GUAM POWER AUTHORITY

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Transmission and Distribution Specification

Specification No. E-056

OMNI-RUPTER SWITCH RETROFIT KIT FOR 13.8kV OVERHEAD DISTRIBUTION

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1.0 SCOPE:

This specification covers Guam Power Authority's requirement for an Omni-Rupter Switch Retrofit Kit for the Overhead Distribution System at 13.8kV.

2.0 SERVICE CONDITIONS AND OPERATION:

2.1 The Omni-Rupter Switch Retrofit Kit is intended for use in an average ambient temperature of 21-32 deg. C (70-90 deg. F), corrosive salt air environment, sustained wind strengths of 170 MPH, and subject to seismic zone 4 conditions.

3.0 CONFORMANCE TO SPECIFICATION REQUIREMENTS:

3.1 Applicable Standards

Operating mechanisms and switch hooks or stick shall conform to Clause 10 of ANSI C37.32-2002. Certified Factory Test Reports shall be provided in accordance with Section 6.

3.2 Deviations and Non - Conformance Requirements

3.2.1 Deviations from this specification or changes in the material or design after the purchase order has been placed must be approved by the GPA Engineering Department and acknowledged by a Purchase Order Agreement issued by Guam Power Authority.

3.2.2 Units received with deviations or non – conformances that are not acknowledged as specified in Section 3.2.1, are subject to rejection. The Supplier of rejected units is responsible for any corrective action including but not limited to materials, labor and transportation necessary to dispose of, or make the units conform to this specification.

3.2.3 Notification of defects discovered before or after installation that are believed to be inherent to manufacturing problems or workmanship shall be made and forwarded to the Supplier. The description of the item, documentation of the problem and the described information, disposition and/or follow-up (as appropriate) that Guam Power Authority expects from the Supplier will be specified. The Supplier's response shall be made within thirty (30) days unless an extension is acknowledged and approved in writing by the GPA Manager of Engineering.

4.0 GENERAL:

4.1 Conversion / Retrofit Kit for existing units shall be furnished with the following parts and accessories.

Item No.	Description	Part No.	Quantity
1	Switch base close position label	SD-6986	1 each
2	Pipe Coupling assembly	SDA-4880	3 each
3	Rotating toggle linkage operating assembly	SDA-5692	1 each
4	Universal Coupling	SDA-10095	1 each
5	1-1/2 IPS upper pipe 2083mm	S-90575-C100	3 each
6	Splice coupling assembly	SDA-5426	1 each
7	Guide bearing assembly	SDA-2568	3 each
8	Coupling Assembly - 1	SA-43784	1 each
9	Coupling Assembly - 2	SA-43785	1 each
10	PIN	S-55844-7	1 each
11	1/2-13x2-3/4 Hex Head Cap Screw Bolt Galv. Grade 5	1023-341	3 each
12	1/2-13 uni-torque nut 8	1040-035	3 each
13	1/2 FW 1-1/16X17/32X.097/.177 RC38/45 GA	1040-039	8 each
14	1/8x1" Cotter Pin Stainless Steel	1340-228	1 each
15	TLS-35 Anderson Lug	3022-029	1 each
16	GG-17-1 Burndy ground Connector	3022-171	1 each
17	1/2-Diameter lag screw x 5" LG. Galvanized	1023-043	6 each
18	Ground Strip	SA-30996	1 each
19	Battery Replacement Kit	SDA-10911	1 each
20	Automatic Switch Operator (preferably, S&C **6801M-20-H1JB2L71M0P0Y1** or the most recent model).		1 each

4.2 Automatic Switch Operator shall have the following specifications:

4.2.1 Rotating-Drive Operator Performance:

a. Control rod rotation speed: 90° in 0.5 sec
b. Control rod travel range: 0 to 180°
c. Accuracy: ±2.0°

4.2.2 Travel Limit:
- a. Microprocessor-controlled, two step

4.2.3 Motor:
- a. 3.6-HP dc

4.2.4 Control Power:
- a. 90 to 264 Vac or 100 to 370 Vac, 50/60 Hz

4.2.5 Environmental Operating Characteristics:
- a. Temperature: 20-32 deg. C (70-90 deg. F)
- b. Humidity: 0 to 95% (noncondensing)
- c. Microprocessor-controlled heater to minimize condensation

4.2.6 Voltage and Current Sensing Option:
- a. True RMS voltage and current sensing
- b. Voltage accuracy: ±0.5% full scale over temperature range; resolution: 0.1 Vac.
- c. Current sensor input range: 0 to 900 A RMS
- d. Current accuracy: ±0.5% full scale over temperature range; resolution: 1 A RMS.
- e. Phase angle range: 0 to 360°
- f. Phase angle accuracy: ±1° at 5% of full-scale current; resolution: ⅛°
- g. Overcurrent fault-detection range: 0 to 4000 A RMS
- h. Overcurrent fault-detection accuracy: ±0.5% full scale

4.2.7 Radio Faulted-Circuit Indicator Option:
- a. Performance in accordance with sensor manufacturer's specifications.

4.2.8 Communication Ports:
- a. Two (2) Ethernet
- b. Two (2) SCADA RS232 connectors, 1,200 to 57,600 baud
- c. One (1) USB/DB9 configuration port

4.2.9 Protocol:
- a. DNP 3.0 Level 2

4.2.10 Power Supply/Battery Charger:
- a. Supports communication equipment
- b. Provides automatic, remote, and local battery testing
- c. Charger: 50 W, regulated 24 Vdc
- d. Battery: 33 amp-hour, sealed lead-acid

e. Expected battery carryover: 16 hours; varies with battery type, age, ambient temperature, communication device, and number of switch/ disconnect operation

4.2.11 Enclosure Options:
- a. Mounting: Pole mounting
- b. Material: Padlockable, corrosion-resistant stainless steel enclosure
- c. Dimensions: 24-inch W×24-inch H ×15 5/16-inch D
- d. Weight: 175 lbs. (79 kg), less battery

4.2.11 Other Options:
- a. Software: Standard
- b. Connector: No connectors (standard with no sensor inputs)
- c. Universal joint for retrofitting: For 1 1/2-inch IPS vertical operating pipe

4.2.12 All equipment must be compatible with the existing S&C Omni-Rupter Switch **Model No. 147422R4-H-C500.**

5.0 Installation, Operation and Maintenance Manuals

5.1 The Supplier shall provide Guam Power Authority with three (3) sets of hardcopies and one (1) soft file in pdf format of full Installation, Operating and Maintenance Manuals for each unit, at least three (3) weeks prior to delivery.

5.2 One (1) additional Installation, Operation and Maintenance Manual shall be placed with each unit within the Automatic Switch Operator enclosure.

6.0 TESTING:

6.1 The Supplier shall supply two (2) hardcopies and one (1) soft file in pdf format of the certified test reports.

6.2 When installed as part of a new overhead 13.8 kV distribution line, the Automatic Switch Operator shall be included in the Factory Acceptance Test (FAT). Functional and operational tests in the field may be included in the tests.

7.0 SHIPPING REQUIREMENTS:

7.1 The Supplier shall have sufficient work and inspections for handling, temporary storage, preservation, packaging, and shipping to protect the quality of this equipment and its accessories as well as to prevent damage, loss, deterioration and substitution of products.

7.2 The Supplier shall prepare all materials and equipment for shipment in such a manner as to protect from damage in transit. All small parts and unit components shall be separately boxed or bundled to prevent galling due to rubbing of one part against another. Each item, box or bundle shall be plainly and individually identifiable for content according to item number, GPA P.O. Number, and Supplier's Identifying Number.

7.3 A complete itemized Bill of Lading, which clearly identifies and inventories each assembly, sub-assembly, carton, package, envelope, etc., shall be furnished and enclosed with each item or items at the time of shipment.

7.4 For crating or packing, The Supplier shall use hardwood or wood products that have been certified by the wood manufacturer to have been kiln dried to a core temperature of 133°F (56°C) for at least 30 minutes.

7.5 Delivery shall be to actual jobsite as identified by the Guam Power Authority Manager of Engineering.

8.0 STATEMENT OF COMPLIANCE:

The Supplier shall provide a signed statement verifying that the products being supplied fully comply with the specification stated herewith. Items not in full compliance with this specification will be identified with a description of the deficiency and any proposed substitutions must be approved by the Guam Power Authority Engineering Department, as described in Section 3.2.1.

9.0 WARRANTY:

The Supplier shall warrant the satisfactory and successful operation of the equipment furnished under this specification at the rating, under the conditions, and for the service specified. The Supplier shall further warrant this equipment against defects of design, material and workmanship. All workmanship and parts shall have a warranty of at least (1) year from the date of equipment's commissioning