

SECTION GR-A

GENERAL DESCRIPTION AND SCOPE OF WORK

1. **GENERAL DESCRIPTION:** This section covers the general description, scope of the work, and supplementary requirements for Equipment, Materials, and Services included under these specifications.

1.1 Equipment and Materials shall be new, unused and undamaged and shall have an expected useful life of 30 years in Base Load Operation, with scheduled maintenance, for a typical base load operating mode and the following conditions:

No. of cold starts:	1 per year
No. of warm starts:	2 per year
No. of hot starts:	2 per year
Max Operating Hours:	8700 per year

Where each type of plant startup mode is defined as:

- a. **Hot start** shall mean a start-up with eight (8) hours or less since the unit has been shut down, following the normal (hot) shutdown procedure.
- b. **Warm start** shall mean a start-up with greater than eight (8) hours and no more than seventy-two (72) hours since the unit has been shut down following the normal (hot) shutdown procedure.
- c. **Cold start** shall mean a start-up with greater than seventy-two (72) hours since the unit has been shut down following the normal (hot) shutdown procedure.

1.1.1 Only proven and tested technology of the same model or nominal size and design conditions and in successful operation for at least five (5) years in the exact same application shall be provided. There shall be no exceptions to this clause.

1.2 All Equipment and Materials shall be suitable for safe and satisfactory operation for the intended service including Equipment operating conditions and under all ambient conditions and load factors stated below in Site Conditions and Load Parameters. Asbestos-containing materials shall not be used.

2. **SCOPE OF WORK:** The Seller shall provide the specified equipment, drawings, engineering process and design data, field services, special tools, operation and maintenance manuals, spare parts list, miscellaneous materials and services, and shall participate in design conferences, all as specified herein.

2.1 The equipment will be tested after erection to demonstrate its ability to operate under the conditions and fulfill the guarantees as set forth herein. If the tests indicate that the equipment fails to meet guaranteed performance, the Seller shall make modifications and perform additional testing at the Seller's expense as required to render the equipment fully functional and in compliance with the specified guarantees.

3. SITE CONDITIONS AND LOAD PARAMETERS:

3.1 Plant Elevation above sea level:

- a. Power Block = 1205 feet
- b. Gas Insulated Switchgear (GIS) = 1200 feet
- c. Water Treatment = 1215

3.2 Atmospheric Pressure = 14.07 psia

3.3 Frost Line Depth = 42 inches below grade

3.4 Risk Category = III

3.5 Seismic:

- a. Site Class = C
- b. Long-period transition period, $T_L = 12$
- c. Design Spectral Response Acceleration Parameters, $S_{DS} = 0.076g$; $S_{D1} = 0.041g$
- d. Seismic Importance Factor, $I_e = 1.25$
- e. Seismic Design Category: A

3.5.1 Seismic load generation shall be determined using ASCE 7 based on the following types of structure or component:

- a. Building Structures: Chapter 12
- b. Non-Building Structures: Chapter 15
- c. Non-Structural Components: Chapter 13

3.5.1.1 For Equipment where the specific seismic coefficients of Table 15.4-2 of ASCE 7 do not apply, the following shall be used:

- a. $R = 1.25$
- b. $\Omega_0 = 2.0$
- c. $C_d = 2.5$

3.6 Wind:

- a. Basic Wind Speed, $V = 117^*$ mph
- b. Exposure Category = C
- c. Topographic Factor, $K_{zt} = 1.0$
- d. Ground Elevation Factor, $K_e = 1.0$

* Nominal 3-second gust at 33 ft. above ground for exposure C category.

3.6.1 Wind load generation shall be determined using ASCE 7. No reduction shall be made for the shielding effort of vessels or structures adjacent to the equipment being designed.

3.7 Snow:

- a. Ground Snow Load, $p_g = 35$ psf
- b. Exposure Factor $C_e = 1.0$
- c. Thermal Factor $C_t = 1.0$ (1.2 for outage conditions)
- d. Importance Factor $I_s = 1.1$

3.7.1 Snow load generation shall be determined using the Pennsylvania Uniform Construction Code and ASCE 7.

3.8 Ice (where applicable):

- a. Nominal Thickness $t = 1.0$ " (at a height of 33 feet)
- b. Importance Factor $I_i = 1.15$ for ice loading only
- c. Importance Factor $I_w = 1.0$ for ice and wind loading
- d. $K_{zt} = 1.0$

3.8.1 Ice load generation shall be determined using ASCE 7.

3.9 Precipitation:

- a. Average Annual Rate = 46.48 in
- b. Design Storm Event: 25 year, 24-hour rainfall = 4.27 in
- c. Design Storm Event: 100 year, 24-hour rainfall = 5.41 in

3.10 For Equipment located Outdoors:

- a. Ambient dry bulb temperature:
 - 1. Maximum = 105 °F
 - 2. Minimum = -20 °F
 - 3. Average Annual: = 48.8 °F
- b. Relative Humidity:
 - 1. At Average Annual Dry Bulb = 50%
 - 2. Maximum = 100% @ 90°F

3.11 For Equipment located Indoors (Ventilated and Heated Only):

- a. Ambient dry bulb temperature:
 - 1. Maximum = 104 °F
 - 2. Minimum = 45 °F
 - 3. Average Annual: = 70 °F
- b. Relative Humidity:
 - 1. At Average Annual Dry Bulb = 60%
 - 2. Maximum = 100% @ 90°F

3.12 For Equipment located Indoors (Air Conditioned):

- a. Ambient dry bulb temperature:
 - 1. Maximum = 78 °F
 - 2. Minimum = 72 °F
 - 3. Average Annual = 75 °F

4. **NOISE LEVELS:** The A-weighted sound pressure level resulting from the operation of equipment furnished under these specifications (including drive motors) shall not exceed a free-field spatial arithmetic average (per piece of equipment) of 85 dBA along the equipment envelope at a height of 5 feet above the ground and personnel platforms. The equipment envelope is the perimeter line that completely encompasses the equipment package (including noise control devices) at a distance of 3 ft from the equipment face.

4.1 *Noise Testing Methods:* During commissioning, when the facility is in full operation, the Buyer shall, at its own discretion, conduct noise testing to establish the equipment noise emissions. The noise emissions test shall be conducted in accordance with the test protocol detailed herein as adapted from industry standards including NOM-011-STPS-2001, ANSI B133.8, ANSI/ASME PTC 36, ANSI S1.13, and ANSI S12.18. The Seller shall be notified prior to the survey and given the opportunity to witness the testing. The survey shall be conducted by personnel who are qualified through experience or training to conduct industrial facility noise surveys.

4.2 *Measurement Instrumentation:* All sound level measurements shall be conducted using a sound level meter that meets the requirements of ANSI S1.4. The sound level meter shall be equipped with integrating capabilities to determine the average sound levels over a specified duration. For all measurements, the microphone shall be equipped with a windscreen provided by or recommended by the sound level meter manufacturer. If necessary, the microphone shall be mounted on a tripod to maintain stability.

4.2.1 The sound level meter shall be field calibrated immediately before and after each measurement series and after any major change in equipment conditions such as rough handling, becoming wet, etc. Field calibration shall be conducted using a precision calibrator and each calibration level shall be recorded. A change in calibration level exceeding +/- 1.0 dB may require that the measurement series be repeated.

4.2.2 The sound level meter equipment and calibrator shall have been laboratory calibrated within the 12 months prior to the testing. All equipment calibration certificates shall be available during the survey and copies shall be included with the final survey report.

4.3 *Measurement Conditions:* Any variation from the rated load shall be noted. Equipment that is not typically required for normal facility operation shall not be operating during the surveys. All equipment enclosures shall be fully installed and all doors and openings shall be closed.

4.3.1 Outdoor sound level measurements shall not be conducted during adverse weather conditions or conditions which may damage the instrumentation. Measurements should be avoided during periods when the average wind speed exceeds 7 mph measured 5 feet above the ground or platform. Measurements during excessive wind speeds shall be noted on the data sheets. Measurements shall not be conducted during periods of precipitation or wet surface road conditions if such conditions increase the background noise. Weather conditions shall be noted on the measurement data sheets.

4.4 *Environmental Sound Level Survey:* If local conditions such as background noise, accessibility, reflecting surfaces, screens, topographical conditions, or other restrictions preclude meaningful measurements at the measurement locations, alternate locations may be selected provided proper corrections are made in accordance with the referenced standards. The exact locations shall be determined at the time of testing. The background and operational measurements shall be taken at the same measurement locations. The microphone shall be positioned approximately 5 ft above the ground for all measurements.

4.4.1 The sound level survey shall include operational sound level measurements at the prescribed locations during normal operation of the equipment. All non-equipment noise sources that are audible during the measurement period shall be noted on the data sheets. The sound level survey shall include background sound level measurements at each operational measurement location during a period when the equipment is completely shut down. The background sound level measurements shall be conducted during a period that experiences ambient conditions similar to the background conditions experienced during the operational measurements.

4.4.2 The sound level measurements shall include the $\frac{1}{3}$ -octave band 90-percentile exceedance sound level, L90. The duration of the measurement shall be sufficiently long to capture a representative sound level at the measurement location. All sound level measurements shall be recorded during a period of minimal background influence, i.e. between vehicle passes, aircraft flyovers, train passes, and other discrete non-facility sources. The measurement may be paused during such discrete noise sources if necessary to achieve the minimum measurement period.

4.4.3 Background sound level measurements shall be deemed unnecessary if the operational measurements, without any corrections for background noise, are equal to or less than the noise criteria. Additionally, if representative background sound level measurements indicate that the background sound levels are at least 10 dBA below the operational sound levels, the influence of the background noise shall be deemed negligible and further background sound level measurements shall not be necessary. If the measured background sound level is not at least 3 dBA below the measured operational sound level, alternate measurements may be conducted. Alternate measurements may include conducting measurements at locations closer to the equipment (within the far-field) or during periods when the background noise is lower. The alternate measurements should provide background sound levels that are at least 3 dBA lower than the operational sound levels. If the measured operational sound level does not exceed the measured background sound level by at least 3 dBA and alternate measurements were not available as previously described, the operational sound level shall be deemed not to be contributing to the background. Thus, the equipment sound pressure level shall be assumed to be 10 dBA below the

measured background level or equivalent to the noise criteria adjusted to the measurement location, whichever is lower.

4.4.4 The equipment sound level at each measurement location shall be determined by correcting the measured operational sound level in accordance with the referenced standards to account for background noise, if necessary. Following the background correction, the equipment sound level at all measurement locations that are not at the prescribed receptor location shall be corrected in accordance with the referenced standards for the distance to the receptor location.

5. UTILITIES:

5.1 Compressed Air: Filtered and dried compressed air will be supplied for operation of pneumatic instruments and control valves. The compressed air will be supplied at receiver pressure varying from 90 to 120 psig. All pneumatic instruments and diaphragm-operated valves shall be designed to operate within this range.

5.1.1 Pressure regulators shall be provided for pneumatic devices that operate at pressure levels other than receiver pressure.

5.2 Equipment Cooling Water: Cooling water, consisting of 50% propylene glycol and 50% water, will be available at 105 °F for cooling bearings, drives, and other equipment as required. A complete listing of all Equipment requiring cooling water shall be submitted, including flows, heat loads, and pressure drops. Equipment utilizing cooling water shall be designed for 150 psig design pressure. Cooling water equipment shall be sized to not exceed a pressure drop of 10 psid or a 20 °F temperature rise. Cooling water will be from a closed loop cooling circuit.

6. REFERENCED STANDARDS: All equipment and materials furnished shall be in conformance with the latest edition of all applicable codes, regulations, and standards in effect on April 1, 2025. As a minimum, the following shall be adhered to:

- a. Pressure Piping: All pressure piping will be furnished, installed, and tested in accordance with the requirements of ASME B31.1 (Power Piping).
- b. Boilers and Pressure Vessels: All boilers and pressure vessels shall be fabricated, assembled, inspected, and tested in accordance with Section 1 (Power Boilers) of the ASME Boiler and Pressure Vessel Code, Section VIII of the ASME Boiler and Pressure Vessel Code.
- c. Boiler, Pressure Vessel and Pressure Piping Registration: All pressure vessels shall be ASME Boiler and Pressure Vessel Code, Section VIII stamped and registered with the National Board of Boiler and Pressure Vessel Inspectors.

6.1 Unless otherwise specified in the Technical Specification sections, the following codes and standards shall apply:

Codes and Standards List:

American Association of State Highway and Transportation Officials (AASHTO)

American Bearing Manufacturers Association (ABMA)

American Concrete Institute (ACI)

American Gas Association

American Gear Manufacturers Association (AGMA)

American Industrial Hygiene Association

American Institute of Steel Construction (AISC)

American Iron and Steel Institute (AISI)

American National Standards Institute (ANSI)

American Petroleum Institute (API)

American Society of Civil Engineers (ASCE)

American Society of Mechanical Engineers (ASME)

American Society for Nondestructive Testing (ASNT)

ASTM International (ASTM)

American Welding Society (AWS)

American Water Works Association (AWWA)

United States Department of Homeland Security (DHS)

United States Department of Energy (DOE)

Expansion Joint Manufacturing Association (EJMA)

Environmental Protection Agency (EPA)

Electric Power Research Institute (EPRI)

Fluid Controls Institute (FCI)

Federal Energy Regulatory Commission (FERC)

FM Global (FM)

International Building Code (IBC)

International Electrotechnical Commission (IEC)

Institute of Electrical and Electronics Engineers (IEEE)

International Fire Code (IFC)

International Society of Automation (ISA)

International Organization for Standardization (ISO)

Manufacturers Standardization Society (MSS)

National Association of Architectural Metals Manufacturers (NAAMM)

NACE International (NACE)

National Electrical Code (NEC)

National Electrical Manufacturers Association (NEMA)

North American Electric Reliability Corporation (NERC)

National Fire Protection Association (NFPA)

National Institute of Standards and Technology (NIST)

Occupational Safety and Health Administration (OSHA)

Pennsylvania Uniform Construction Code (UCC)

Research Council on Structural Connections (RCSC)

Society for Protective Coatings (SSPC)

Sheet Metal and Air Conditioning Contractor's National Association (SMACCNA)

Thermal Insulation Manufacturers Association (TIMA)

Tubular Exchanger Manufacturers Association (TEMA)

Underwriters Laboratories (UL)

6.2 Seller shall obtain Buyer approval for any deviation to these standards or alternative standards. Request for deviation or alternative shall include an explanation why such change is necessary and how compliance is to be achieved. Buyer reserves the right to reject any such request for any reason. If the Seller discovers any conflict between any code, standard, or regulation, the Seller shall notify the Buyer of the conflict. The Buyer in its sole discretion shall then choose which provision shall take precedence over the conflicting provision. Unless specific exceptions are indicated in the Agreement, all specifications will be considered applying to all phases of the Work.

7. **UNITS OF MEASUREMENT:** The following table shows the units of measurement to be displayed on all submittals.

	ENGLISH	
Distance-Long	foot	ft
Distance-Short	inch	in
Weight (mass)	pound	lb
Temperature	Fahrenheit	°F
Pressure (pipe)	lb/in ²	psi
Pressure (structural)	lb/ft ²	psf
Velocity	ft/sec	fps
Fluid Flow (volume)	cu. ft/min	cfm
	gal/min	gpm
Fluid Flow (mass)	lb/hr	pph
Heat (HVAC)	British Thermal Unit	BTU
Power (thermal)	Btu/hour	BTU/hr
Power (electrical)	Horsepower	HP

8. **MISCELLANEOUS EQUIPMENT, MATERIALS AND SERVICES:** Miscellaneous Equipment, Material and Services not otherwise specifically called for shall be furnished by the Seller in accordance with the following:

- a. All nuts, bolts, gaskets, special fasteners, backing rings, etc., between components and equipment furnished under these Specifications.
- b. All base plates, sole plates, bearing plates, leveling plates, slide plates, hold-down anchor clips or devices, anchor bolt templates, and embedments as required for securing to foundations and support structures, except for anchor bolts or anchor rods.
- c. All piping integral to or between any equipment furnished under these Specifications, except as otherwise specified. This includes all vents,

drains, instrument piping, and other piping Work required for a complete unit.

- d. All necessary connections for the Buyer's piping and instruments. Seller shall provide a connection list, which identifies all connections including small bore and instrumentation connections. Each connection shall be provided with a unique number and shall list the following information as a minimum: Complete process data including min/max/normal flow, pressure and temperature; Connection information including size, connection rating, connection material, connection type and connection location; Detailed drawing number reference. This unique number shall also exist on the general arrangement drawing to identify the physical location of the tie-in interface.
- e. All necessary instrument, power and control wiring and raceways integral to any equipment furnished under these Specifications. This shall include terminal blocks and internal wiring to these terminal blocks for Equipment requiring external connection.
- f. Hangers and accessories, fabricated to the greatest extent possible, for all piping furnished under this Material Contract with all components collated, bagged, and tagged.
- g. Coupling guards for all exposed shafts and couplings
- h. Leveling blocks, sole plates, thrust blocks, matching blocks, and shims.
- i. One complete set of start-up and commissioning consumable spare parts per unit.
- j. Detailed erection drawings, prints, information, instructions, and other data for use by the Buyer.
- k. Each equipment compartment shall have a laminated and engraved nameplate attached to the exterior panel frame with stainless steel self-tapping screws. Nameplates shall read as indicated on the equipment drawings. Nameplates shall be white face, black characters with minimum quarter-inch (1/4") high letters.
- l. Supply all special tools or lifting beams and lugs for offloading
- m. Initial fill of lubricants, fluids and media
- n. The use of all special tools required for erection of the equipment. Erection tools shall remain the property of the Seller and all shipping costs to and from the Job Site shall be at the Seller's expense.
- o. All special tools required for dismantling and maintenance of the equipment. All special tools shall be new and unused and shall become the property of the Buyer for transfer to the Owner.
- p. In addition to having software loaded on the equipment furnished under this Agreement, master CDs or disks containing all operating system and applications software shall be provided. The operating system software furnished shall include all software required for debugging, making programming and graphics changes, and printing annotated program documentation.
- q. Two (2) copies of the applications and operating system software at the time of equipment shipment shall be provided.

- r. All equipment and associated components shall be fabricated and assembled to the greatest extent possible (limited only by DOT shipping dimensions and weights).

9. DESIGN CONFERENCE: The Seller's design engineers shall attend a design conference at a time and place selected by the Buyer to discuss matters relative to the execution of this Material Contract. The Seller's design engineers shall attend additional design conferences as required by the Buyer thereafter to expedite the Work.

10. SPARE PARTS: A complete spare parts list shall be submitted per the requirements of Section GR-B, which shall include the following three categories that are detailed in Section GR-B: Mandatory Construction and Commissioning Spare Parts, Recommended Start-Up Spare Parts, and Recommended Operational and Maintenance Spare Parts. Additionally, a complete set of Mandatory Construction and Commissioning spare parts shall be included in the Seller's scope. The Buyer or Owner will retain the option of purchasing any quantity of any one or any combination of spare parts listed at the prices quoted until 360 days after the Material Contract Award.

11. CONSTRUCTION MANAGEMENT SYSTEM: The Seller and subcontractors shall provide, to the Buyer, engineering, procurement, production, scheduling, and shipping information for the equipment, including sub-suppliers equipment. Such information shall be provided in the detail and format and at the frequency required by the Buyer. The information shall be submitted by the first of each month or more frequently as determined by the Buyer. The information will be used by the Buyer for schedule monitoring purposes, to ensure that schedule interfaces with other suppliers and subcontractors are met, and to monitor overall Project performance.

END OF SECTION