



**SOFTWARE: AUXILIARY POWER SUPPLY; UPGRADE; DEVELOPMENT, TESTING,
DELIVERY, AND SUPPORT**

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1. SCOPE

- 1.1 This specification will describe the requirements for the development, testing, delivery, of a complete and fully operational software update for the Auxiliary Power Supply (APS) on the Chicago Transit Authority's (CTA's) 5000 Series Railcars.

2. GENERAL INFORMATION

2.1 ACRONYMS

- 2.1.1 APS: Auxiliary Power Supply
- 2.1.2 CTA: Chicago Transit Authority
- 2.1.3 OEM: Original Equipment Manufacturer
- 2.1.4 PTE: Portable Test Equipment
- 2.1.5 PTU: Portable Test Unit

2.2 APPLICABLE INFORMATION

- 2.2.1 The version of a standard, code, statute, or guideline referenced herein that is current on the date of release applies.
- 2.2.2 Sub-sections that are "Not Applicable" to this specification are indicated with "N/A."
- 2.2.3 The Contract Document will provide information for contacting the appropriate CTA contact personnel.

3. DELIVERABLES

3.1 PRE-AWARD

- 3.1.1 The potential Contractor must provide the following items with its bid or within five (5) business days of CTA's request:
 - a. Documentation: Contractor's experience developing, testing, delivering, Turbo Power Systems software detailed in this specification (see paragraph 4.2.1).



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3.2 POST-AWARD

3.2.1 The Contractor must provide the following items after award of Contract or within five (5) business days of CTA’s request:

- a. Software Development Plan and Schedule (see paragraph 4.2.2)
- b. Testing Plan (see section 4.4)
- c. Safety Process Plan (see section 4.5)

4. CHICAGO TRANSIT AUTHORITY CONTRACT REQUIREMENTS

4.1 CONTRACTOR REQUIREMENTS

4.1.1 The Contractor must be a professional business entity with at least five (5) years’ experience developing, testing, delivering, Turbo Power Systems software. The CTA requires documentation meeting the requirements of this specification with the bid response package, or within five (5) business days of the CTA request.

4.1.2 Software Development Plan and Schedule: The Contractor must submit a software development plan and schedule for review and approval by the CTA four (4) weeks following contract award. This plan must include submittals, check points, testing, deliveries, meeting dates, etc. The plan must identify key personnel, resources, and subcontractors, etc.

4.1.3 The Contractor must be an authorized distributor of Turbo Power Systems, software products.

4.2 DETAILED REQUIREMENTS

4.2.1 The complete Auxiliary Power Supply software update must include the following features or characteristics:

4.2.1.1 Change the railcar battery overtemperature fault trip (currently code 4023) to a 30 seconds delay with immediate lockout, causing the “White Light” fault (currently code 4021).

4.2.1.2 Change the battery temperature sensor short/open circuit (codes 4051/2) detection to 30 seconds delay with immediate lockout, causing the “White Light” fault.



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4.2.1.3 Fix the logic issue with the way the short/open battery temperature sensor circuit trip feeds into the overtemperature trip, to ensure that the overtemperature trip is operating as much of the time as possible as long as the thermistor is not (even temporarily) detected as being faulty.

4.2.1.4 Modify Battery Charging software to reduce the number of nuisance Battery Charge overcurrent faults (code 4083).

4.2.2 The Portable Test Unit (PTU) diagnostics software new version needs to be developed to have the following changes from version currently used by CTA:

4.2.2.1 Allow access to Test Mode without needing a password

4.2.2.2 Change the default event file naming system to insert rail car number into suggested filenames.

4.2.2.3 Make sure that modified Portable Test Equipment (PTE) software will work properly in CTA Bench Test Equipment.

4.2.3 In addition to updating the parameters listed above, the following activities must also be performed:

4.2.3.1 Perform lab testing to verify that the software update functions as intended, and no unintended failures were introduced into the software revision.

4.2.3.2 Perform all necessary software development tasks required to make the software parameter changes.

4.2.3.3 Update all software documents, including detailed software installation instructions, and deliver these updated documents to the CTA. This must include Bench Test Equipment instructions where applicable.

4.2.3.4 Perform regression testing to ensure that the updated Auxiliary Power Supply software still performs correctly.

4.3 PERFORMANCE REQUIREMENTS

4.3.1 Testing Plan: The Contractor must instruct CTA on how to properly test the updated functionality of Battery Charging.

4.3.1.1 Contractor needs to be ready to review event logs that will be retrieved from modified Auxiliary Power Supplies during test period, up to 90 days.



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- 4.3.1.2 The Contractor must perform a complete demonstration of all design and functional features of the software changes.
- 4.3.1.3 Any applicable test must be repeated if the software fails to pass a given test.

4.4 SAFETY REQUIREMENTS

4.4.1 Where applicable, the Contractor must submit any Safety Process Plans detailing safety requirements when performing the software update and during updated PTU software use.

4.4.2 For more information regarding safety information for work nearby to CTA Infrastructure, please refer to the following links:

4.4.2.1 Overview: <https://www.transitchicago.com/nearbyconstruction/>

4.4.2.2 Technical Requirements for Contractors working adjacent to CTA infrastructure:
https://www.transitchicago.com/assets/1/6/Adjacent_Construction_Manual_March_2022.pdf

4.4.2.3 CTA Right-of-Way Requirements Document:
https://www.transitchicago.com/assets/1/6/Right_of_Way_Requirements-Revised_10082013a_REV_E_10-20-14_FINAL.pdf

4.5 WARRANTY INFORMATION

4.5.1 The software must carry a manufacturer guarantee to be free from flaws (“bugs”) for the standard warranty period of no less than 1 year.

4.5.2 The Contractor agrees to promptly correct any issues found due to failure of the software to properly function as required by this contract or due to the introduction of unintended software “bugs” that may develop within the standard warranty period. Additionally, if such “bugs” cause subsequent damage to any hardware components, those components must be replaced with new components at no charge to the CTA. The Contractor will be given the opportunity to determine if the fault is due to the software or another determining factor causing the damage.

4.5.3 Contractor must provide appropriate support contact telephone numbers to the CTA Manager or designee.



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4.5.4 Support will be provided via telephone, Internet based Web site and Email response to questions and error messages

4.6 ADDITIONAL INFORMATION FOR POTENTIAL CONTRACTORS

4.6.1 Potential Contractors requiring any additional information must contact the CTA Procurement Administrator or Buyer listed in the Contract Documents. Potential Contractors requiring additional information from a person or persons potentially listed in the Special Conditions section of the Contract Documents must route their request through the Procurement Administrator or Buyer. Potential Contractors who contact any CTA personnel other than the Procurement Administrator or Buyer during the open bidding period will be in violation of the provisions set forth in the Contract Documents.

DISTRIBUTION LIST:

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REVIEWER / Writer(s):

KK, BB/bb – Initial Specification – 03/21/25