1.2 SYSTEM DESCRIPTION

Complete Aircraft wash system designed to provide Two(2) remote operating stations; each remote station shall have a naturally aspirated foaming system, variable pressure hot water wash system, and high volume water cannon rinse system. System shall have ability to operate any single function or all functions at the same time at multiple stations if required. Each remote station shall operate independent of other station.

All equipment shall have ETL, CSA and CE certifications manufactured and supplied by an ISO Registered Manufacturer (certifications to be provided on request). Manufacturing and supply of all equipment shall therefore be in accordance with established ISO Standards.

1.2.1 Foaming System:

Naturally aspirated foaming system shall have cleaning compound solution flow of 7.6-lpm (2-gpm) with backpressure variation from 1,379-kpa (200-psi) up to 5.5-Mpa (800-psi).

2.2.2 Wash System:

Hot water wash system shall have water flow of 19-lpm (5-gpm) and be supplied to operate at a backpressure of 1,207-kpa (175-psi). Wash system shall have capability of backpressure adjustment up to maximum 20.7-Mpa (3,000-psi).

1.2.3 Rinse System:

High volume rinse system water cannon shall have capability to dispense 115-lpm (30-gpm) at 1,207-kpa (175-psi).

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Aircraft Wash System; G

Detail drawings consisting of instructions, diagrams, and other information to illustrate the requirements and operations of the entire system. Detail drawings of components, piping layouts and locations of connections with dimensions for rough in. Schematic diagrams with wiring diagrams or connections and interconnection diagrams shall be included.

Provide mechanical drawing plans with elevations to show details and clearance requirements. Drawings shall include sufficient detail for installation by the on-site contractors.

SD-03 Product Data

Foaming System Equipment; G
Wash System Equipment; G
Rinse System Equipment; G

Remote Equipment Module (REM) Stands; G
NEMA 4X Control Panels; G
Foaming System Piping; G
Wash System Piping; G
Rinse System Piping; G

SD-06 Test Reports

Inspection

Pre-Operational Test

Onsite testing including photos and spread sheets showing all flow and pressures. Submit results of all testing to approving authority.

SD-08 Manufacturer's Instruction

Aircraft Wash System; G

Provide necessary operation and maintenance manuals.

SD-10 Operation and Maintenance Data

Aircraft Wash System; G

Submit in accordance with manufactures standards

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery and Storage

Inspect materials delivered to site for damage; unload and store with minimum handling. Store material on-site in enclosures or under protective coverings. Protect materials not suitable for outdoor storage to prevent damage during periods of inclement weather, such as subfreezing temperatures, precipitation, and high winds. Store materials susceptible to deterioration by direct sunlight under cover and avoid damage due to high temperatures. Do not store materials directly on ground. If special precautions are required, prominently and legibly stencil instructions for such precautions on outside of equipment or its crating.

1.4.2 Handling

Handle equipment in such a manner as to ensure delivery to final location in sound, undamaged condition. Take special care not to damage interior and exterior surfaces. Make satisfactory repairs to damaged materials at no cost to Government. Carry and do not drag materials.

1.5 WARRANTY

Equipment shall include a 1-year equipment warranty from manufacturer in accordance with standard RGA procedure. In compliance with manufacturers OEM supplied parts, Contractor shall provide quarter preventative maintenance visits for 3-years from date of commissioning. Preventive maintenance shall include all parts, hoses, oil, belts, wands, and nozzles.

PART 2 PRODUCTS

Hangar Wash Rack. 2 Station

2.1 AIRCRAFT WASH SYSTEM

Complete Aircraft wash system shall consist of pre-engineered and assembled stand-alone equipment components to provide three modes consisting of a foaming system, a hot water wash system and a high volume rinse system. Each system will be individually routed to Two(2) separate remote stations located at wash bay. Each remote station will be an assembled combination of a foaming system REM, wash system REM, and a rinse system REM. Each REM will include appropriate control panel, hose reel, hose, wand, and nozzle.

2.2 FOAMING SYSTEM

Foaming systems shall be stand-alone, self-contained, naturally aspirated, stackable systems with dual integral flow meter dilution of cleaning compound concentrate for maximum mix ratio of up to 1:2. Foaming system machines shall be all steel fabrication construction using ISO Certified metal preparation and powder coating. Each foaming system shall function independent of other system with respect to all operational aspects and dedicated to a corresponding Remote Equipment Module (REM) at a specific remote station.

Each foaming system shall be designed to flow 7.6-lpm (2-gpm) of mixed solution via an integral positive displacement pump operating at a backpressure up to as high as 5.5-Mpa (800-psi). Piping from each foaming system to associated REM shall be 12.7-mm (0.5-inch) schedule 80.

2.2.1 Utility Requirements

a. Electrical - Foaming systems shall use electrical power supply in accordance with project design and have integral disconnect.

b. Water Supply – Foaming systems shall be provided with a water supply having minimum delivery capability of 8-lpm (2.1-gpm)at delivery pressure of 275-kpa (40-psi).

c. Control – Foaming systems shall have local controls integrated with controls at corresponding REM located at remote station. Each foaming system shall operate automatically as a function of demand from corresponding REM station.

d. Foam Generation – Foaming system foam generation shall be naturally aspirated at REM stations, no compressed air will be used.

2.2.2 Foaming System Remote Equipment Module (REM)

a. REM Stand Construction – Shall be all steel fabrication construction using ISO Certified metal preparation and powder coating. Stand shall be constructed with a single pedestal leg for floor mounting. REM shall be completely assembled with control panel, hose reel, guide rollers and supplied with hose whip interface where applicable for installation. Foaming system REM units shall ship bolted together in combination with other REM units per design, to form complete remote station.

b. Hose Reel and Hose – Hose reel shall be Spring Retract mounted to REM stand with 9.5-mm (0.375-inch) hose, 30-M (100-feet)long, rated for 27.6-Mpa (4,000-psi).

c. Control Panel – Shall be constructed of high impact polycarbonate labeled for best identification and use. Control panel shall include selection of three(3) separate functions defined as follows.

- Off: Foam generation OFF, dispense inactive
- Foam: System ON, dispense by wand trigger activation
- Rinse: Foam OFF, water flows to clean entire system line

a. Wand – Wand shall be a single lance, hand held trigger operated, spring return.

d. Nozzles - Foaming system trigger wand shall be supplied with three(3) different naturally aspirated foam generating Mega nozzles to allow user variations of throw distance and coverage to meet specific conditions. Each nozzle shall have adjustable spray ranging from full stream to fog.

2.3 WASH SYSTEM

Hot/Cold water wash system machines, natural gas fired, shall be stand-alone, self-contained, frame mounted for placement and securing in equipment room in accordance with project design. Self-contained wash systems shall include integral burner, heating coil, motor, pump, control panel and assembled as a complete system ready for installation interface.

Wash system frame construction shall be all steel fabrication construction using ISO Certified metal preparation and powder coating. Machine components shall include stainless steel equipment cover and coil stainless steel wrap.

Each wash system shall be designed to flow 19-lpm (5-gpm) using a positive displacement pump capable of operating at a backpressure up to as high as 20.7-Mpa (3,000-psi). Piping from each wash system to associated Remote Equipment Module (REM) shall be 12.7-mm (0.5-inch) schedule 80.

2.3.1 Utility Requirements

a. Electrical - Wash system machines shall use electrical power supply in accordance with project design and have integral disconnect.

b. Water Supply – Wash systems shall be provided with a water supply having minimum delivery capability of 30-lpm (8-gpm)at delivery pressure of 275-kpa (40-psi).

c. Fuel Supply – Natural gas supplied by government at volume and pressure required by equipment manufacturer.

d. Control – Wash system machines shall have local controls integrated with controls at corresponding REM located at remote station. Each wash system machine shall have thermostat temperature control and automatically heat water in response to operator control at wash bay.

e. Exhaust – Wash system manufacturer shall provide exhaust power vent as part of equipment scope of supply. Wash system machine exhaust venting shall be installed by contractor provided licensed HVAC specialist in accordance with project design and local codes.

2.3.2 Wash System Remote Equipment Module (REM)

a. REM Stand Construction – Shall be all steel fabrication construction using ISO Certified metal preparation and powder coating. Stand shall be constructed with a single pedestal leg

for floor mounting. REM stand shall be completely assembled with control panel, hose reel, guide rollers and supplied with hose whip interface where applicable for installation. Wash system REM stand shall be supplied bolted together in combination with other REM units per design to form a complete remote station.

b. Hose Reel and Hose – Hose reel shall be Spring Retract mounted to REM stand with 9.5-mm (0.375-inch) hose, 30-M (100-feet)long, rated for 31-Mpa (6,000-psi).

c. Control Panel – Shall be constructed of high impact polycarbonate labeled for best identification and use with lighted indication. Control panel shall include selection of two(2) separate functions defined as follows.

- Start/Stop: Wash system machine control
- Burner On/Off: Hot water or cold water machine control

d. Wand – Wand shall be trigger operated, spring return, variable pressure with 42” lance.

e. Nozzles – Wash system shall use threaded, 40-degree, flat fan spray nozzle in conformance to aircraft program management and to applicable technical manual for aircraft serviced.

2.4 RINSE SYSTEM

Cold water rinse system machine shall be stand-alone, self-contained, skid frame mounted for placement and securing in equipment room in accordance with project design. Self-contained rinse system shall include motors, pumps, control panel and assembled as a complete system ready for installation interface.

Rinse system skid frame construction shall be all steel fabrication construction using ISO Certified metal preparation and powder coating. Rinse system shall include dual pumps and dual controls to serve two separate remote stations. System skid shall include a 1,890-liter (500-gallon) onboard buffer tank ensuring stable flow balance during active use.

Each pump of rinse system shall be designed to flow 115-lpm (30-gpm) using stainless steel vertical pumps designed for adjustable operating pressure up to 1,380-kpa (200-psi). Piping from each rinse system pump to associated Remote Equipment Module (REM) shall be contractor decision sized for flow and rated for operating pressure.

2.4.1 Utility Requirements

a. Electrical - Rinse system machine shall use electrical power supply in accordance with project design and have integral disconnect.

b. Water Supply – Rinse system shall be provided with a water supply having minimum delivery capability of 230-lpm (60-gpm)at delivery pressure of 275-kpa (40-psi).

c. Control – Rinse system machine shall have separate station local controls integrated with controls at corresponding REM located at remote stations in wash bay.

2.4.2 Rinse System Remote Equipment Module (REM)

a. REM Stand Construction – Shall be all steel fabrication construction using ISO Certified metal preparation and powder coating. Stand shall be constructed with a single pedestal leg for floor mounting. REM stand shall be completely assembled with control panel, hose reel, guide rollers and supplied with hose whip interface where applicable for installation. Each rinse system REM stand shall be supplied bolted together in combination with other REM units per design to form a complete remote station.

b. Hose Reel and Hose – Hose reel shall be Spring Retract mounted to REM stand with 24.5mm (1-inch) hose, 30-M (100-feet)long, rated for 6.9-Mpa (1,000-psi).

c. Control Panel – Constructed of high impact polycarbonate labeled for best identification and use with lighted indication. Control panel shall include selection of Start/Stop.

d. Wand – Wand shall be hand held, trigger operated, spring return, for safety of personnel and equipment.

e. Nozzles – Single hand rotating variable spray to provide rinse variation from full stream to fog.

PART 3 EXECUTION

3.1 INSPECTION

Inspect each component for compliance with requirements specified in Part 2 Products. Re-design or modification of equipment to comply with specified requirements, or necessary re-design or modification following failure to meet specified requirements, shall receive particular attention for adequacy and suitability. This element of inspection shall encompass visual examinations and dimensional measurements.

Noncompliance with specified requirements or presence of one or more defects preventing or lessening maximum efficiency of system operation, shall constitute cause for rejection. Equipment supplier shall be on-site for final inspection, system start-up, training, and commissioning.

3.2 INSTALLATION

Install components per manufacturer's recommendation. System should be delivered pre-packaged/turn-key and should require no on-site fabrication.

3.3 FIELD QUALITY CONTROL

All equipment assemblies shall be manufactured, assembled and tested by an ISO 9001:2015 Registered manufacturer. Equipment manufacture shall have minimum 10-years of experience on similar type equipment for military air base installations.

3.4 STARTUP

System startup should include government supplied, one 200-liter (50-gallon) drum of Type 4 aircraft soap for testing, training and commissioning. Equipment supplier to review the entire installation using factory employed and trained service technicians.

3.5 OWNER TRAINING

Equipment supplier to hold up to 8 hour training on operation and maintenance.

3.6 TESTING REQUIREMENTS

Equipment supplier to provide complete on-site testing to confirm operational performance, flows and pressures. For any unacceptable items, describe corrective action to be taken or recommended. Include detailed descriptions of points inspected, tests and adjustments made, quantitative results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance. Include manufacturer's documentation that equipment conforms to specified requirements and is ready for permanent operation and that nothing in installation will render manufacturer's warranty null and void.

PLUMBING, GENERAL PURPOSE requirements.

3.6.1 Pre-Operational Test

Equipment supplier to test all flows and pressures in the presence of or at direction of the commissioning agent or other government representative.

-- End of Section -