



**UNINTERRUPTIBLE POWER SYSTEMS  
ALL 3-PHASE MODELS  
SCOPE OF WORK**

**SYSTEM AVAILABILITY SERVICE (2)**

- Guaranteed 4-hour on-site response, 7 days/week, 24 hours/day, within 150 miles of a Liebert Global Services' Service Center.
- Includes 100% parts coverage (excluding batteries, air filters, and proactive full bank capacitor replacement.)
- Includes 100% labor and travel coverage 7 days/week, 24 hours/day, within the 48 contiguous states and Hawaii.
- Includes implementation of equipment firmware and software enhancements.
- Ensures system availability within 48 hours of Liebert Customer Engineer arriving at customer site.\*
- Includes one Semi-Annual and One Annual Preventive Maintenance Service scheduled by the customer at the customer's convenience (excluding national holidays).
- Performed by Liebert factory trained Customer Engineers.
- Includes 1-800-LIEBERT Customer Response Center.
- Includes access to Liebert Customer Services Network On-Line Internet portal.
- Subject to all Terms & Conditions as noted in the Liebert Maintenance Agreement.
- Refer to "Performance Metrics" addendum for Terms and Conditions in addition to Response Time Payment Schedule.

**SERVICE PERFORMED**

**UPS Full Preventive Maintenance Service**  
Semi-Annual Service

1. Perform a temperature check on all breakers, connections, and associated controls. Repair and/or report all high temperature areas.
2. Perform a complete visual inspection of the equipment including subassemblies, wiring harnesses, contacts, cables, and major components. Check air filters for cleanliness.
3. Check module(s) completely for the following (if applicable):
4. Rectifier and inverter snubber boards for discoloration.
5. Power capacitors for swelling and/or leaking oil.
6. DC capacitor vent caps that have extruded more than 1/8".
7. Record all voltage and current meter readings on the module control cabinet or the system control cabinet.
8. Measure and record harmonic trap filter currents.

Annual Service Includes the Above, Plus

9. Check the inverter and rectifier snubbers for burned or broken wires.
10. Check all nuts, bolts, screws, and connectors for tightness and heat discoloration.
11. Check fuses on the DC capacitor deck for continuity (if applicable).
12. With customer approval, perform operational test of the system including unit transfer and battery discharge.
13. Calibrate and record all electronics to system specifications.
14. Install or perform Engineering Field Change Notices (FCN) as necessary.
15. Measure and record all low-voltage power supply levels.
16. Measure and record phase-to-phase input voltage and currents.
17. Review system performance with customer to address any questions and to schedule any repairs.

**NOTE 1: Preventive Maintenance usually requires a shut-down to ensure electrical connection integrity.**

**NOTE 2: Customer should check air filters monthly for cleanliness and replace as necessary.**

**NOTE 3: Above maintenance does not include System Control Cabinet, Power Tie, Breaker Cabinets, Load Bus Sync or Maintenance Bypass Cabinets.**



**Battery Inspection Service - Performed During the UPS Semi-Annual and Annual PM Services**

1. Check integrity of battery cabinet (if applicable).
2. Visual inspection of the battery cabinet and/or room to include:
  - Check for NO-OX grease or oil on all connections (if applicable).
  - Check battery jars for proper liquid level (if flooded cells).
  - Check for corrosion on all the terminals and cables.
  - Examine the physical cleanliness of the battery room and jars.
3. Measure and record DC bus ripple voltage (if applicable).
4. Measure and record total battery float voltage.

**NOTE:** *The Battery Inspection Service listed above is only a visual inspection and is not intended to replace a full preventive maintenance program for the battery system.*

Attachment: Proc 5.1.1 (Rev 03/02)

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## Scope of Work System Availability Service Exhibit A

A. **System Availability.** If Liebert does not meet its system availability goal of forty-eight (48) hours or less for a specific Customer unit, Liebert shall pay to the Customer a percentage of the amount paid by Customer that year for the service provided for that Customer unit according to the scheduled below (the "**System Availability Reimbursement**"). The System Availability Reimbursement is limited to a percentage of the actual amount paid by Customer for the specific Customer unit that was unavailable for a period longer than forty-eight (48) hours and excludes "Major Magnetic" components that support the operation of the UPS. Major Magnetic components include:

1. Input Transformers;
2. Output Transformers;
3. Input Series Inductors;
4. Output Series Inductors; and
5. DC Chokes

System Availability Reimbursement			
Delay (Minutes)			Refund Percent
1	-	30	8.3%
31	-	60	16.7%
61	-	90	25.0%
91	-	120	33.3%
121	-	150	41.7%
151	-	180	50.0%

B. The System Availability reimbursement are fees (and not penalties) and are acknowledged by the parties as being a reasonable amount, fair consideration and a reasonably equivalent value for not meeting the on-site response time and system availability goals under this service program.





## SEALED VRLA BATTERIES SCOPE OF WORK

### ESSENTIAL SERVICE (2)

- Guaranteed 4-hour on-site response, 7 days/week, 24 hours/day, within 150 miles of a Liebert Global Services' Service Center.
- Includes parts, labor and battery jars as required - up to 10% of the battery string per year (not accumulated over contract term).
- Includes battery recycling as required, with documentation meeting EPA requirements.
- Includes 100% corrective labor and travel coverage 7 days/week, 24 hours/day, within the 48 contiguous states and Hawaii. Does not include labor for full-string replacement.
- Includes 1-800-LIEBERT Customer Response Center.
- Preventive Maintenance Service scheduled by the customer between 8am-5pm, Monday-Friday (excluding national holidays).
- For 3-Phase UPS customers, includes one Semi-Annual and one Annual PM.
- Performed by Liebert factory trained Battery Specialist or Customer Engineers.
- Subject to all Terms & Conditions as noted in the Liebert Maintenance Agreement.

### SCHEDULED MAINTENANCE PERFORMED

#### Semi-Annual Service

1. Inspect the appearance and cleanliness of the battery and the battery room. Clean normal cell top dirt accumulation (to be done only with battery off line).
2. Measure and record the total battery float voltage and charging current.
3. Visually inspect the jars and covers for cracks and leakage.
4. Visually inspect for evidence of corrosion.
5. Measure and record the ambient temperature.
6. Verify the condition of the ventilation equipment, if applicable.
7. Verify the integrity of the battery rack/cabinet.
8. Randomly measure and record 10% cell temperatures.
9. Measure and record the float voltage of all cells.
10. Measure and record all internal impedance readings.
11. Provide a detailed written report noting any deficiencies and corrective action needed, taken and/or planned.
12. Verify approval for Battery Life program.

#### Annual Service Includes the Above, Plus

13. Re-tighten all battery connections to the battery manufacturer's specifications.
14. Measure and record all battery connection resistances in micro-ohms, when applicable.

#### Corrective Maintenance Performed as Required

- *Refurbish cell connections as deemed necessary by the detailed inspection report.*





**POWER CONDITIONING AND DISTRIBUTION SYSTEMS  
ALL MODELS  
SCOPE OF WORK**

**PM ONLY 8X5 SERVICE (1)**

- Performed by Liebert factory trained Customer Engineers.
- Includes one Annual Preventive Maintenance Service scheduled by the customer between 8am-5pm, Monday-Friday (excluding national holidays).
- Subject to all Terms & Conditions as noted in the Liebert Maintenance Agreement.

**SERVICE PERFORMED**

**Full Preventive Maintenance Service**

1. Perform a complete visual inspection of the internal sub-assemblies, wiring harnesses, contactors, cables, major components, and check for proper clearance around the unit.
2. Inspect all transformer, terminal block, and ground/neutral bus bar connections for tightness.
3. Inspect input and output breaker(s) for tightness.
4. Inspect high and low voltage junction box terminals for tightness.
5. Inspect all option wiring for tightness. (Spike suppressor, ground fault, phase rotation/loss).
6. Inspect all capacitor bank connections for tightness.
7. Verify that all cooling fans are functional and air ducts are open.
8. Verify continuity of all fuses and that they are correctly rated.
9. Measure input and output phase to phase voltage.
10. Measure the output, neutral, and ground current.
11. Verify KVA load and capacity per phase.
12. Verify grounding electrode conductor and any isolated grounds.
13. Measure filter capacitor currents at no load for all three phases (if applicable).
14. Measure primary, secondary, 2nd harmonic, and 3rd harmonic (if applicable). All should be balanced within 2.5% deviation.
15. Verify EPO lamps are illuminated.
16. Check that the local and remote EPO's are functioning properly (if permitted).
17. Verify that the monitor is recording within +/- 2% of those values measured.
18. Activate the transformer over-temp alarm and shutdown circuits to confirm proper operation (if permitted).
19. Verify the operation of any option for alarm or shutdown sequence (if permitted).
20. Verify the operation of any customer alarm circuit(s) and specified messages.
21. Verify specified restart capabilities (manual or auto-restart).
22. Verify the operation of the bypass switch and the bypass transformer over temp alarm (if applicable).

**NOTE: Preventive Maintenance usually requires a shut-down to ensure electrical connection integrity.**





**UNINTERRUPTIBLE POWER SYSTEMS  
ALL 3-PHASE MODELS  
SCOPE OF WORK**

**PM ONLY SERVICE 8X5**

- Performed by Liebert factory trained Customer Engineers.
- Includes two Preventive Maintenance Service visits scheduled by the customer between 8am-5pm, Monday-Friday (excluding national holidays).
- Subject to all Terms & Conditions as noted in the Liebert Maintenance Agreement.

**SERVICE PERFORMED**

**UPS Full Preventive Maintenance Service**

1. Perform a temperature check on all breakers, connections, and associated controls. Repair and/or report all high temperature areas.
2. Perform a complete visual inspection of the equipment including subassemblies, wiring harnesses, contacts, cables, and major components. Check air filters for cleanliness.
3. Check module(s) completely for the following (if applicable):
4. Rectifier and inverter snubber boards for discoloration.
5. Power capacitors for swelling or leaking oil.
6. DC capacitor vent caps that have extruded more than 1/8".
7. Record all voltage and current meter readings on the module control cabinet or the system control cabinet.
8. Measure and record harmonic trap filter currents.
9. Check the inverter and rectifier snubbers for burned or broken wires.
10. Check all nuts, bolts, screws, and connectors for tightness and heat discoloration.
11. Check fuses on the DC capacitor deck for continuity (if applicable).
12. With customer approval, perform operational test of the system including unit transfer and battery discharge.
13. Calibrate and record all electronics to system specifications.
14. Install or perform Engineering Field Change Notices (FCN) as necessary.
15. Measure and record all low-voltage power supply levels.
16. Measure and record phase-to-phase input voltage and currents.
17. Review system performance with customer to address any questions and to schedule any repairs.

**NOTE 1: Preventive Maintenance usually requires a shut-down to ensure electrical connection integrity.**

**NOTE 2: Customer should check air filters monthly for cleanliness and replace as necessary.**

**NOTE 3: Above maintenance does not include System Control Cabinet, Power Tie, Breaker Cabinets, Load Bus Sync or Maintenance Bypass Cabinets.**

**NOTE 4: Does not include parts or return corrective visits.**

**Battery Inspection Service - Performed During the UPS Semi-Annual and Annual PM Services**

1. Check integrity of battery cabinet (if applicable).
2. Visual inspection of the battery cabinet and/or room to include:
  - Check for NO-OX grease or oil on all connections (if applicable).
  - Check battery jars for proper liquid level (if flooded cells).
  - Check for corrosion on all the terminals and cables.
  - Examine the physical cleanliness of the battery room and jars.
3. Measure and record DC bus ripple voltage (if applicable).
4. Measure and record total battery float voltage.

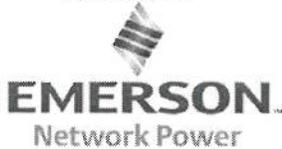
**NOTE: The Battery Inspection Service listed above is only a visual inspection and is not intended to replace a full preventive maintenance program for the battery system. Refer to Preferred, Essential**

Attachment #5  
Vendor Contract #2522  
800-543-2378

**or Basic services (for Battery Systems) for full service programs with scheduled Preventive Maintenance.**

Attachment: Proc 5.1.1 (Rev 03/02)

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## UNINTERRUPTIBLE POWER SYSTEMS PERIPHERALS

MAINTENANCE BYPASS CABINET  
LOAD BUS SYNC  
POWER TIE  
SYSTEM CONTROL CABINET  
SLIM LINE DISTRIBUTION CABINET

### SCOPE OF WORK

#### EMERGENCY RESPONSE SERVICE

- Guaranteed 4-hour on-site response, 7 days/week, 24 hours/day within 50 miles of a Liebert Services' Service Center.
- Includes 100% parts (excluding circuit breakers) coverage.
- Includes 100% labor and travel coverage 7 days/week, 24 hours/day, within the 48 contiguous states and Hawaii.
- Performed by Liebert factory trained Customer Engineers.
- Includes one Performance Evaluation inspection - performed immediately after the completion of an emergency visit.
- Includes 1-800-LIEBERT Customer Response Center.
- Includes access to Liebert Customer Services Network On-Line Internet portal.
- Subject to all Terms & Conditions as noted in the Liebert Maintenance Agreement.

#### SERVICE PERFORMED

#### Performance Evaluation (performed only after an emergency service visit)

1. Complete visual inspection of the equipment including internal sub-assemblies, wiring harnesses, contactors, cables, and major components.
2. Visually check all mechanical connections for tightness and heat discoloration, making corrections where necessary.
3. Perform a status check of all alarm circuits.
4. Perform a basic operational test of the system.
5. Review system performance with customer to address any system questions.

**Note 1: Preventive Maintenance usually requires a shut-down to ensure electrical connection integrity.**

**Note 2: Service does not include maintenance on the circuit breaker in System Control Cabinet.**

