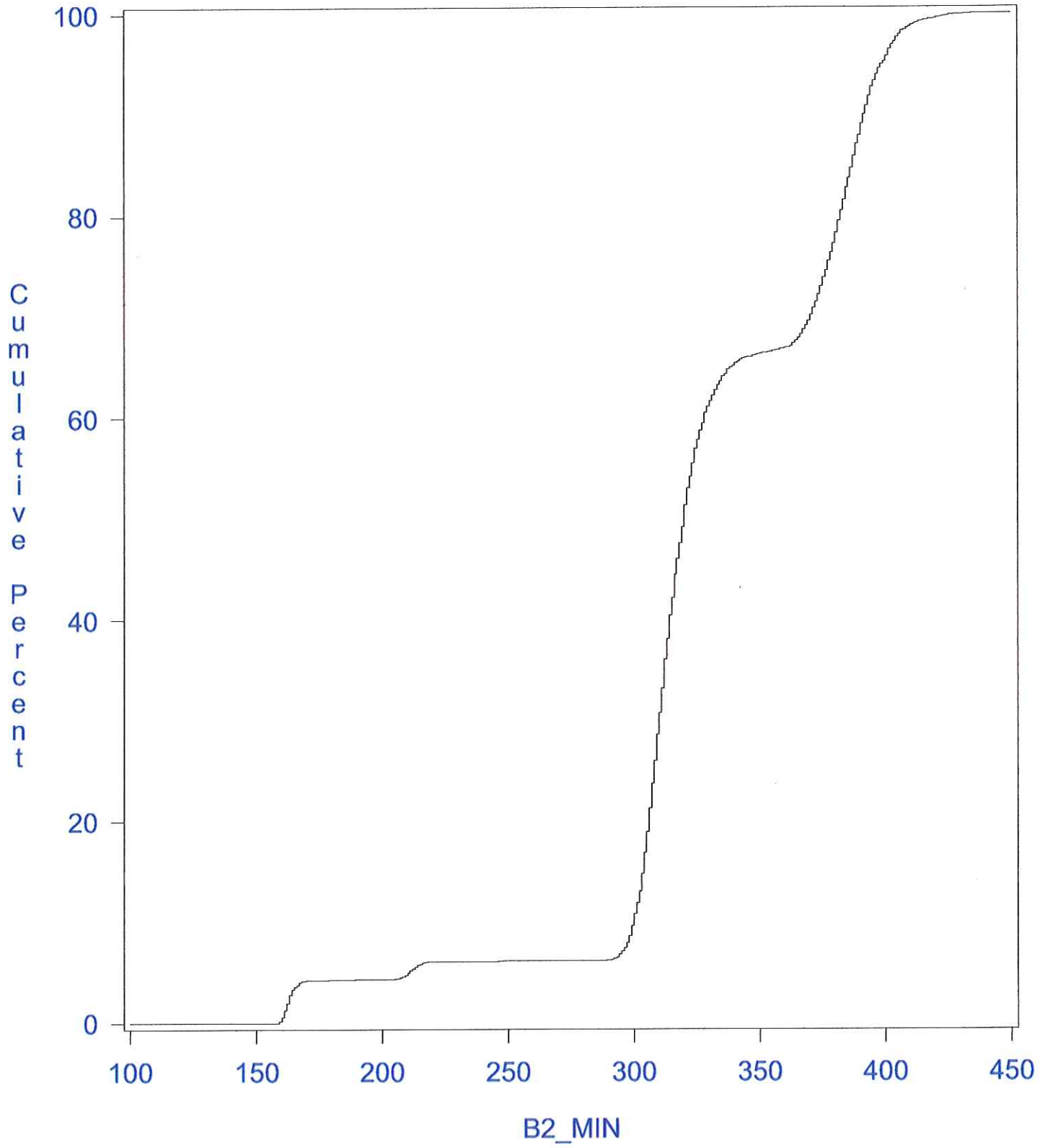
Analysis of Zug Island Baghouse Fan Amps - B2

Based on 2006 Hourly Maximum Observed Fan Amps



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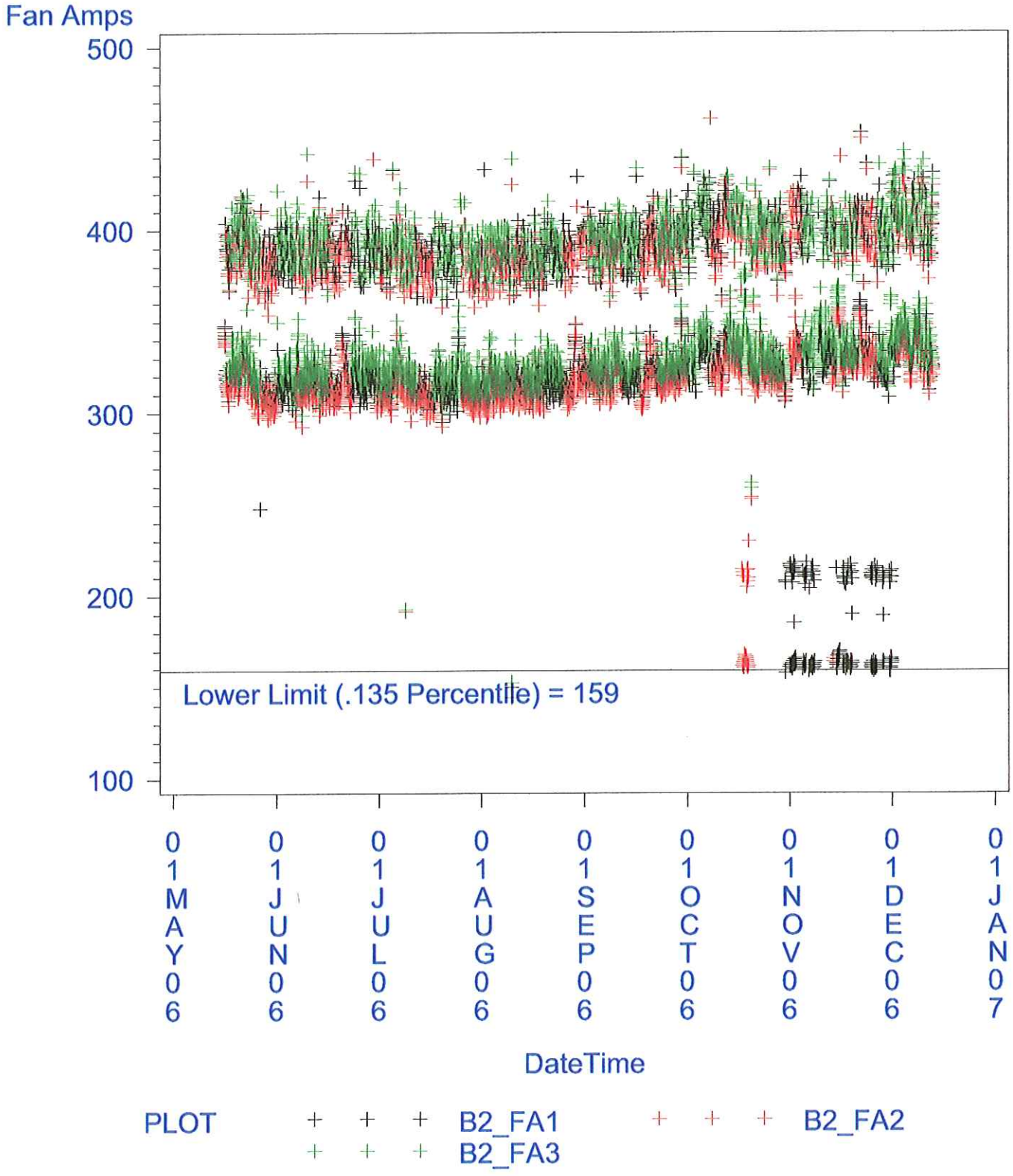
Analysis of Zug Island Baghouse Fan Amps - B2

Based on 2006 Hourly Maximum Observed Fan Amps



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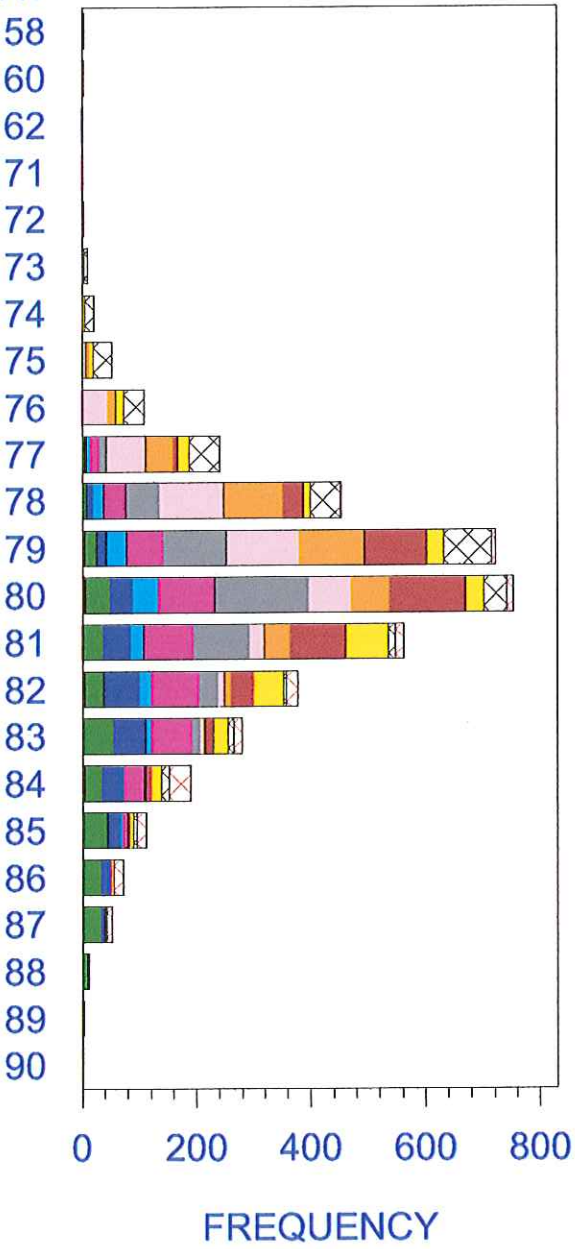
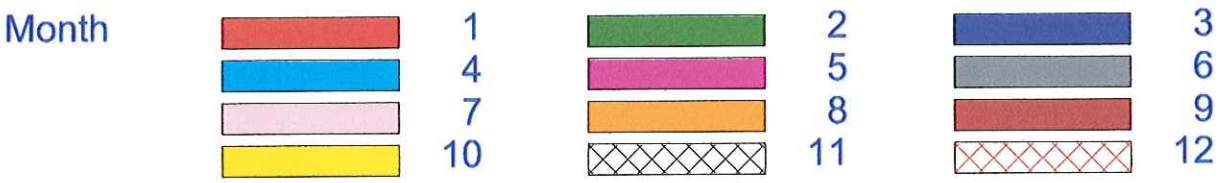
Analysis of Zug Island Baghouse Fan Amps - D4

Based on 2006 Hourly Maximum Observed Fan Amps



D4_FA1	FREQ.	CUM. FREQ.	PCT.	CUM. PCT.
58	4	4	0.10	0.10
60	2	6	0.05	0.15
62	1	7	0.02	0.17
71	1	8	0.02	0.20
72	3	11	0.07	0.27
73	10	21	0.25	0.52
74	21	42	0.52	1.04
75	51	93	1.27	2.31
76	109	202	2.71	5.01
77	241	443	5.98	11.00
78	453	896	11.24	22.24
79	722	1618	17.92	40.16
80	753	2371	18.69	58.85
81	561	2932	13.92	72.77
82	378	3310	9.38	82.15
83	279	3589	6.92	89.08
84	189	3778	4.69	93.77
85	112	3890	2.78	96.55
86	71	3961	1.76	98.31
87	52	4013	1.29	99.60
88	12	4025	0.30	99.90
89	3	4028	0.07	99.98
90	1	4029	0.02	100.00



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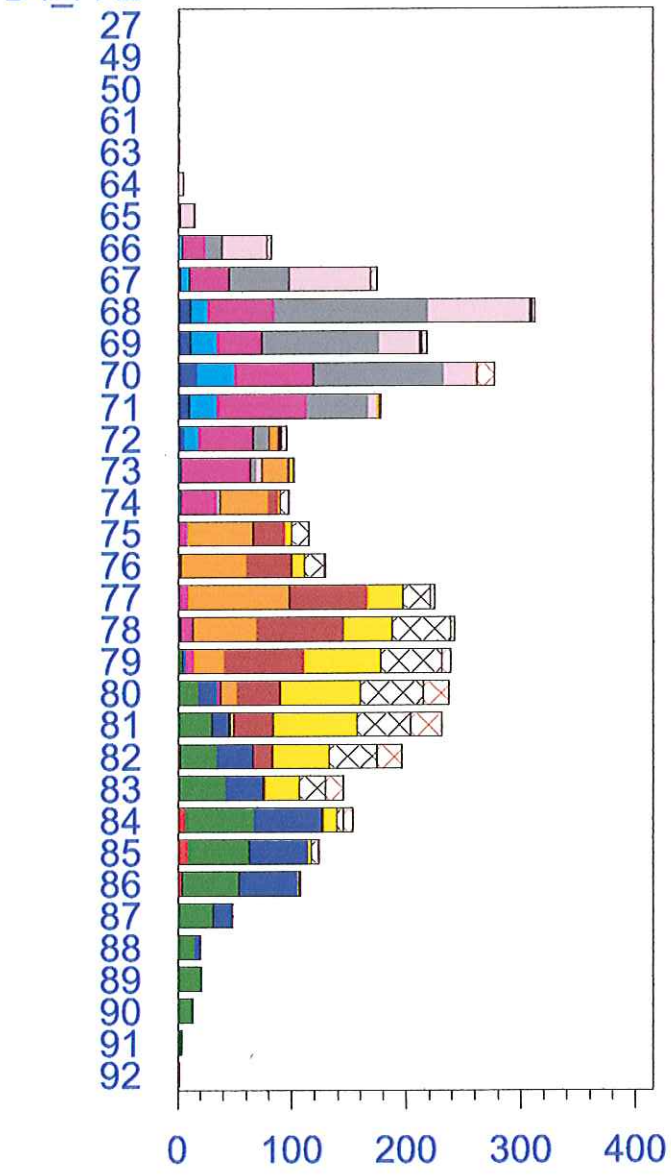
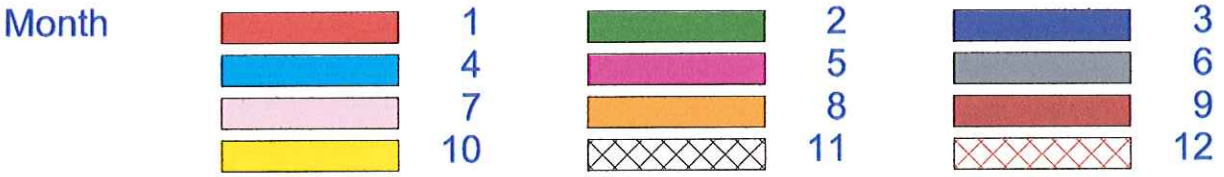
Analysis of Zug Island Baghouse Fan Amps - D4

Based on 2006 Hourly Maximum Observed Fan Amps



D4_FA2	FREQ.	CUM. FREQ.	PCT.	CUM. PCT.
27	1	1	0.03	0.03
49	1	2	0.03	0.05
50	1	3	0.03	0.08
61	1	4	0.03	0.10
63	1	5	0.03	0.13
64	5	10	0.13	0.26
65	15	25	0.39	0.66
66	82	107	2.15	2.81
67	174	281	4.56	7.37
68	312	593	8.18	15.56
69	218	811	5.72	21.27
70	277	1088	7.27	28.54
71	178	1266	4.67	33.21
72	95	1361	2.49	35.70
73	102	1463	2.68	38.38
74	98	1561	2.57	40.95
75	115	1676	3.02	43.97
76	129	1805	3.38	47.35
77	225	2030	5.90	53.25
78	242	2272	6.35	59.60
79	239	2511	6.27	65.87
80	237	2748	6.22	72.09
81	231	2979	6.06	78.15
82	196	3175	5.14	83.29
83	145	3320	3.80	87.09
84	153	3473	4.01	91.11
85	124	3597	3.25	94.36
86	108	3705	2.83	97.19
87	48	3753	1.26	98.45
88	20	3773	0.52	98.98
89	21	3794	0.55	99.53
90	13	3807	0.34	99.87
91	4	3811	0.10	99.97
92	1	3812	0.03	100.00



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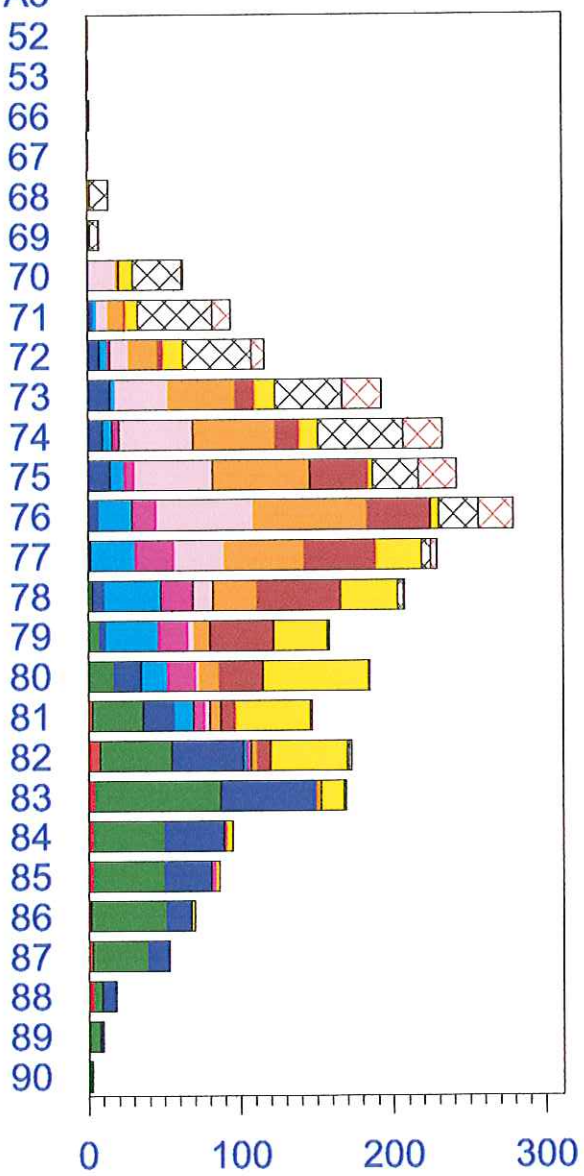
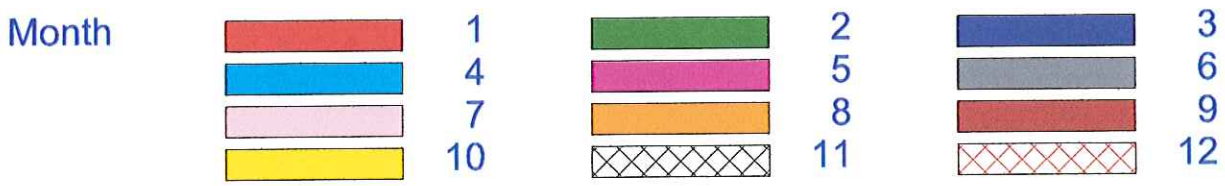
Analysis of Zug Island Baghouse Fan Amps - D4

Based on 2006 Hourly Maximum Observed Fan Amps



D4_FA3	FREQ.	CUM. FREQ.	PCT.	CUM. PCT.
52	1	1	0.04	0.04
53	1	2	0.04	0.07
66	2	4	0.07	0.14
67	1	5	0.04	0.18
68	14	19	0.49	0.67
69	8	27	0.28	0.95
70	63	90	2.21	3.16
71	94	184	3.30	6.45
72	116	300	4.07	10.52
73	193	493	6.77	17.29
74	233	726	8.17	25.46
75	242	968	8.49	33.95
76	279	1247	9.79	43.74
77	229	1476	8.03	51.77
78	208	1684	7.30	59.07
79	158	1842	5.54	64.61
80	185	2027	6.49	71.10
81	147	2174	5.16	76.25
82	173	2347	6.07	82.32
83	169	2516	5.93	88.25
84	95	2611	3.33	91.58
85	86	2697	3.02	94.60
86	70	2767	2.46	97.05
87	53	2820	1.86	98.91
88	18	2838	0.63	99.54
89	10	2848	0.35	99.89
90	3	2851	0.11	100.00



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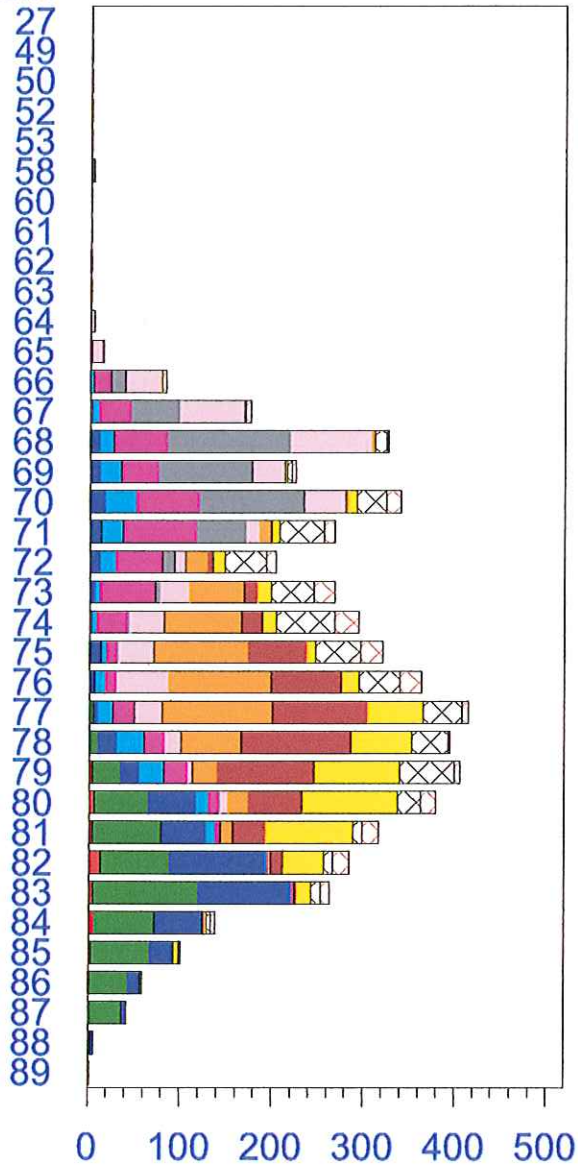
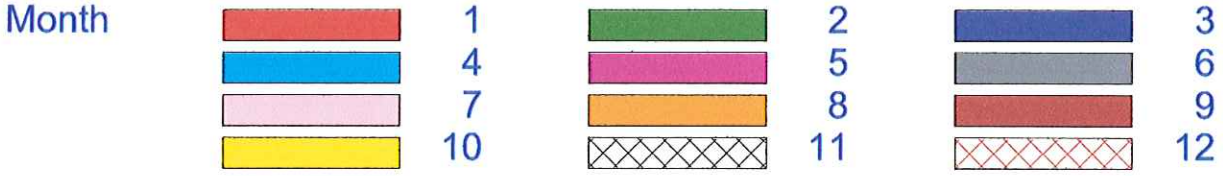
Analysis of Zug Island Baghouse Fan Amps - D4

Based on 2006 Hourly Maximum Observed Fan Amps



D4_MIN	FREQ.	CUM. FREQ.	PCT.	CUM. PCT.
27	1	1	0.02	0.02
49	1	2	0.02	0.04
50	1	3	0.02	0.05
52	1	4	0.02	0.07
53	1	5	0.02	0.09
58	4	9	0.07	0.16
60	1	10	0.02	0.18
61	1	11	0.02	0.19
62	1	12	0.02	0.21
63	1	13	0.02	0.23
64	5	18	0.09	0.32
65	15	33	0.26	0.58
66	83	116	1.46	2.03
67	175	291	3.07	5.10
68	326	617	5.72	10.82
69	225	842	3.95	14.77
70	340	1182	5.96	20.73
71	268	1450	4.70	25.43
72	203	1653	3.56	28.99
73	268	1921	4.70	33.69
74	294	2215	5.16	38.85
75	321	2536	5.63	44.48
76	363	2899	6.37	50.84
77	414	3313	7.26	58.10
78	394	3707	6.91	65.01
79	405	4112	7.10	72.12
80	379	4491	6.65	78.76
81	316	4807	5.54	84.30
82	284	5091	4.98	89.28
83	263	5354	4.61	93.90
84	138	5492	2.42	96.32
85	101	5593	1.77	98.09
86	59	5652	1.03	99.12
87	42	5694	0.74	99.86
88	6	5700	0.11	99.96
89	2	5702	0.04	100.00



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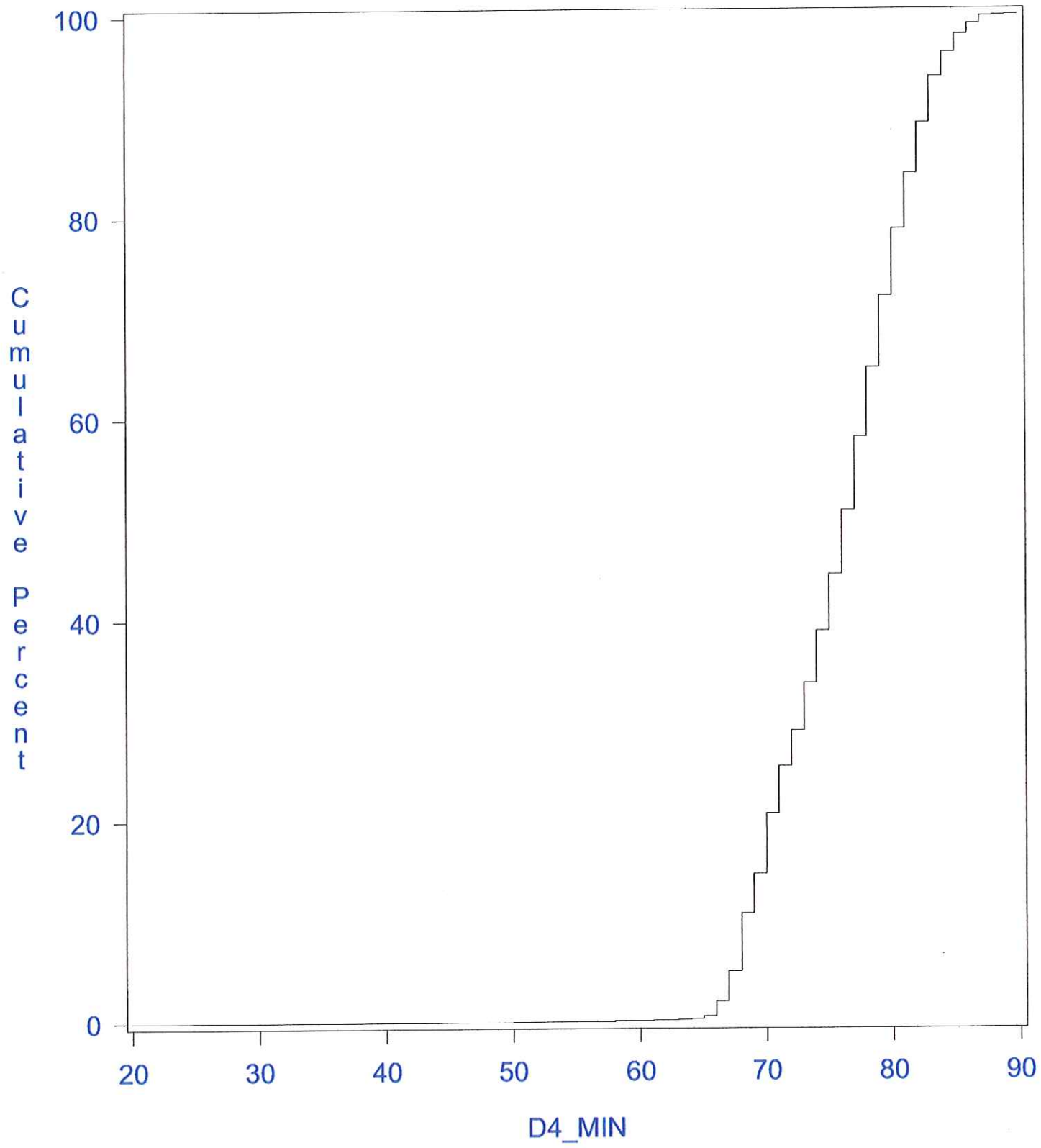
Analysis of Zug Island Baghouse Fan Amps - D4

Based on 2006 Hourly Maximum Observed Fan Amps



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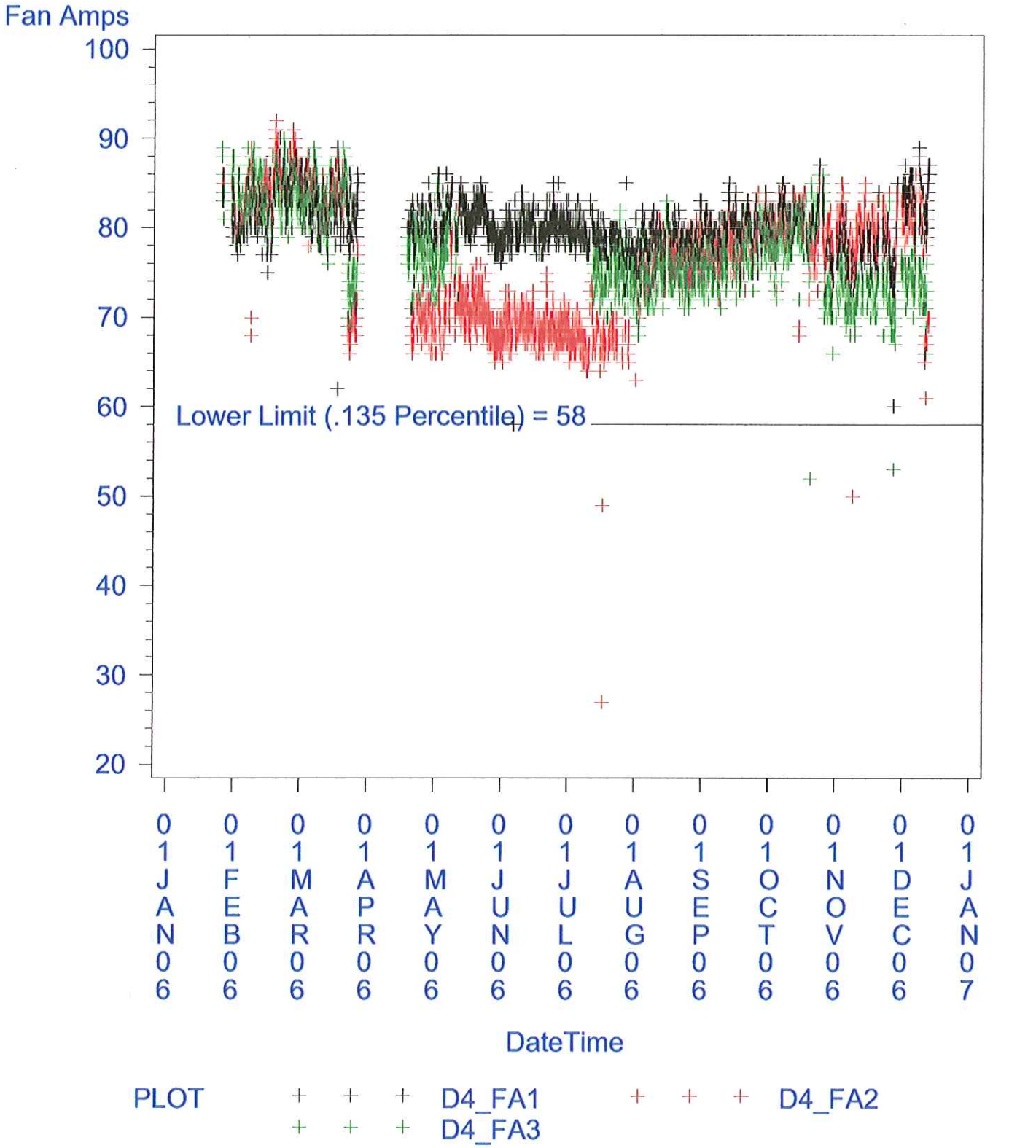
Analysis of Zug Island Baghouse Fan Amps - D4

Based on 2006 Hourly Maximum Observed Fan Amps



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Appendix D - MACT Alarm Corrective Action Procedure 63.7800(b)(4)
Reference: Blast Furnace O & M Plan Sections 2.2.3 & 2.3.4

BF Operation & Maintenance MACT Plan Revision History
Revision 1 – October 20, 2006

Item #	Revised Section	Description	Basis
1	2.2.1.1	Revised first sentence to specify for B-2 & D-4 BF Casthouse capture system only	40 CFR 63.7790(b)(1) specifies capture system requirement for BF Casthouse system
2	2.2.2.1	Revised first sentence to specify for B-2 & D-4 BF Casthouse capture system only	40 CFR 63.7790(b)(3) specifies control equipment requirement for BF Casthouse system
3	2.2.3.1	Revised first sentence to specify for B-2 & D-4 BF Casthouse capture system only	See Basis in Item 1
4	2.2.5.1	Revised first sentence to specify for B-2 & D-4 BF Casthouse capture system only	40 CFR 63.7830(b)(1) through (8) references MACT inspection requirements for a dust collector control device
5	2.2.3.7	Added in fan amp limits.	40 CFR 63.7800(b)(3)(iii) requires fan amp limit.
6			
7			
8			
9			
10			