18.3 QUESTIONS AND RESPONSES

1. Dimension of the coal conveyor trench that has to be filled with concrete and what is the bag mix that you are looking for, can you use fly ash in that mixture.

ANSWER: The dimension of the coal conveyor trench to be filled with concrete is shown on Sheets R-163-S-10 and R-163-S-12. Concrete is to meet the requirements of Specification 03301. Options and requirements for the use of fly ash are included in that specification.

2. How many Trench Covers and grates are there and after you remove above coal trench them can you fill void with non shrinking grout.

ANSWER: The number and area of trench covers for removal is shown on Sheet R-163-S-10. See Addendum No. 1 for clarification regarding partial removal of trench covers. As shown on R-163-S-10 and R-163-S-12 the conveyor trench is to be filled with concrete.

3. How long and how many Stair cases to be removed and can you fill void with non shrinking grout.

ANSWER: The length and number of stairs to be removed is shown on Sheet R-163-A-1. Holes from the stair support anchorage in concrete can be filled with nonshrink grout as specified in Section 02050.3-3.01.

4. How much brick is there in that coal conveyor trench and are there any special removal provisions.

ANSWER: The entire conveyor trench is filled with bricks and debris. Bricks and debris shall be removed in accordance with Section 02050.

5. How many door and frames have to be removed and are their any special instructions for removing these door.

ANSWER: The number and location of doors and frames to be removed is shown on Sheet R-163-A-1. There are no special instructions for removing these doors and frames. The requirements of the drawings and specifications, including Note 5 from Sheet R-163-A-1 and Specification 02050 Demolition apply to this work.

6. What do you mean when you say clean and prep all concrete walls and what is the area to be cleaned, can you clean it with high pressure washer-what is the psi and cleaning solutions to be used.

ANSWER: Surface preparation for concrete to be painted is specified in Specification 09920, Section 3-1 and 3-1.03. The ceiling area to be prepared for painting and painted is shown on Sheet R-163-A-7 and R-163-A-8. The wall area to be prepared for painting and painted is identified on the Room Finish Schedule on Sheet R-163-A-9.

7. Can I please have the dimension of that outside loading ramp on the south west side of the structure that is to be removed and filled in.

ANSWER: The dimensions of the truck ramp can be obtained from Sheets R-163-C-1 and R-163-C-3.

8. Does the concrete in that space have to be removed before it is filled in or can it just be filled in.

ANSWER: Demolition of the concrete truck ramp is identified on Sheets R-163-C-1 and R-163-C-3.

9. What material can be used to fill in that space.

ANSWER: Fill requirements for the space are shown on Sheet R-163-C-3.

10. How thick a concrete slab do you want on the top and what bag mix.

ANSWER: Thicknesses of the fuel tank slab and common equipment slab are shown on Sheets R-163-S-12 and R-163-S-13. Concrete is to meet the requirements of Section 03301. Thickness of asphalt pavement is shown on Sheet R-163-C-3.

11. Please provide a more legible copy of the drawings in the report for Exhibit D. The drawings and sketches with the associated hand written text is not readable.

ANSWER: More legible copies of the figures in Exhibit D have been provided as part of Addendum No. 1.

12. If Exhibit E is not available to the Prime contractors bidding the project, how can you hold the Prime bidder legally responsible for it in the contract?

ANSWER: In accordance with the City of Milwaukee Charter and Code of Ordinances Chapter 311-5(2), it has been determined that Appendix E is to be issued to only the generator manufacturers as they retain warranty responsibility for that device and that the potential harm to the public interest outweighs the benefit of providing that information to others.

13. Section 11910, p. 7 – "Engine-generators submitted with ratings in excess of current published data will not be acceptable" – does that mean manufacturer's published data for a specific Model/Output Rating?

ANSWER: Published data is for a specific Model/Output rating. Manufacturer's published data is what is readily available from the manufacturer for a specific Model/Output rating. For clarification, a letter indicating that a smaller unit can provide increased capacity than what is published shall not be acceptable.

14. Section 11910, p. 10 – Surge Protection – "Each engine…installed in the generator terminal box or in a separate enclosure near the generator terminal box" – The one-line diagram shows these located in the switchgear lineup. Which location is preferred?

ANSWER: Separate surge arrestors are required at both the generator per Specification 11910 and at the switchgear as shown on Sheet R-163-E-5. Furnish surge arrestors for the switchgear feeder SWG1-3.

15. Section 11910, p. 11 – The proposed day tanks appear to be undersized. A 2500 kW generator set will burn approximately 190 gallons per hour at full load, which would keep the day tank pumps running continuously.

ANSWER: The maximum amount of No. 2 diesel fuel (Class II combustible liquid) in approved exhausted enclosures that can be stored inside a building is 240 gallons, or the building must be rated "High-Hazard Group" occupancy. Retrofitting the existing pump station to such an occupancy class is not practical. Day tanks are specified to have lead/lag supply pumps, each with a 7 gallon per minute capacity or 420 gallons per hour per pump. It was recognized that because of the limitation of the amount of fuel inside the building that there would be numerous start and stops of the supply pump, and this is the reason a lead/lag configuration was utilized.

16. Section 11910, p.24 – Shop Tests – "Manufacturer shall shop test each engine-generator set with its control panel and remote mounted radiator…" – does this mean the engine manufacturer's engine mounted control panel or the generator control included in the switchgear lineup? Do the remote radiators have to be the same units which are going to be delivered to site? Is the 1-hour load bank test per unit or all three units in parallel?

ANSWER: Each engine-generator shall be shop tested with the unit mounted control panel and the remote radiator to be used at the project site. The 1-hour load bank shop test is per unit, not all three units in parallel.

17. 11910.1-5 Spare Parts: Is the quantity of spare parts per unit and the values indicated in "sets" to be multiplied by three to meet the "per unit" requirement? For example, if the engine oil filter quantity per engine is five (5) and if four (4) sets are required per unit, please confirm this would mean sixty (60) oil filters would be required.

ANSWER: Because a service and maintenance agreement is include in the scope of work, the spare parts listed in Paragraph 1-5 shall not be required. Delete the following from Section 11910.1-5:

"Spare Parts	**Quantity (per unit)**
Air filters.	**2 sets**
Oil filters.	**4 sets**
Fuel filters.	**12 sets**
V-belts for radiator.	**2 sets**
Crankcase filter media.	**2 sets"**

18. 11910.1-5 Spare Parts: The crankcase filter media is factory recommended to be replaced at overhaul which is 6,000 hours for this type engine and application. Based on this, is the crankcase filter media required for this project?

ANSWER: The crankcase filter media spare part requirement has been deleted per the response to Item 11.

19. 11910.1-5 Spare Parts: Can you clarify “non-commercial tools”? An overhaul of the engine requires over $100,000 of factory tools. The overhaul time is 6,000 – 8,000 hours and must be performed by an authorized distributor. Based on the specification requirement of “provided with each unit”, please confirm that over $300,000 of factory tools are required?

ANSWER: Because of the expected length of time before engine overhauls are needed, the requirement for non-commercial tools required for complete overhaul shall be deleted. Delete the following sentence from 11910.1-5:

“One set of non-commercial tools required for complete overhaul shall be provided with each unit.”

20. 11910.2-3 Acceptable Manufacturers: Is the Supplier of the engine-generator required to have an employee of their company (distributorship) authorized to maintain, repair or overhaul the engine?

ANSWER: The Supplier of the engine-generator unit is required to have factory trained staff to maintain, repair, or overhaul the engine-generator units within 50 miles of the project site.

21. 11910.2-4.03 Fuel System: The day tank requirements include a line item for a “secondary containment tank”, is this referring to the outer wall of the double wall day tank or is this an additional rupture basin in addition to the outer wall of the double wall day tank?.

ANSWER: The term “secondary containment tank” is referring to the outer wall of the double wall day tank.

22. 11910.2-4.03 Fuel System: Tank drains are not allowed per UL142 Design Criteria for listed secondary containment day tanks, does the tank drain requirement superscede the UL requirement.

ANSWER: The day tank drain is a siphon type drain which has the drain connection located on top of the day tank. Our understanding is that this complies with UL142 requirements. The named manufacturer in the specification lists their tanks as complying with UL142 and includes the siphon drain option. UL and regulatory requirements are not superseded by the siphon type drain requirement.

23. 11910.2-4.03 Fuel System: Lockable handles are not available on the day tank control panel disconnect, is there another means to meet the specification intent?

ANSWER: If lockable handles are not available, then a non-lockable disconnect shall be acceptable provided all NEC code requirements for the configuration supplied are complied with.

24. 11910.2-4.04 Exhaust System: Can a “tower” type structure that is stronger than the specified structural support legs be used for the exhaust silencer? The tower design is the same dimensional footprint as the structural legs.

ANSWER: It is acceptable to cross brace the support legs of the silencer, provided that all of the requirements specified or shown on the drawings for the silencer supports are met.

25. 11910.2-4.06.04 Line Gauges: Please provide the following information for the line gauges: Mechanical or electrical gauges? What Temperature? What Pressure? Are these going to be direct mounted or in a panel? If mechanical gauges what length capillary are we looking for? If mechanical pressure do you want back or bottom connection? What size is the thermo well going to be?

ANSWER: Line gauges specified in 11910.2-4.06.04 are to be of the mechanical type with the operating point at the mid point range of the scale for the unit supplied. The gauges are to be line mounted and viewable by personnel when standing on the operating floor. Capillary length, connection location, and thermowell size shall be as required for the Supplier's piping configuration and mounting arrangement.

26. 11910.2-4.08 Combustion Air Filtration System: Is the air system pressurized? What is the distance from the engine to the building duct?

ANSWER: The combustion air supply system is not pressurized. The combustion air duct connects to the outside wall of the building. Length of the duct is dependent on the location of the air intake on the engine with respect to the building wall. See Sheet R-163-M-2 to determine length.

27. 11910.2-4.09 Electric Governor Control: The engine electronic governor is integral to the engine and is vital to meeting the EPA emissions requirements for diesel engines. The engine governor is not allowed to be removed per factory guidelines. Please confirm that a Woodward Load Share Module would be acceptable in lieu of the Woodward 2301A?

ANSWER: The electronic governor provided must meet the functional and quality requirements of the specification and be equal to the specified governor. Other models will be acceptable provided they are of equal functionality and quality. Specific models will not be reviewed until after award of contract and submittal of shop drawings in accordance with the contract documents.

28. 11910.2-4.11 Generator Component Overcurrent Protection: Is the Generator Component Overcurrent Protection device the same device as the Medium Voltage Load Break Switch as noted in 16345, 2-4 and as noted on sheet 67 of 80 (R-163-E-22) as "Generator Disconnect Switch"?

ANSWER: No.

29. 11910.2-4.11 Generator Component Overcurrent Protection: What are the requirements of the Overcurrent Protection device: Voltage L-L 3 wire or 4 wire? Interrupting Capabilities or kA rating? Amperage? Fusable or non-fusable? Are Spare fuses required? Cable entry and exit? Size of cables? Lightning arresters or surge capacitors? Manually or electrically operated?

ANSWER: The requirements of the overcurrent protection devices are as specified and shown on the drawings and as follows: Voltage L-L is 4,160V 4-wire WYE with low resistance grounded neutral; the neutral is not distributed. Interrupting capabilities or kA requirements are specified in Section 16345, Paragraph 1-2.07. Amperage is specified in Section 16345, Paragraph 1-2.07 and as shown on Sheets R-163-E-3 and R-163-E-5. Load break switches are non-fused as specified in Section 16345, Paragraph 2-4. Spare fuses are required as specified in Section 16345, Paragraph 1-5. Cables at generator terminal boxes and load break switches are anticipated to be top entry and exit. Cable sizes are shown on Sheet R-163-E-5. Lightning arrestors are specified in Section 16050, Paragraph 2-24. Breakers are electrically operated via 125VDC as specified in Section 16345, Paragraph 2-2.05.

30. 11910.2-7 Shop Tests: Is the remote radiator system that is permanently installed at the factory acceptable to perform the shop test? The remote radiator as specified for this project will be provided by a third party supplier and will ship to the job site accordingly.

ANSWER: Factory testing shall be performed with the project radiators. Project remote radiators are to be shipped to the factory for testing.

31. 11910.3-3.01 Performance Test: Is the temporary load bank required to be resistive or resistive/reactive? Please also confirm the temporary load bank capacity is 5,000kW (7,500kW required load for testing less 2500kW permanent load bank)?.

ANSWER: The temporary load bank shall consist of reactive and resistive elements to obtain a 0.8 power factor. The temporary load bank shall be sized as required for the equipment provided and testing requirements. See modifications to Specification 11910 Engine-Generators, Paragraph 3-3.01.

32. 11910.3-5 Maintenance Agreement: Can the permanent load bank be used for the maintenance contract requirements?

ANSWER: The permanent load bank can be used for the maintenance contract.

33. 11910 Other: There is no mention of vibration spring isolators in the specification. It is recommended industry practice to have spring vibrations isolators installed between the generator foundation pad and the generator set.

ANSWER: Each engine-generator will be installed on an inertia foundation as indicated on the contract drawings. Vibration isolators shall be provided as recommended by the manufacturer, if required for proper operation of the manufacturer's unit. If vibration isolators are provided, they shall be designed to accommodate available space in the building and the Contractor shall be responsible for any modifications required to fit the complete system into the available space. All needed modifications shall be reviewed by City and shall be performed by Contractor at no additional cost to City.

34. Drwg E-19: What is the function of a new ISTAR panel?

ANSWER: The function of the control panel is to connect with new and existing devices as identified in Section 08110.1-1.01, 08700.1-1.01 and 16050.2-26. and as shown on the drawings. The control panel will be provided by others as identified in Section 08110.1-1.01, 08700.1-1.01 and 16050.2-26.

35. Drwg E-22: What is the function of the symbol labeled as RS-Q-EWS-01?

ANSWER: EWS is identified as an emergency wash station in the legend on Sheet R-163-H-1.

36. Drwg E-5: What is the size and/or type of feeder from the generators to the neutral grounding resistors?

ANSWER: The conductor between the generator neutral and the neutral grounding resistor shall be rated #1/0, 8kV, 90C.

37. What is the location of Existing SWGR AHU that is shown to be re-fed from new panel PP-G1?

ANSWER: The existing Switchgear Room 115 air handling and air conditioning unit is located on the second floor above the room as shown on R-163-H-2. Relabel Circuit Number 259 on Sheet R-163-E-9 which feeds the existing air conditioning unit with Circuit Number 427.

38. Drwg E-12: What switchgear is being referenced for Cct. LP-G1-35 feeding a switchgear space heater?

ANSWER: The new paralleling switchgear, RS-E-SWG-01.

39. Does the Arc Flash Hazard Analysis cover ONLY the new equipment installed under this contract per 16060-19 3-2? Or does it also include all the existing electrical equipment as indicated on 16050-21 fourth paragraph in which it states we are to coordinate with the City to obtain the necessary data on existing equipment?

ANSWER: The Arc Flash Analysis shall cover each piece of equipment installed or modified under this contract. Delete the first sentence of Specification 16050.3-2 and replace with the following sentence: "Contractor shall commission an Arc Flash Hazard Analysis for each piece of electrical equipment installed or modified under this contract in accordance with OSHA 29 CFR Part 1910, NEC, NFPA 70E, and IEEE 1584 and shall submit an Arc Flash Hazard Analysis report as specified herein." The statement regarding the Contractor being responsible for obtaining information for all new and existing electrical equipment is a requirement for the Coordination Study, as this item is listed in the Coordination Study requirements (Paragraph 3-3 Coordination Study). Information from the Coordination Study shall be used in association with the Arc Flash Analysis as specified in 16050.3-2.

40. There is a requirement for providing fire rated insulation on conduits for the NEC 708 system. The specification notes that all conduits connected to the

system shall be so insulated. Does this requirement mean that every conduit to each of the pump station pumps, all equipment connected to all of the G1-G4 or lighting panels would be required to be protected? If so, is there a list of each conduit that requires protection, the size and the distance?

ANSWER: Only conduit for feeder circuits are required to have a conduit protective system with a minimum 1-hour fire rating, as specified in 16050.3-7.01.b.

41. Are the existing mains and tie breakers in the existing 4160v substation capable of remote operation? If not, how is the generator sync control going to open/close the breakers? What modifications to the existing breakers are required for the proposed system?

ANSWER: The existing mains and tie breakers are capable of remote operation. Modifications to the breakers are not required. Interconnections are required for the circuit breakers control circuit as shown on Sheets R-163-E-15 and R-163-E-16.

42. How is the actual connection supposed to be made at the existing 4160v bus at the substation for the new generator feeders and / or the transformer feed to the remote circuit breaker? Is the bus just to be “drilled & tapped”?

ANSWER: Modifications to the 5kV switchgear are to be made using equipment construction guidelines setforth by ANSI. The material and modifications shall match the existing switchgear. It may be necessary to obtain the services of a representative from a 5kV switchgear manufacturer to provide guidance for the modifications, if unfamiliar with the ANSI and NECA 1000 requirements related to this work. One connection method may consist of drilling the existing buses and attaching two-hole cable lugs with appropriate fastening hardware and torque settings. Cables supports inside the switchgear and insulating material may be required. Each connection point shall not impair the dielectric integrity of the switchgear. After the cable connections are made, all modifications shall be tested and commissioned in compliance with NECA 1000; as a minimum the modifications shall receive a megger test. A second connection method may consist of drilling the existing buses and attaching copper buses with appropriate fastening hardware and torque settings. The buses would extend upward (offsets may be required) to a top hat assembly. Insulators/bus supports may be required to support the buses and additional insulating material may be required. Each connection point shall not impair the dielectric integrity of the switchgear. After the cable connections are made, all modifications shall be tested and commissioned in compliance with NECA 1000; as a minimum the modifications shall receive a megger test. The bus is not to just be “drilled & tapped”. Shop drawings for the modifications shall be provided in accordance with the Submittals section.

43. I have the test data, but could you also please provide the LRKVA code of the motors and/or the actual LRKVA of the motors? (should be on the nameplates)

ANSWER: This information is not available.

44. We also have some concerns that 20% voltage dip may be too large and motor starting issues could occur. Has someone evaluated that the reduced torque that will occur at a 20% voltage dip will be sufficient to overcome the starting torque requirements of the pump load? (WK2 calculations)

ANSWER: The sufficiency of the reduced torque for pump starting loads has been evaluated. Six of the 1750HP motors were originally manufactured by E-M. Each E-M motor is connected to a pump manufactured by Fairbanks Morse. Information provided by E-M includes the WK2 value and speed-torque curve. The pumps curves for the Fairbanks Morse pumps show each pump is rated at approximately 1560 HP based on 87% efficiency. Based on typical pump curves for horizontal centrifugal pumps manufactured by Fairbanks Morse, the pump HP during starting is reduced to approximately 800HP when each pump is started against a closed discharge valve, which is the pump starting procedure. Since the motors are rated at 1750HP and the pump starting HP is about 800HP, the reduction in torque during starting with a 20% voltage dip should not prevent the pump and motor from reaching full speed. After the motor and pump reach full-speed, the discharge valve will begin to open and the pump load will increase to the running load of approximately 1560 HP.

45. Would you have the speed torque curve for the motor and pump load?

ANSWER: The attached speed-torque curve was obtained from E-M for the six motors and pumps manufactured by E-M and Fairbanks Morse. The speed-torque curves are calculated based on the original motor design by E-M. Speed-torque curves for other motors are not available.

46. In reviewing the Exhibit "E" there is reference to two 2000 HP pumps (3A and 3B). However, the generator specification section 2-2.01 performance table does not list any 2000 HP pumps in the load listing. Are the 2000 HP pumps going to be operated on emergency power?

ANSWER: The 2000 HP pumps will be operated on backup power. Add the following paragraph at the end of Specification 11910 Engine-Generators, Section 2-2.01:

> **"In addition to starting the load scenario listed above, the group of engine-generators shall satisfactorily start the following load scenario:**

	Load Description	Rating (hp)	Max Volt Dip	Comments
Step 1	**Radiator Cooling Fan Motor 1**	**75**	**20%**	**Full voltage starter**

Step 1	**Radiator Cooling Fan Motor 2**	**75**	**20%**	**Full voltage starter**
Step 1	**Radiator Cooling Fan Motor 3**	**75**	**20%**	**Full voltage starter**
Step 2	**Auxiliary Loads**	**301kVA**	**20%**	**0.8 power factor**
Step 3	**Essential Loads**	**609kVA**	**20%**	**0.8 power factor**
Step 3	**Vacuum Pump Motor**	**15**	**20%**	**Full voltage starter**
Step 3	**Battery Charger Station Motor**	**25**	**20%**	**Full voltage starter**
Step 3	**Dewater Pump Motor**	**40**	**20%**	**Full voltage starter**
Step 3	**Air Compressor**	**25**	**20%**	**Full voltage starter**
Step 4	**Synchronous Pump Motor 1**	**2000**	**20%**	**Full voltage starter**
Step 5	**Synchronous Pump Motor 2**	**1750**	**20%**	**Full voltage starter**
Step 6	**Synchronous Pump Motor 3**	**1750**	**20%**	**Full voltage starter”**