

Commissioning Guide

For a

New UPS System

This document is a detailed guide for Commissioning of a new Uninterruptible Power Supply system (UPS). The commissioning is best performed by an independent, third party, commissioning agent (CA) that is not employed by either the equipment vendor or the installer. The equipment vendor's service technician is expected to be part of the testing procedures, and the installer should be on site to correct any installation issues should any arise.

1. Pre-installation

1.1. Client should schedule a pre-installation meeting between consultant engineer, vendor, installer, and commissioning agent (CA) to review equipment details, installation and startup plans, and commissioning.

1.2. CA will review vendor

1.3. Vendor's startup guide as purchased by client and make any recommendations.

2. Installation Inspection

2.1. CA will perform one or more site visits during equipment installation to inspect progress and provide any comments to client as appropriate concerning general nature of equipment and installation.

2.2. Client's consulting engineer is responsible for any electrical code requirements and any potential issues.

3. Vendor Startup of New UPS

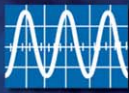
3.1. CA will observe vendor's startup and review technician's FSR upon completion.

4. Commissioning

4.1. The commission procedure may be incorporated into the vendor's startup procedure, but activity will be supervised by CA.

4.2. Either at time of and part of initial startup or as separate procedure following vendor startup, the SOW of final commissioning is as follows:

4.2.1. Observe and review vendor's startup procedure



- 4.2.2. Instruct installer to connect load banks of the size as previously decided by client (Load banks to be furnished by installer, CA, or installer as previously decided).**
- 4.2.3. Follow detailed SOW to insure all power is off at all connection points prior to load bank hookup.**
- 4.2.4. With UPS running, put load on UPS via load bank in steps and observe UPS performance as load is increased to planned maximum.**
- 4.2.5. Perform following tests as detailed in commissioning SOW:**
 - 4.2.5.1. Check all UPS input and output voltage and currents for accuracy with vendor's calibrated instrument.**
 - 4.2.5.2. With battery fully charged, perform a battery run down test for the designed run time to verify battery performance.**
 - 4.2.5.2.1. Battery should initially provide run time as purchased at 80% of designed load and will improve performance over time after startup.**
 - 4.2.5.2.2. Take DC Tests of battery amperage and voltage measurements every one minute to establish an initial performance curve.**
 - 4.2.5.2.3. Perform IR scan on battery to detect heat and any possible hot spots.**
 - 4.2.5.3. Vendor's startup procedure should include the following at minimum**
 - 4.2.5.3.1. Tests of alarm functions**
 - 4.2.5.3.2. Operation of transfers between by[pass and inverter**
 - 4.2.5.3.3. IR scan of UPS components during full load operation**
 - 4.2.5.3.4. Condition of room environment at UPS location**
 - 4.2.5.3.5. Check of UPS and battery input current limits if applicable**
 - 4.2.5.3.6. Efficiency measurement of UPS with battery fully charged (or disconnected)**
- 4.2.6. Inspect UPS room for proper cleanliness and removal of installation materials by installer.**
- 4.3. Provide final report to client noting any issues and recommendations.**