

07-172-91

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11/11/90

MASTER

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NINE MILE POINT NUCLEAR STATION UNIT 2

2 VBA * UPS 2A ELECTRICAL PREVENTIVE MAINTENANCE PROCEDURE

ASSOC. EQUIP. _____

PROCEDURE NO. N2-EPM-GEN-RF635

2

11-6-90

UPS INVERTER CLEANING AND INSPECTION

DATE AND INITIALS

<u>APPROVALS</u>	<u>SIGNATURES</u>	<u>REVISION 1</u>	<u>REVISION 2</u>	<u>REVISION 3</u>
Site Superintendent Maintenance - Nuclear K. A. Dahlberg	<u>K A Dahlberg</u>			
Station Superintendent NMPNS Unit 2 R. B. Abbott	<u>R B Abbott</u>			
General Superintendent Nuclear Generation J. L. Willis	<u>J L Willis</u>			

CONTROLLED COPY

Summary of Pages

Revision 1 (Effective 7/21/88)

<u>Pages</u>	<u>Date</u>
5,8	July 1986
4,6,7	July 1988
*1-3	April 1990 (Publication Change)
Periodic Review, 4/2/90, No Change	

NIAGARA MOHAWK POWER CORPORATION

THIS PROCEDURE NOT TO BE
USED AFTER April 1992
SUBJECT TO PERIODIC REVIEW.

CONTROLLED WORKING COPY
VERIFIED BY John Hixby
NOT TO BE USED AFTER 4/8/90 12:30
DATE/TIME

9305040302 911031
PDR ADDCK 05000410
S PDR

9305040302

REGISTER

NO. 1000

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UPS INVERTER CLEANING AND INSPECTION

1.0 PURPOSE

1.1 This procedure describes the steps necessary to perform cleaning and inspection of the Safety Related Uninterruptible Power Supply (UPS) Inverters.

1.2 Applicability

This procedure is applicable to the Safety Related UPS Inverters located as follows:

<u>EQUIPMENT</u>	<u>NORMAL POWER</u>	<u>ALTERNATE POWER</u>	<u>BACKUP POWER</u>
2VBA*UPS2A	2EJS*PNL100A-7	2LAC*PNL100A-19	2BYS*SWG002A-3C
2VBA*UPS2B	2EJS*PNL300B-7	2LAC*PNL300B-19	2BYS*SWG002B-3C

LOCATION - CBS, EL. 261'

1.3 Frequency

This procedure should normally be performed only when inverters are taken out of service, or a refueling outage.

1.4 Safety Classification

Safety Related

1.5 Safety Related Maintenance Requirements

1.5.1 The Safety Related UPS Inverters are qualified for a mild environment.

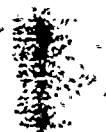
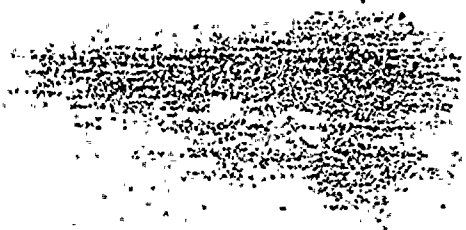
1.5.2 The safety-related maintenance requirements of EQMPOS-E035AAA Rev. 4 and E035AAB Rev. 4 are incorporated in this procedure, as applicable. *

2.0 REFERENCES

2.1 NMPC Accident Prevention Rules

2.2 AP-4.2 Control of Equipment Markups, Revision 04 *

2.3 Elgar Corp. Instruction Manual, DOCNO: UPS-253-1-106, Access No: 430002188, NMPC File Sequence No. N20349 *

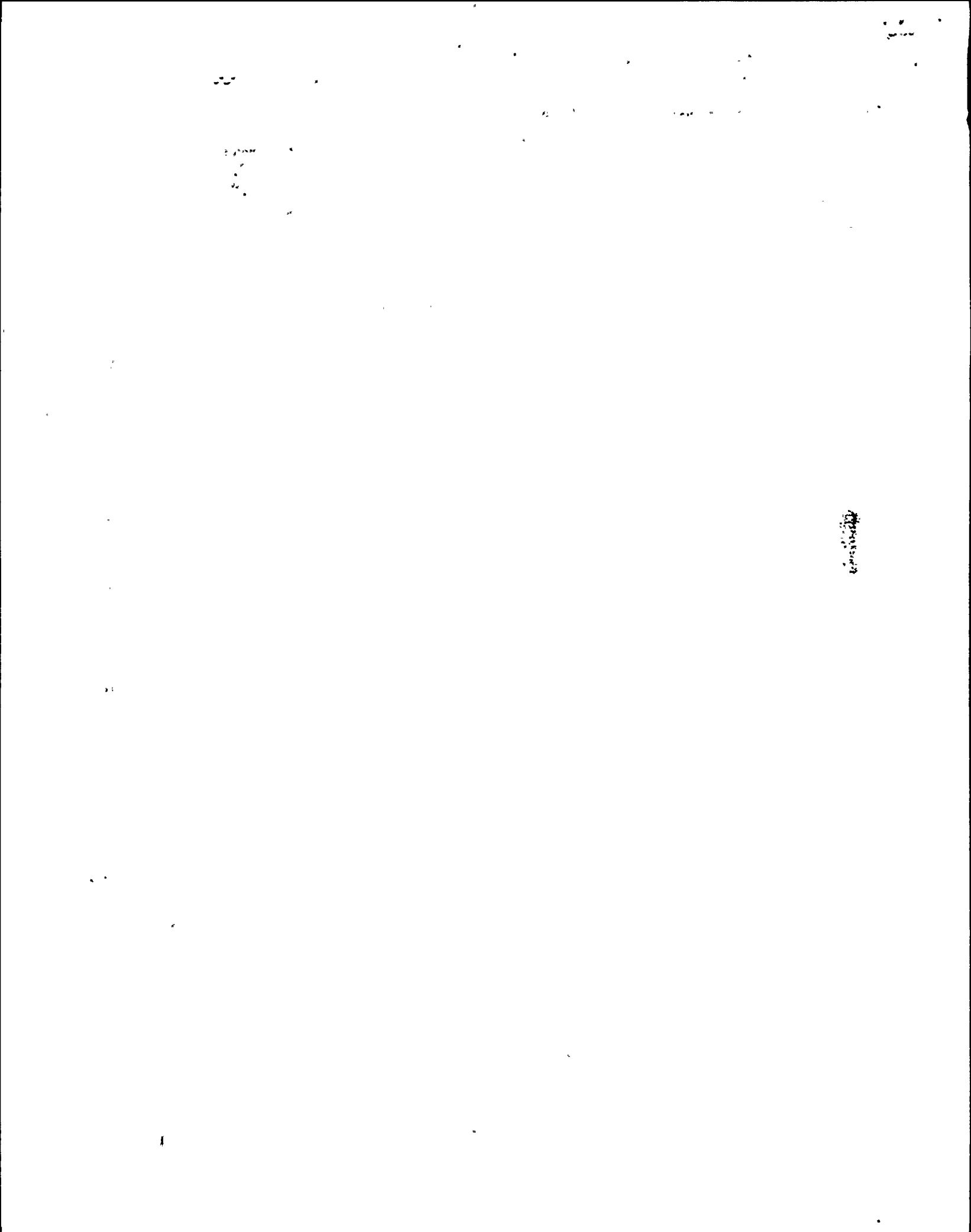


- 2.4 EQMPS-E035AAA, E035AAB Revision 4
- 2.5 12177-EE-001CB, 001CC, 001CM, and 001CN One Line Drawings
- 2.6 O&M - 169
- 2.7 SIL-343

- 3.0 TECHNICAL SPECIFICATIONS
- 3.1 Section 3/4.8.3, Onsite Power Distribution
- 3.2 Section 3/4.8.2, DC Sources

- 4.0 MEASURING AND TEST EQUIPMENT, SPECIAL TOOLS, AND MATERIALS
- 4.1 M&T
N/A
- 4.2 Special Tools
- 4.2.1 Vacuum cleaner with non-metallic wand and soft bristle brush attachment.
- 4.3 Materials
N/A
- 4.3.1 Air Filters

- 5.0 PRECAUTIONS AND LIMITATIONS
- 5.1 Prior to performing maintenance transfer the UPS to its alternate AC supply. If alternate AC supply circuit is energized entire alternate supply section in UPS is energized and output cables travel through inverter section of UPS.
- 5.2 Personnel shall comply with the requirements of NMPC Accident Prevention Rules.
- 5.3 If any reportable problems are determined while performing maintenance on the equipment, notify both the Assistant Maintenance Supervisor and SSS and determine if an Occurrence Report should be initiated.
- 5.4 Always wear rubber gloves when working with equipment that may possibly be energized.



- 5.5 Voltage is present at many points inside the inverter even after the AC and DC breakers have been opened.
- 5.6 Static can damage UPS circuitry. If wiping is done be cautious of terminal connections and DO NOT wipe circuit cards. I.C. chips may be damaged.

6.0 PREREQUISITES

- 6.1 Plant Conditions - Outage
- 6.2 System Conditions - The inverter will be de-energized. The UPS will be fed from its alternate AC supply. If loose connections are found, UPS system including alternate supply must be de-energized in order to tighten.
- 6.3 Obtain permission from SSS to start work.

PLANT IMPACT: THE EQUIPMENT MARKED UP WILL NOT BE AVAILABLE FOR SERVICE. THE UPS LOADS WILL BE FED FROM ITS ALTERNATE AC SUPPLY.

- 6.4 Notify CSO of intent to perform maintenance.
- 6.5 Mark-Ups - Obtain mark-ups per AP-4.2. (equipment power supplies are listed in Section 1.2). *
- 6.6 Notify QA an initial on data sheet.
- 6.7 Personnel performing this procedure have read it in its entirety and are thoroughly familiar with its contents.

7.0 PROCEDURE

WARNING:

VOLTAGE IS PRESENT AT MANY POINTS INSIDE THE INVERTER EVEN AFTER THE AC AND DC BREAKERS HAVE BEEN OPENED. METER CAN BE USED TO VERIFY AREAS INSIDE INVERTER THAT ARE ENERGIZED AND DE-ENERGIZED.

NOTE: Use caution when cleaning the inside of the inverters not to damage components.

- 7.1 Ensure the inverter is de-energized and marked up.
- 7.2 Using a non-metallic vacuum wand and a soft bristle brush attachment, thoroughly clean the inside of the inverter.

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- 7.3 Clean or replace the air filters as necessary. (3 each per unit)
- 7.4 Inspect the inverters internal components for signs of overheating or discoloration.
- 7.5 Inspect internal wiring for signs of discoloration or frayed insulation.
- 7.6 Check internal wiring for loose connections. Tighten as necessary.
- 7.7 Check large power wiring terminal connections for tightness. Tighten as necessary. Tightness can be verified by visually verifying that lockwashers (split lockwashers) are flat.

8.0 RETURN TO NORMAL

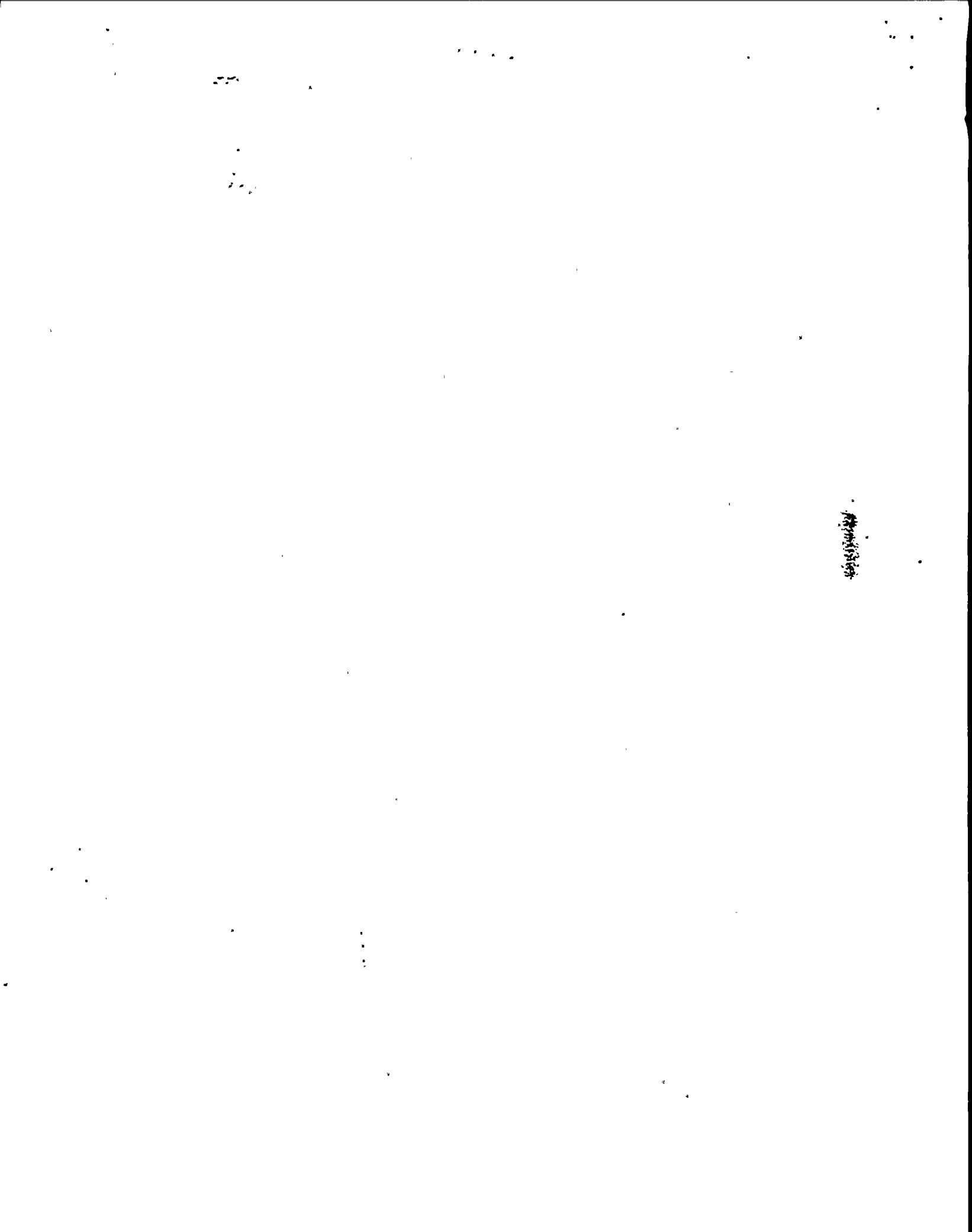
- 8.1 Surrender mark-ups to operations.
- 8.2 Operations notified equipment is available for post-maintenance test. The following tests are recommended:
 - 8.2.1 Establish equipment operation per applicable operating procedures.
 - 8.2.2 Verify voltage, current, frequency, and temperature are normal.

9.0 ACCEPTANCE CRITERIA

- 9.1 No corrective action required.

10.0 ATTACHMENTS

- 10.1 Single Phase Uninterruptible Power
- 10.2 Data Sheets

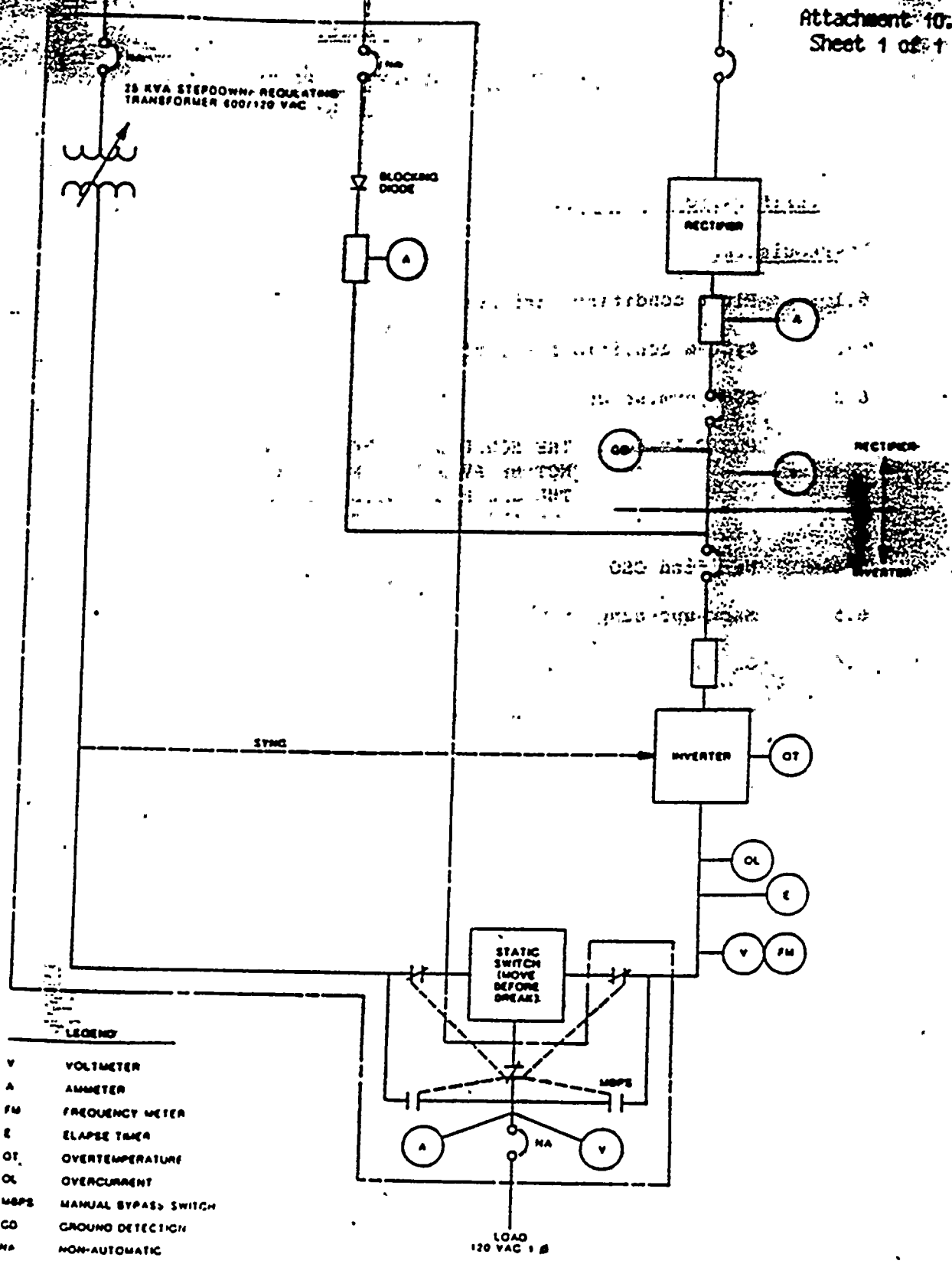


(Bypass)
Alternate AC Supply
600 VAC 1 ϕ

Backup DC Supply
125 VDC

Normal AC Supply
600 VAC 3 ϕ

Attachment 10.1
Sheet 1 of 1



- LEGEND**
- V VOLTMETER
 - A AMMETER
 - FM FREQUENCY METER
 - E ELAPSE TIMER
 - OT OVERTEMPERATURE
 - OL OVERCURRENT
 - MBS MANUAL BYPASS SWITCH
 - GD GROUND DETECTION
 - NA NON-AUTOMATIC

Equipment Piece No. 2UBA # ups 2A

Attachment 10.2
Sheet 1 of 3

DATA SHEET

UPS INVERTER CLEANING AND INSPECTION
N2-EPM-GEN-RF635

Initials/Date

A. VERIFICATION OF PROCEDURE STEPS:

Prerequisites

- | | | | |
|---|--|--------|--------------------|
| 6.1 | Plant conditions satisfactory. | Maint. | <u>JH 11/5/90</u> |
| 6.2 | System conditions satisfactory. | Maint. | <u>JH 11/5/90</u> |
| 6.3 | SSS permission. <u>ESL 90-766</u> | SSS | <u>JH 11/6/90</u> |
| <p>PLANT IMPACT: THE EQUIPMENT MARKED UP WILL NOT BE AVAILABLE FOR SERVICE. THE UPS LOADS WILL BE FED FROM ITS ALTERNATE AC SUPPLY.</p> | | | |
| 6.4 | Notified CSO. <u>2-90-01793</u> | CSO | <u>MWS 11/7/90</u> |
| 6.5 | Mark-ups hung. No. <u>2-90-01788</u> | Maint. | <u>QD 11/7/90</u> |
| 6.6 | QA notified. | Maint. | <u>QD 11/7/90</u> |
| 6.7 | Personnel familiar with procedure. | Maint. | <u>QD 11/7/90</u> |
| 7.0 | <u>Procedure</u> | | |
| 7.1 | Inverter is de-energized. | Maint. | <u>QD 11/7/90</u> |
| 7.2 | Cleaned inside of inverter with non-metallic wand. | Maint. | <u>QD 11/7/90</u> |
| 7.3 | Cleaned or replaced air filters. | Maint. | <u>QD 11/7/90</u> |
| 7.4 | Inspected components for signs of overheating/discoloration. | Maint. | <u>QD 11/7/90</u> |
| 7.5 | Inspected internal wiring for discoloration/frayed insulation. | Maint. | <u>QD 11/8/90</u> |
| 7.6 | Checked internal wiring connections for tightness. Tightened as necessary. | Maint. | <u>QD 11/8/90</u> |

Equipment Place No. 2 VBA * UPS 2A

Attachment: 10.2
Sheet 2 of 3

DATA SHEET

UPS INVERTER CLEANING AND INSPECTION
N2-EPM-GEN-RF635

Initials/Date

A. VERIFICATION OF PROCEDURE STEPS: (Cont'd)

7.7 Checked large power wiring terminals connections for tightness. Tightened as necessary. Maint. *JD 11/8/90*

8.0 Return to Normal

8.1 Mark-ups surrendered. Maint. *JD 11/8/90*

8.2 Operations notified equipment is available for post-maintenance test. Maint. *JD 11/8/90*

9.0 Acceptance Criteria

9.1 No corrective action required.

Signature Table

	<u>INITIALS</u>	<u>SIGNATURE</u>	<u>PRINTED NAME</u>
Performed by:	<i>JD</i>	<i>John D. ...</i>	<i>John D. ...</i>
Performed by:	_____	_____	_____
Performed by:	_____	_____	_____
Performed by:	_____	_____	_____
Performed by:	_____	_____	_____

B. RESULTS:

- Acceptable
- Acceptable with comments. Work Request No. _____
- Unsatisfactory, (Use Remarks section as necessary and initiate a Work Request). Work Request No. _____

Equipment Piece No. _____

Attachment 10.2
Sheet 3 of 3

DATA SHEET

UPS INVERTER CLEANING AND INSPECTION
N2-EPM-GEN-RF635

C. REMARKS:

D. REVIEW:

John Atkinson 11/18/90
Maintenance Man Date

Frank Top 11/18/90
Asst./Maintenance Supervisor Date

ESL 90-766

WORK IN PROGRESS DATA SHEET

- WR# _____
- P# _____
- Other _____
- Not Applicable

2VBA*UPS 2A
 Mark No. _____
 EPN _____
 Not Applicable

N2-EPM-GEN-RF 635
 Procedure No. NA

Estimated Duration: 10 HRS
 (Equipment Out of Service)

- Permissible Reactor / Job
- All
 - Run
 - Start-up
 - Hot Shutdown
 - Cold Shutdown
 - Refuel

DIV: I II III NA

Mark-up Required Yes No

EQUIPMENT IMPACT (LIST OUT OF SERVICE EQUIPMENT)

2VBA*UPS 2A out of service
TO WORK WITH NWS 87-037

PLANT IMPACT (REQUIRES OPERATION'S INPUT)

2HA H DIV I inputs to ERE computer limits the function of CS may require NRC notification

2HA H 2VBA*UPS 2A will cause an auto initiation of Div 1 SBT, isolation of R. Bldg Vent and auto start all Div 1 R. Bldg unit coolers

2HA H 2VBA*UPS 2A will cause an auto initiation of Div 2 Conts Bldg Special Filter Train and isolation of the special filter train bypass via 2HEV*MOVIA

2HA H 2VBA*UPS 2A will cause 2 RCS = HYV 17A to trip fail as is due to full load containment isolation when isolation SHUT in loss of power.

TECH SPEC 3.1.5. b (5) Standby Liquid Contact System

TECH SPEC 3.1.5. b (6) Secondary Containment Isolation

REFERENCE DRAWINGS: (LIST BELOW)

SS-1CA, CB, CC, CM, CN

COMMENTS: Will impact in place Div 1 SBT on P...
 Major impact to...
 Significant impact to...
 Minor impact to...

Prepared By: J. DISAW Date: 5/24/88 Tech Reviewer: MOI A. B... Date: _____

Reviewed with Crew By: [Signature] Supv/Chief Date: 5/24/88
 Permission Requested to Start By: [Signature] Date: 5/24/88
 Permission Granted to Start By: SSS [Signature] Date: 5/24/88
 Renotifications: / SSS / CSO / SSS / CSO / SSS

PLANNER & TECHNICAL REVIEWER

POST MAINTENANCE TESTS

PMT REQUIRED YES NO

TEST REQUIREMENTS

PROCEDURES

- NINE BPM GEN REF 35 Step No.'s 9/0 NA
- No Step No.'s NA
- No Step No.'s NA
- No Step No.'s NA

TESTS

Test	Acceptance Criteria
<input type="checkbox"/> Test	<input type="checkbox"/>
<input type="checkbox"/> Test	<input type="checkbox"/>
<input type="checkbox"/> Test	<input type="checkbox"/>
<input type="checkbox"/> Test	<input type="checkbox"/>

TEST RESULTS

Deferred	Sat	Performed By	Verified By
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Sat	<i>Mark A. Bold</i>	<i>Mark A. Bold</i>
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	/	/
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	/	/
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	/	/
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	/	/
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	/	/
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	/	/
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	/	/

PLANNER AND TECHNICAL REVIEWER

OPS ACCEPTANCE

Prepared by: *J. Dikhan* Date: *8/26/90*
 Technical Reviewer: *Mark A. Bold* Date: *10/2/90*

Reviewed by: *[Signature]* ASSS/SSS Date: *11/16/92*

Shaded section not used with WR/Document on WR
 Remarks:

Note: The below signature, when signed, declares the equipment operable at the date and time specified.

Accepted By: *[Signature]* SSS Date: *11/19/90* Time: *1:30*

Procedure Number
N2-EPM-GEN-R635 is currently
being revised. If there is any
TCN's, Pub Changes, or
performance problems, please
contact Donna Collins (x7121)
immediately. Thank you.

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MASTER

NINE MILE POINT NUCLEAR STATION UNIT 2
ELECTRICAL PREVENTIVE MAINTENANCE PROCEDURE

PROCEDURE NO. N2-EPM-GEN-RF635

2

UPS INVERTER CLEANING AND INSPECTION

<u>APPROVALS</u>	<u>SIGNATURES</u>	<u>REVISION 1</u>	<u>REVISION 2</u>	<u>REVISION 3</u>
Site Superintendent Maintenance - Nuclear K. A. Dahlberg	<u>K.A. Dahlberg</u>	<u>[Signature]</u>		
Station Superintendent NMPNS Unit 2 R. B. Abbott	<u>R.B. Abbott</u>	<u>[Signature]</u>		
General Superintendent Nuclear Generation J. L. Willis	<u>[Signature]</u>	<u>[Signature]</u>		

RECEIVED
7/21/88

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Summary of Pages

Revision 1 (Effective 7/21/88)

<u>Pages</u>	<u>Date</u>
5,8	July 1986
4,6,7	July 1988
*1-3	April 1990 (Publication Change)
Periodic Review, 4/2/90, No Change	

NIAGARA MOHAWK POWER CORPORATION

THIS PROCEDURE NOT TO BE
USED AFTER April 1992
SUBJECT TO PERIODIC REVIEW.

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WINDY

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UPS INVERTER CLEANING AND INSPECTION

1.0 PURPOSE

1.1 This procedure describes the steps necessary to perform cleaning and inspection of the Safety Related Uninterruptible Power Supply (UPS) Inverters.

1.2 Applicability

This procedure is applicable to the Safety Related UPS Inverters located as follows:

<u>EQUIPMENT</u>	<u>NORMAL POWER</u>	<u>ALTERNATE POWER</u>	<u>BACKUP POWER</u>
2VBA*UPS2A	2EJS*PNL100A-7	2LAC*PNL100A-19	2BYS*SWG002A-3C
2VBA*UPS2B	2EJS*PNL300B-7	2LAC*PNL300B-19	2BYS*SWG002B-3C

LOCATION - CBS, EL. 261'

1.3 Frequency

This procedure should normally be performed only when inverters are taken out of service, or a refueling outage.

1.4 Safety Classification

Safety Related

1.5 Safety Related Maintenance Requirements

1.5.1 The Safety Related UPS Inverters are qualified for a mild environment.

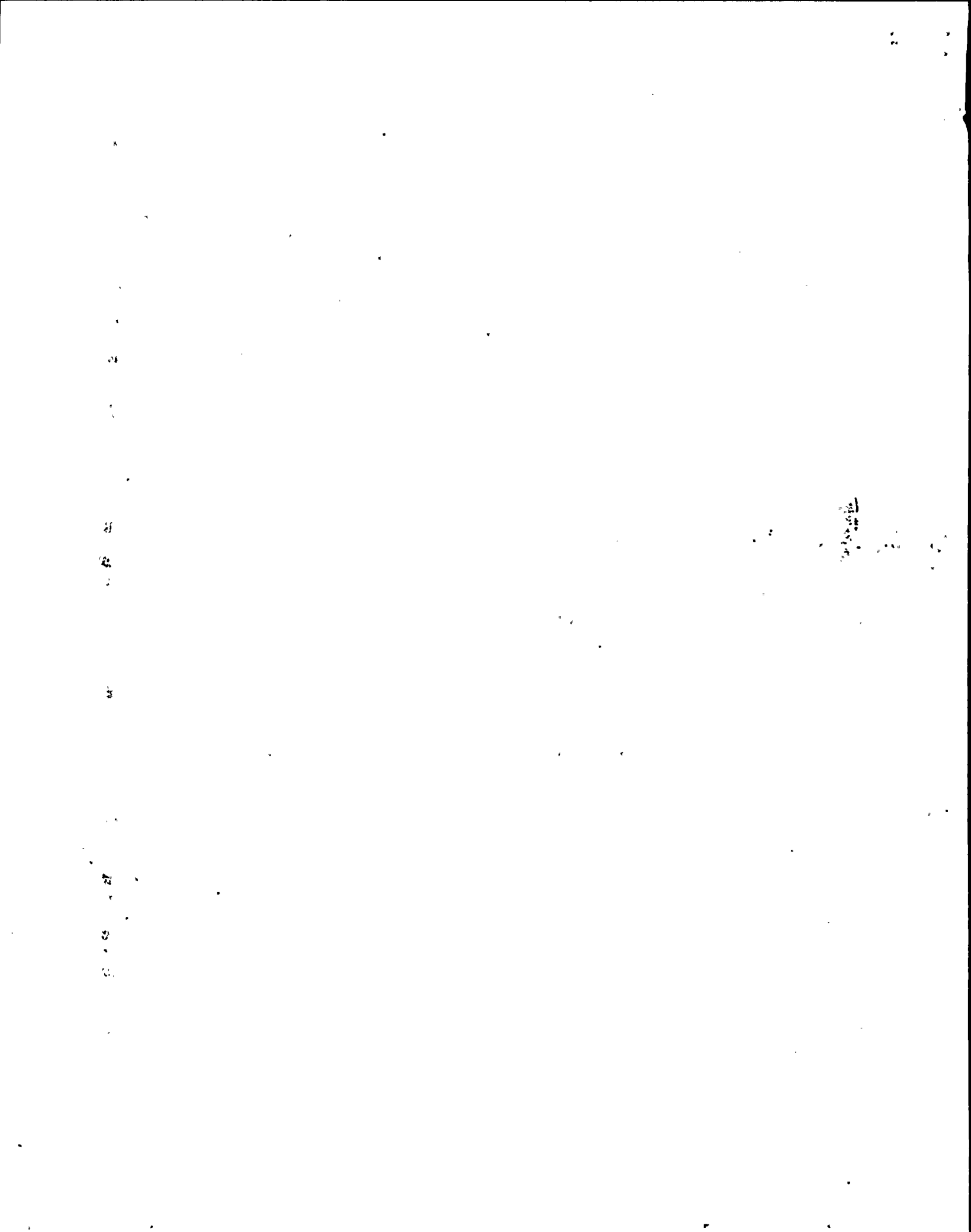
1.5.2 The safety-related maintenance requirements of EQMPOS-E035AAA Rev. 4 and E035AAB Rev. 4 are incorporated in this procedure, as applicable. *

2.0 REFERENCES

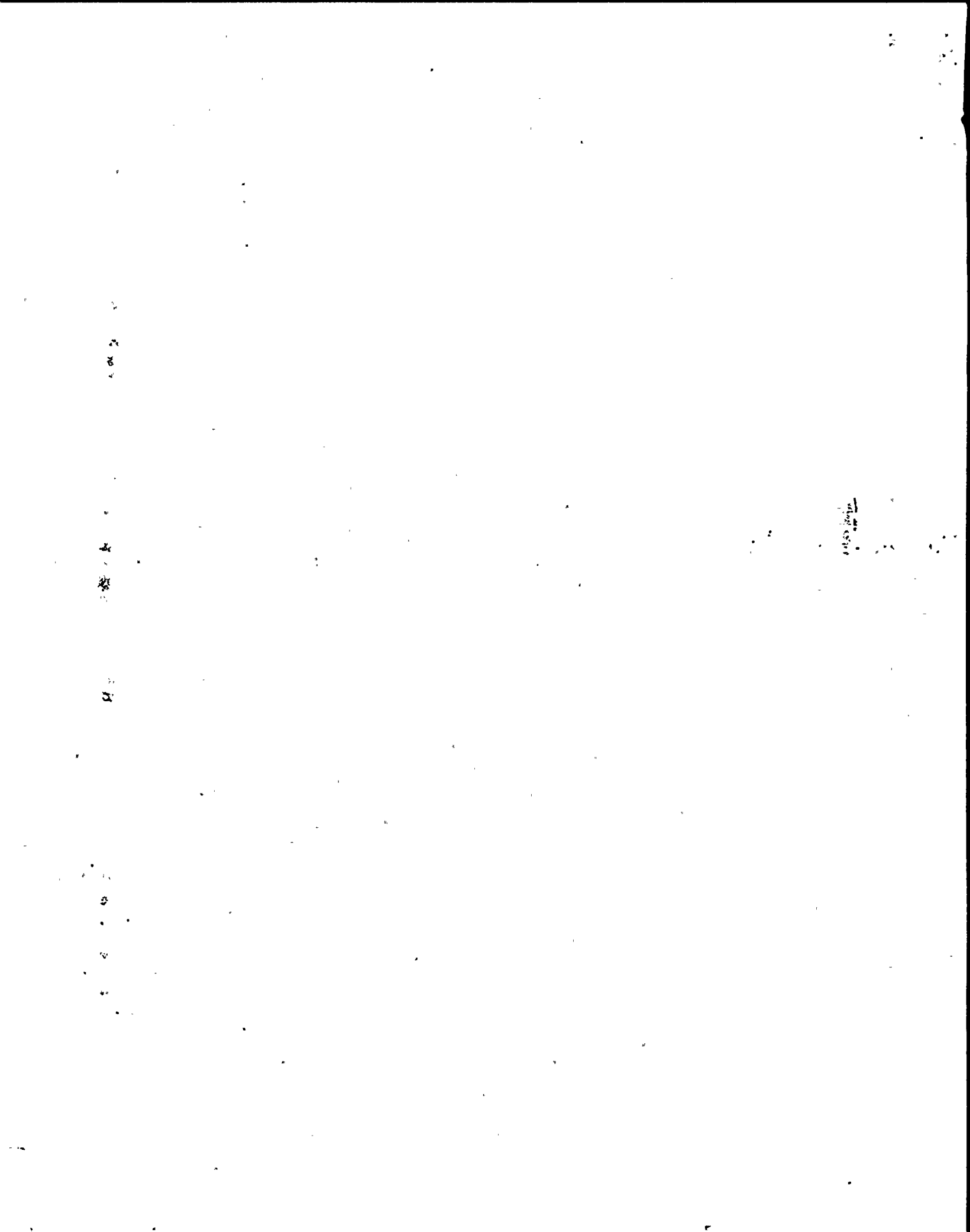
2.1 NMPC Accident Prevention Rules

2.2 AP-4.2 Control of Equipment Markups, Revision 04 *

2.3 Elgar Corp. Instruction Manual, DOCNO: UPS-253-1-106, Access No: 430002188, NMPC File Sequence No. N20349 *



- 2.4 EQMPDS-E035AAA, E035AAB Revision 4 *
- 2.5 12177-EE-001CB, 001CC, 001CM, and 001CN One Line Drawings *
- 2.6 O&MR - 169
- 2.7 SIL-343
- 3.0 TECHNICAL SPECIFICATIONS
- 3.1 Section 3/4.8.3, Onsite Power Distribution
- 3.2 Section 3/4.8.2, DC Sources
- 4.0 MEASURING AND TEST EQUIPMENT, SPECIAL TOOLS, AND MATERIALS
- 4.1 M&TE
N/A
- 4.2 Special Tools
- 4.2.1 Vacuum cleaner with non-metallic wand and soft bristle brush attachment.
- 4.3 Materials
N/A
- 4.3.1 Air Filters
- 5.0 PRECAUTIONS AND LIMITATIONS
- 5.1 Prior to performing maintenance transfer the UPS to its alternate AC supply. If alternate AC supply circuit is energized entire alternate supply section in UPS is energized and output cables travel through inverter section of UPS.
- 5.2 Personnel shall comply with the requirements of NMPC Accident Prevention Rules.
- 5.3 If any reportable problems are determined while performing maintenance on the equipment, notify both the Assistant Maintenance Supervisor and SSS and determine if an Occurrence Report should be initiated.
- 5.4 Always wear rubber gloves when working with equipment that may possibly be energized.



5.5 Voltage is present at many points inside the inverter even after the AC and DC breakers have been opened.

5.6 Static can damage UPS circuitry. If wiping is done be cautious of small terminal connections and DO NOT wipe circuit cards. I.C. chips may be damaged.

6.0 PREREQUISITES

6.1 Plant Conditions - Outage

6.2 System Conditions - The inverter will be de-energized. The UPS will be fed from its alternate AC supply. If loose connections are found, UPS system including alternate supply must be de-energized in order to tighten.

6.3 Obtain permission from SSS to start work.

PLANT IMPACT: THE EQUIPMENT MARKED UP WILL NOT BE AVAILABLE FOR SERVICE. THE UPS LOADS WILL BE FED FROM ITS ALTERNATE AC SUPPLY.

6.4 Notify CSO of intent to perform maintenance.

6.5 Mark-Ups - Obtain mark-ups per AP-4.2 (equipment power supplies are listed in Section 1.2). *

6.6 Notify QA an initial on data sheet.

6.7 Personnel performing this procedure have read it in its entirety and are thoroughly familiar with its contents.

7.0 PROCEDURE

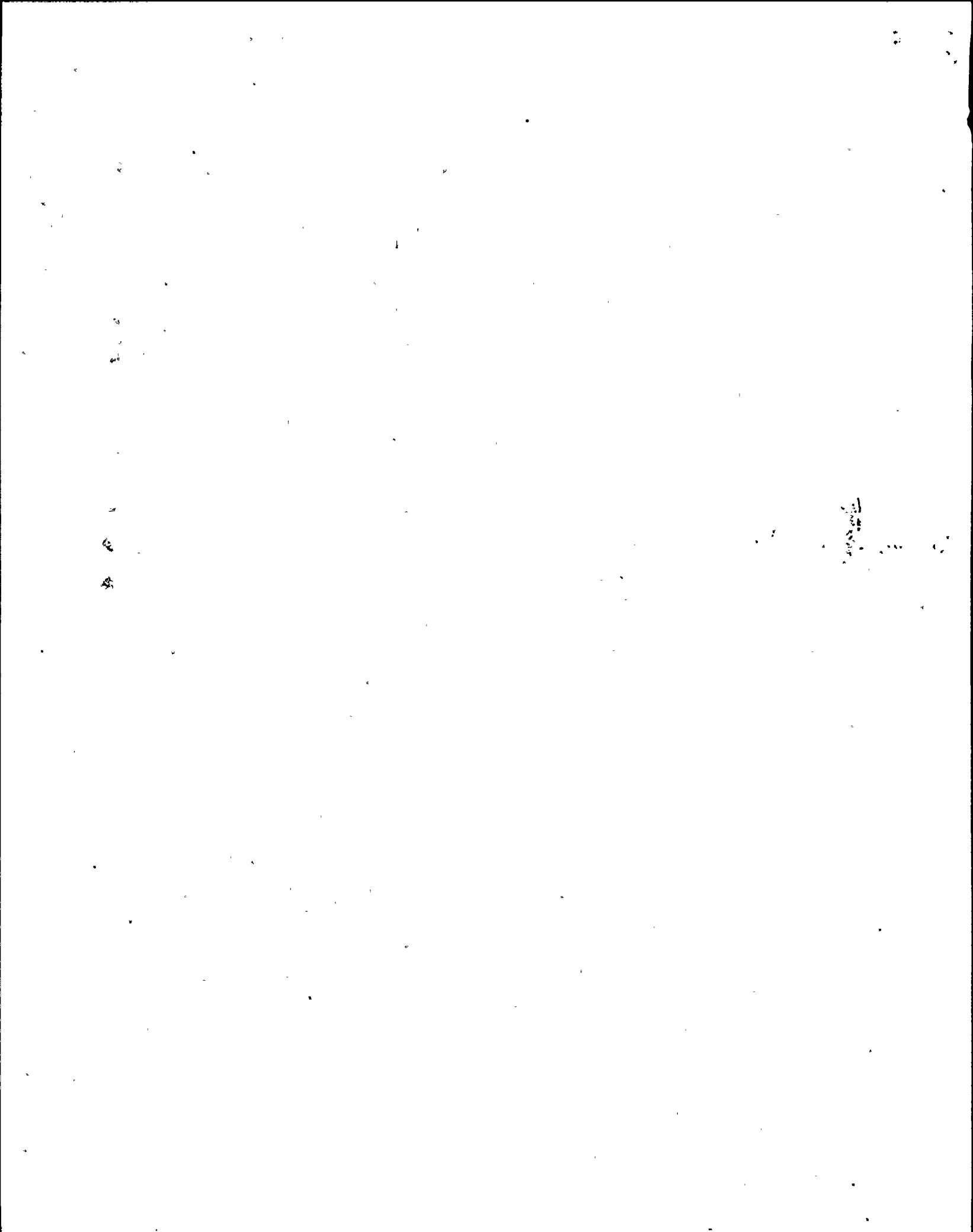
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VOLTAGE IS PRESENT AT MANY POINTS INSIDE THE INVERTER EVEN AFTER THE AC AND DC BREAKERS HAVE BEEN OPENED. METER CAN BE USED TO VERIFY AREAS INSIDE INVERTER THAT ARE ENERGIZED AND DE-ENERGIZED.

NOTE: Use caution when cleaning the inside of the inverters not to damage components.

7.1 Ensure the inverter is de-energized and marked up.

7.2 Using a non-metallic vacuum wand and a soft bristle brush attachment, thoroughly clean the inside of the inverter.



- 7.3 Clean or replace the air filters as necessary. (3 each per unit) | 1
- 7.4 Inspect the inverters internal components for signs of overheating or discoloration.
- 7.5 Inspect internal wiring for signs of discoloration or frayed insulation.
- 7.6 Check internal wiring for loose connections. Tighten as necessary.
- 7.7 Check large power wiring terminal connections for tightness. Tighten as necessary. Tightness can be verified by visually verifying that lockwashers (split lockwashers) are flat. | 1

8.0 RETURN TO NORMAL

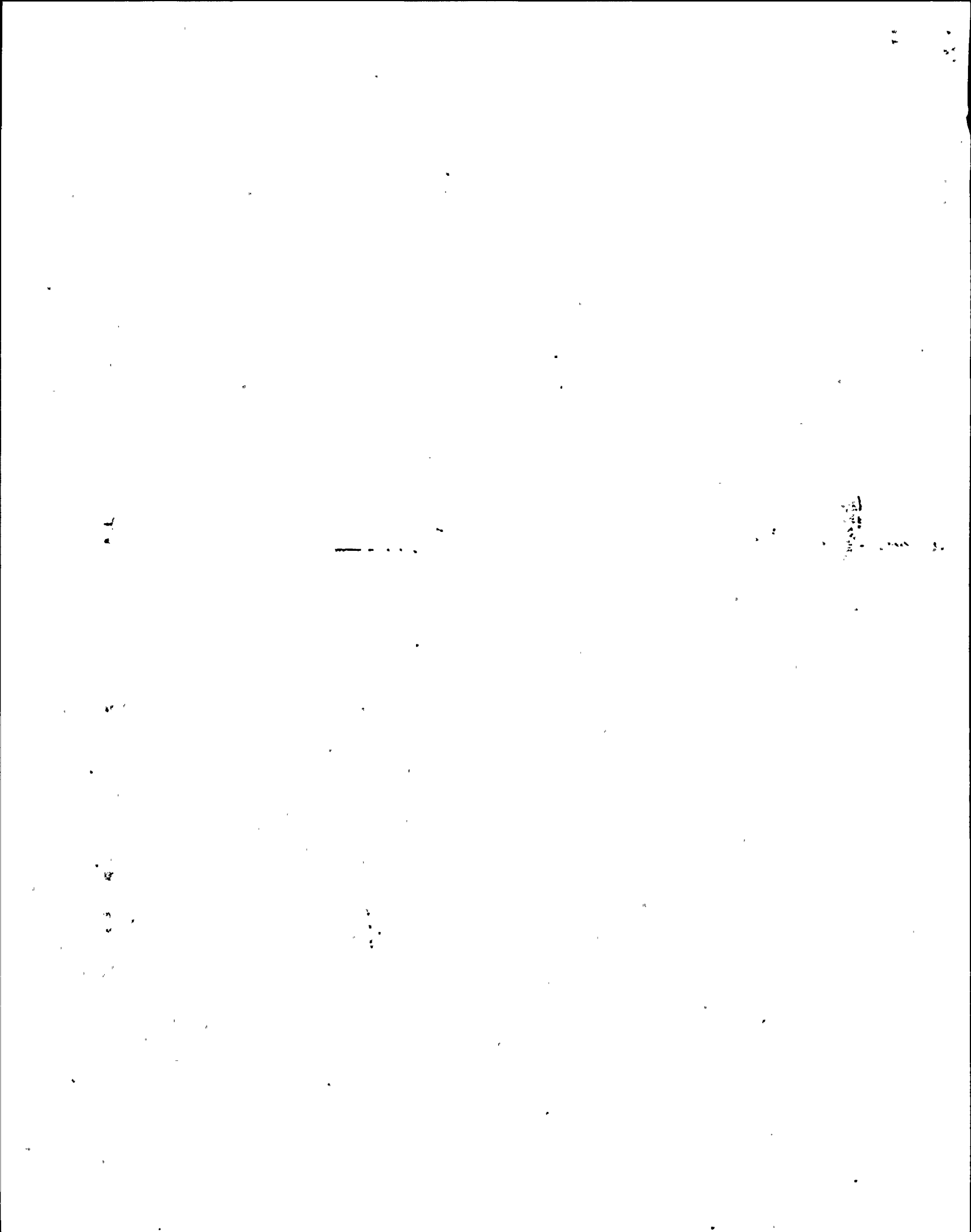
- 8.1 Surrender mark-ups to operations.
- 8.2 Operations notified equipment is available for post-maintenance test. The following tests are recommended.
- 8.2.1 Establish equipment operation per applicable operating procedures.
- 8.2.2 Verify voltage, current, frequency, and temperature are normal.

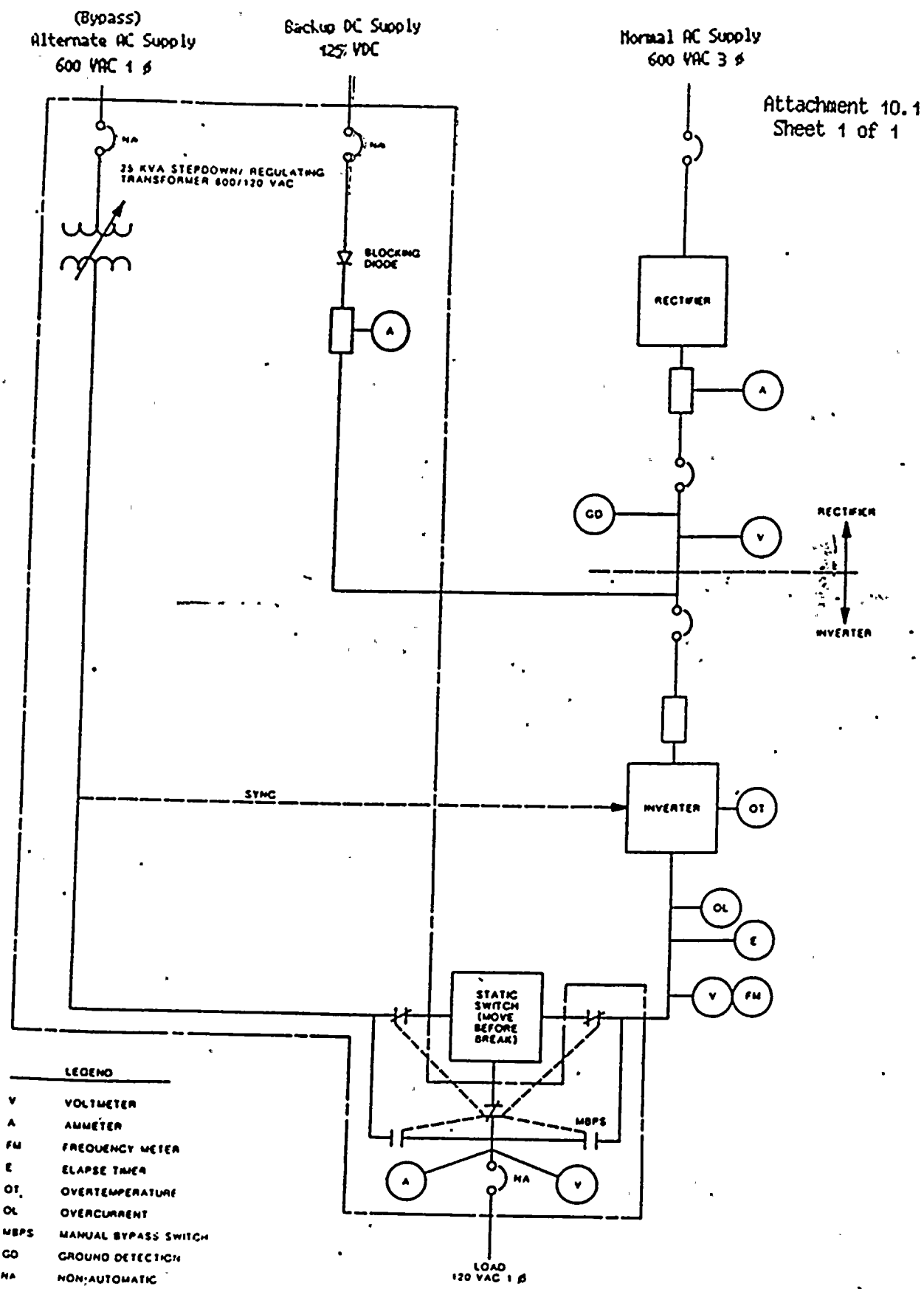
9.0 ACCEPTANCE CRITERIA

- 9.1 No corrective action required.

10.0 ATTACHMENTS

- 10.1 Single Phase Uninterruptible Power
- 10.2 Data Sheets





Equipment Piece No. _____

Attachment 10.2
Sheet 1 of 3

DATA SHEET

UPS INVERTER CLEANING AND INSPECTION
N2-EPM-GEN-RF635

Initials/Date

A. VERIFICATION OF PROCEDURE STEPS:

Prerequisites

6.1	Plant conditions satisfactory.	Maint.	_____ / _____
6.2	System conditions satisfactory.	Maint.	_____ / _____
6.3	SSS permission.	SSS	_____ / _____

PLANT IMPACT: THE EQUIPMENT MARKED UP WILL
NOT BE AVAILABLE FOR SERVICE.
THE UPS LOADS WILL BE FED FROM
ITS ALTERNATE AC SUPPLY.

6.4	Notified CSO.	CSO	_____ / _____
6.5	Mark-ups hung. No. _____	Maint.	_____ / _____
6.6	QA notified.	Maint.	_____ / _____
6.7	Personnel familiar with procedure.	Maint.	_____ / _____

7.0 Procedure

7.1	Inverter is de-energized.	Maint.	_____ / _____
7.2	Cleaned inside of inverter with non-metallic wand.	Maint.	_____ / _____
7.3	Cleaned or replaced air filters.	Maint.	_____ / _____
7.4	Inspected components for signs of overheating/discoloration.	Maint.	_____ / _____
7.5	Inspected internal wiring for discoloration/frayed insulation.	Maint.	_____ / _____
7.6	Checked internal wiring connections for tightness. Tightened as necessary.	Maint.	_____ / _____

Equipment Piece No. _____

Attachment 10.2
Sheet 2 of 3

DATA SHEET

UPS INVERTER CLEANING AND INSPECTION
N2-EPM-GEN-RF635

Initials/Date

A. VERIFICATION OF PROCEDURE STEPS: (Cont'd)

7.7 Checked large power wiring terminals Maint. /
connections for tightness. Tightened
as necessary.

8.0 Return to Normal

8.1 Mark-ups surrendered. Maint. /

8.2 Operations notified equipment is available Maint. /
for post-maintenance test.

9.0 Acceptance Criteria

9.1 No corrective action required.

Signature Table

	<u>INITIALS</u>	<u>SIGNATURE</u>	<u>PRINTED NAME</u>
Performed by:	_____	_____	_____
Performed by:	_____	_____	_____
Performed by:	_____	_____	_____
Performed by:	_____	_____	_____
Performed by:	_____	_____	_____

B. RESULTS:

1. () Acceptable
2. () Acceptable with comments. Work Request No. _____
3. () Unsatisfactory, (Use Remarks section as necessary and initiate a Work Request). Work Request No. _____

Equipment Piece No. _____

Attachment 10.2
Sheet 3 of 3

DATA SHEET

UPS INVERTER CLEANING AND INSPECTION
N2-EPM-GEN-RF635

C. REMARKS:

D. REVIEW:

_____/_____
Maintenance Man Date

_____/_____
Asst./Maintenance Supervisor Date

07-172-91

✓
P# 11642
10-21-90

W28
10/31/00

MASTER

NINE MILE POINT NUCLEAR STATION UNIT 2

ELECTRICAL PREVENTIVE MAINTENANCE PROCEDURE

PROCEDURE NO. N2-EPM-GEN-RF635

2

UPS INVERTER CLEANING AND INSPECTION

DATE AND INITIALS

APPROVALS

SIGNATURES

REVISION 1

REVISION 2

REVISION 3

Site Superintendent
Maintenance - Nuclear
K. A. Dahlberg

KA Dahlberg

[Handwritten signatures]

Station Superintendent
NMPNS Unit 2
R. B. Abbott

R B Abbott

General Superintendent
Nuclear Generation
J. L. Williams

[Handwritten signature]

W
7/21/88

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Summary of Pages

Revision 1 (Effective 7/21/88)

<u>Pages</u>	<u>Date</u>
5,8	July 1986
4,6,7	July 1988
*1-3	April 1990 (Publication Change)
Periodic Review, 4/2/90, No Change	

NIAGARA MOHAWK POWER CORPORATION

THIS PROCEDURE NOT TO BE
USED AFTER April 1992
SUBJECT TO PERIODIC REVIEW.

CONTROLLED WORKING COPY
VERIFIED BY Mme Conby
NOT TO BE USED AFTER 10-24-90 1600
DATE/TIME

CONTROLLED WORKING COPY
VERIFIED BY Steve Day
NOT TO BE USED AFTER 10-20-90 16:00
DATE/TIME

CONTROLLED WORKING COPY
VERIFIED BY John Higby
NOT TO BE USED AFTER 10-7-90 1600h
DATE/TIME

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UPS INVERTER CLEANING AND INSPECTION

1.0 PURPOSE

1.1 This procedure describes the steps necessary to perform cleaning and inspection of the Safety Related Uninterruptible Power Supply (UPS) Inverters.

1.2 Applicability

This procedure is applicable to the Safety Related UPS Inverters located as follows:

<u>EQUIPMENT</u>	<u>NORMAL POWER</u>	<u>ALTERNATE POWER</u>	<u>BACKUP POWER</u>
2VBA*UPS2A	2EJS*PNL100A-7	2LAC*PNL100A-19	2BYS*SWG002A-3C
2VBA*UPS2B	2EJS*PNL300B-7	2LAC*PNL300B-19	2BYS*SWG002B-3C

LOCATION - CBS, EL. 261'

1.3 Frequency

This procedure should normally be performed only when inverters are taken out of service, or a refueling outage.

1.4 Safety Classification

Safety Related

1.5 Safety Related Maintenance Requirements

1.5.1 The Safety Related UPS Inverters are qualified for a mild environment.

1.5.2 The safety-related maintenance requirements of EQMPOS-E035AAA Rev. 4 and E035AAB Rev. 4 are incorporated in this procedure, as applicable. *

2.0 REFERENCES

2.1 NMPC Accident Prevention Rules

2.2 AP-4.2 Control of Equipment Markups, Revision 04 *

2.3 Elgar Corp. Instruction Manual, DOCNO: UPS-253-1-106, Access No: 430002188, NMPC File Sequence No. N20349 *

- 2.4 EQMPS-E035AAA, E035AAB Revision 4
- 2.5 12177-EE-001CB, 001CC, 001CM, and 001CN One Line Drawings
- 2.6 O&MR - 169.
- 2.7 SIL-343

- 3.0 TECHNICAL SPECIFICATIONS
- 3.1 Section 3/4.8.3, Onsite Power Distribution
- 3.2 Section 3/4.8.2, DC Sources

- 4.0 MEASURING AND TEST EQUIPMENT, SPECIAL TOOLS, AND MATERIALS
- 4.1 M&TE
N/A
- 4.2 Special Tools
- 4.2.1 Vacuum cleaner with non-metallic wand and soft bristle brush attachment.
- 4.3 Materials
N/A
- 4.3.1 Air Filters

- 5.0 PRECAUTIONS AND LIMITATIONS
- 5.1 Prior to performing maintenance transfer the UPS to its alternate AC supply. If alternate AC supply circuit is energized entire alternate supply section in UPS is energized and output cables travel through inverter section of UPS.
- 5.2 Personnel shall comply with the requirements of NMPC Accident Prevention Rules.
- 5.3. If any reportable problems are determined while performing maintenance on the equipment, notify both the Assistant Maintenance Supervisor and SSS and determine if an Occurrence Report should be initiated.
- 5.4 Always wear rubber gloves when working with equipment that may possibly be energized.

5.5 Voltage is present at many points inside the inverter even after the AC and DC breakers have been opened.

5.6 Static can damage UPS circuitry. If wiping is done be cautious of small terminal connections and DO NOT wipe circuit cards. I.C. chips may be damaged.

6.0 PREREQUISITES

6.1 Plant Conditions - Outage

6.2 System Conditions - The inverter will be de-energized. The UPS will be fed from its alternate AC supply. If loose connections are found, UPS system including alternate supply must be de-energized in order to tighten.

6.3 Obtain permission from SSS to start work.

PLANT IMPACT: THE EQUIPMENT MARKED UP WILL NOT BE AVAILABLE FOR SERVICE. THE UPS LOADS WILL BE FED FROM ITS ALTERNATE AC SUPPLY.

6.4 Notify CSO of intent to perform maintenance.

6.5 Mark-Ups - Obtain mark-ups per AP-4.2 (equipment power supplies are listed in Section 1.2).

6.6 Notify QA an initial on data sheet.

6.7 Personnel performing this procedure have read it in its entirety and are thoroughly familiar with its contents.

7.0 PROCEDURE

WARNING:

VOLTAGE IS PRESENT AT MANY POINTS INSIDE THE INVERTER EVEN AFTER THE AC AND DC BREAKERS HAVE BEEN OPENED. METER CAN BE USED TO VERIFY AREAS INSIDE INVERTER THAT ARE ENERGIZED AND DE-ENERGIZED.

NOTE: Use caution when cleaning the inside of the inverters not to damage components.

7.1 Ensure the inverter is de-energized and marked up.

7.2 Using a non-metallic vacuum wand and a soft bristle brush attachment, thoroughly clean the inside of the inverter.

- 7.3 Clean or replace the air filters as necessary. (3 each per unit) | 1
- 7.4 Inspect the inverters internal components for signs of overheating or discoloration.
- 7.5 Inspect internal wiring for signs of discoloration or frayed insulation.
- 7.6 Check internal wiring for loose connections. Tighten as necessary.
- 7.7 Check large power wiring terminal connections for tightness. Tighten as necessary. Tightness can be verified by visually verifying that lockwashers (split lockwashers) are flat. | 1

8.0 RETURN TO NORMAL

- 8.1 Surrender mark-ups to operations.
- 8.2 Operations notified equipment is available for post-maintenance test. The following tests are recommended.
- 8.2.1 Establish equipment operation per applicable operating procedures.
- 8.2.2 Verify voltage, current, frequency, and temperature are normal.

9.0 ACCEPTANCE CRITERIA

- 9.1 No corrective action required.

10.0 ATTACHMENTS

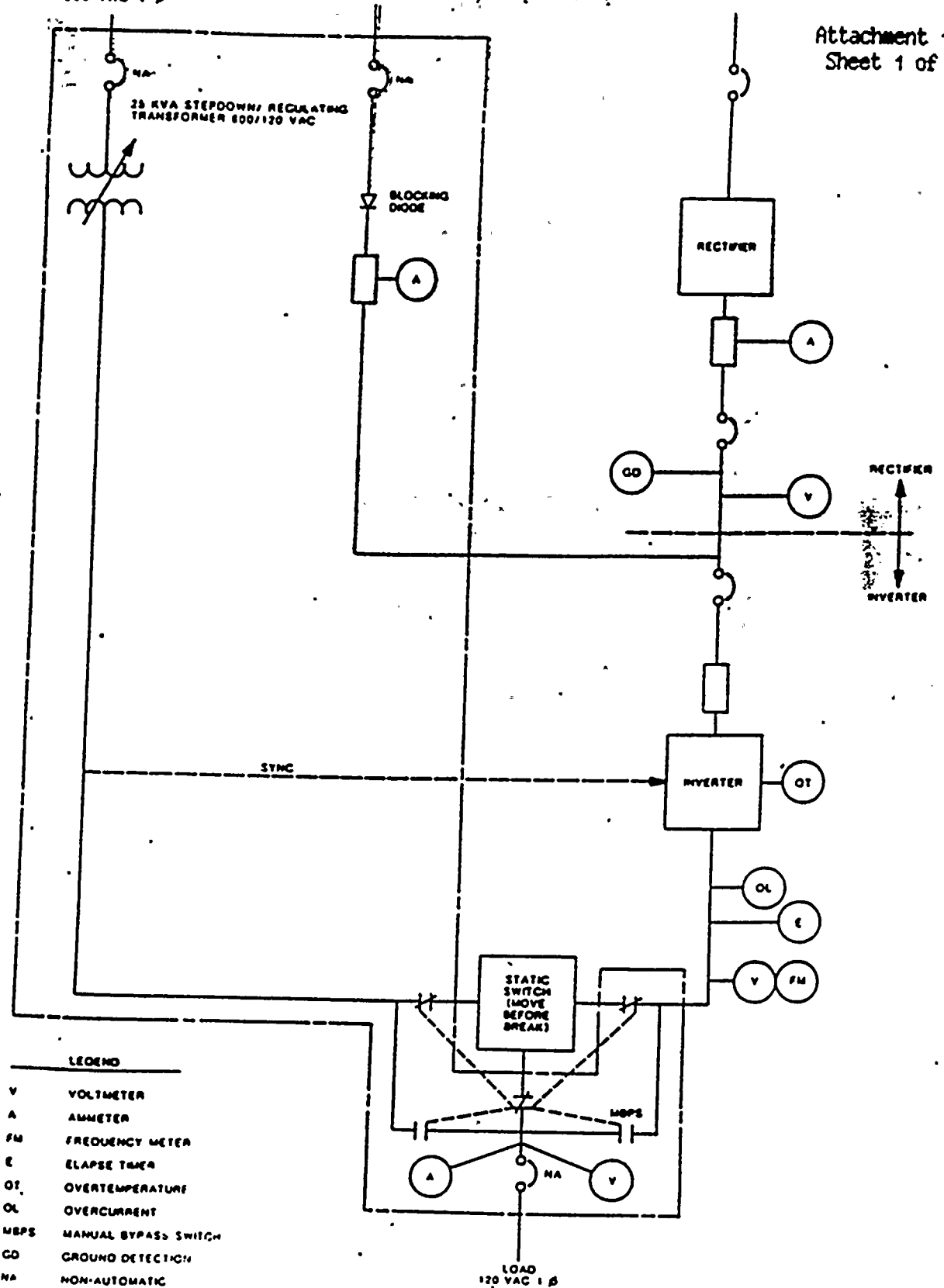
- 10.1 Single Phase Uninterruptible Power
- 10.2 Data Sheets

(Bypass)
Alternate AC Supply
600 VAC 1 ϕ

Backup DC Supply
125 VDC

Normal AC Supply
600 VAC 3 ϕ

Attachment 10.1
Sheet 1 of 1



Equipment Piece No. 2VBA * UPS2B

Attachment 10.2
Sheet 1 of 3

DATA SHEET

UPS INVERTER CLEANING AND INSPECTION
N2-EPM-GEN-RF635

Initials/Date

A. VERIFICATION OF PROCEDURE STEPS:

Prerequisites

- 6.1 Plant conditions satisfactory. Maint. SD 110-18-90
- 6.2 System conditions satisfactory. Maint. SD 110-18-90
- 6.3 SSS permission. SSS SD 110-20-90

PLANT IMPACT: THE EQUIPMENT MARKED UP WILL NOT BE AVAILABLE FOR SERVICE. THE UPS LOADS WILL BE FED FROM ITS ALTERNATE AC SUPPLY.

- 6.4 Notified CSO. *RED* 2-90-01592 CSO SD 110-20-90
- 6.5 Mark-ups hung. No. 01595 Maint. MDM 110-21-90
- 6.6 QA notified. Maint. MDM 110-21-90
- 6.7 Personnel familiar with procedure. Maint. MDM 110-21-90
- 7.0 Procedure
- 7.1 Inverter is de-energized. Maint. MDM 110-21-90
- 7.2 Cleaned inside of inverter with non-metallic wand. Maint. MDM 110-21-90
- 7.3 Cleaned or replaced air filters. Maint. MDM 110-21-90
- 7.4 Inspected components for signs of overheating/discoloration. Maint. MDM 110-21-90
- 7.5 Inspected internal wiring for discoloration/frayed insulation. Maint. MDM 110-21-90
- 7.6 Checked internal wiring connections for tightness. Tightened as necessary. Maint. MDM 110-21-90

Equipment Piece No. RVBA*WDS 28

Attachment 10.2
Sheet 2 of 3

DATA SHEET

UPS INVERTER CLEANING AND INSPECTION
N2-EPM-GEN-RF635

Initials/Date

A. VERIFICATION OF PROCEDURE STEPS: (Cont'd)

- 7.7 Checked large power wiring terminals connections for tightness. Tightened as necessary. Maint. MMM 10-21-90
- 8.0 Return to Normal
- 8.1 Mark-ups surrendered. Maint. MMM 10-29-90
- 8.2 Operations notified equipment is available for post-maintenance test. Maint. MMM 10-29-90
- 9.0 Acceptance Criteria
- 9.1 No corrective action required.

Signature Table

	<u>INITIALS</u>	<u>SIGNATURE</u>	<u>PRINTED NAME</u>
Performed by:	<u>mm</u>	<u>MMMcConkey</u>	<u>MMMcConkey</u>
Performed by:	_____	_____	_____
Performed by:	_____	_____	_____
Performed by:	_____	_____	_____

B. RESULTS:

- 1. Acceptable
- 2. Acceptable with comments. Work Request No. _____
- 3. Unsatisfactory, (Use Remarks section as necessary and initiate a Work Request). Work Request No. _____

Equipment Piece No. 2UBS*UPS 2B

Attachment 10.2
Sheet 3 of 3

DATA SHEET

UPS INVERTER CLEANING AND INSPECTION
N2-EPM-GEN-RF635

C. REMARKS:

D. REVIEW:

MM Cony 10-21-90
Maintenance Man Date
Frank Lopez 10/29/90
Asst./Maintenance Supervisor Date

POST MAINTENANCE TESTS

PMT REQUIRED EYES AND

TEST REQUIREMENTS

PROCEDURES

<input type="checkbox"/> No	<u>N2-GPM-GEN-REF 655</u>	<u>Step No. 1</u>	<u>SECT 9.2</u>	<u>EM</u>
<input type="checkbox"/> No		<u>Step No. 1</u>		<u>EM</u>
<input type="checkbox"/> No		<u>Step No. 1</u>		<u>EM</u>
<input type="checkbox"/> No		<u>Step No. 1</u>		<u>EM</u>

TESTS

Test	Acceptance Criteria
<input type="checkbox"/> Test _____	<input type="checkbox"/> _____
<input type="checkbox"/> Test _____	<input type="checkbox"/> _____
<input type="checkbox"/> Test _____	<input type="checkbox"/> _____
<input type="checkbox"/> Test _____	<input type="checkbox"/> _____

TEST RESULTS

Deferred	Sat	Performed By	Verified By
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	<u>MUM</u> <u>10-21-90</u>	<u>M. O. Smith</u> <u>10-21-90</u>
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	_____	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	_____	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	_____	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	_____	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	_____	_____
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sat	_____	_____

PLANNED AND TECHNICAL REVIEW

OPS ACCEPTANCE

Prepared by: J. Dickman Date: 8/26/90
 Technical Reviewer: Mark A. Bodeh Date: 10/26/90

Reviewed by: [Signature] ASSS/SSS Date: 10/20/90

Shaded section not used with WR/Document on WR.
 Remarks: _____

Note: The below signature, when signed, declares the equipment operable at the date and time specified.

Accepted by: [Signature] SSS Date: 10/29/90 Time: 1545