*"RE-BUILDING THE CITY'S WATER SYSTEMS FOR THE 21ST CENTURY"*

# *Sewerage & Water Board OF NEW ORLEANS*

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## Addendum No. _11__

## Date: 02/19/2024

Your reference is directed to **Contract Number:** 2023-SWB-97 (Contract 1420) for WPC Phase 1 Equipment Installation which is scheduled to open at **11:30 a.m. CST** on **February 23, 2024** for SWBNO Civil Engineering Department.

This addendum provides for the following:

1. Extension of Bid Due Date
    a. Bids are due on **March 1, 2024**, at 11:00 a.m. Any Bids received after the specified time will be rejected. Bids will then be publicly opened and read on **March 1, 2024**, at **11:30 a.m**. at Sewerage and Water Board of New Orleans, 625 St. Joseph Street, Purchasing Conference Room 131, New Orleans, Louisiana.

2. Responses to Questions.
    a. Attachment - 1420_BidderQuestions_Working (Page 2-19)

The above revisions shall be incorporated in and take precedence over any conflicting part of the original proposal documents. This addendum is hereby officially made a part of the referenced proposal.

Receipt of this addendum shall be acknowledged by inserting its number and date in the space provided in the Form of Proposal.

This addendum consists of nineteen (19) page.

*** END OF ADDENDUM ***

# C1420 - WPC Phase 1 Equipment Installation and Commissioning

**Questions and Responses during Bidding**

Response Version 0 dated December 20, 2023 included in Addendum 4: [Questions 1 - 7]
Response Version 1 dated January 02, 2024 included in Addendum 5: [Questions 8 - 20]
Response Version 2 dated January 17, 2024 included in Addendum 7: [Questions 21 - 59]
Response Version 3 dated February 05, 2024 included in Addendum 9: [Questions 60 - 83]
Response Version 4 dated February 19, 2024 included in Addendum 10: [Questions 84-146]

BIDDER QUESTION 84: Contract 1420 Bid Specifications include qualification requirements in the following sections:
26 50 71 Part 2.02(J)
40 94 23 Part 2.01(L)
40 94 24 Part 2.01(F)
Bid team evaluated the requirements and some points may exceed a single project experience by the design team. Bid team would like to submit attached qualifications to complete this scope using M S Benbow and Associates as design lead, with subcontractor QDS Systems, to complete these scope items. Please refer to attached qualifications and confirm if these entities will be sufficient to meet the qualification requirements of the contract.
**RESPONSE 84: Requests for deviation/substitution and approval of specific subcontractors and/or personnel must be submitted after contract award. Bidder is reminded that such requests must be for organizations or personnel that will be assigned to the project who have qualifications and experience that is equivalent to or exceeding that specified.**

BIDDER QUESTION 85: 26 00 10 1.04 Safety lights. Most of these lights are listed in this section and additional are shown in the plans we believe as PDCS-IND devices. Reference CWPENG-E-P-A4_50-80 showing one of these devices.
1. Please confirm these are the safety lights as IND is not listed in the Equipment Codes on the legend sheet.
2. Assuming these are the safety lights, the cable schedule shows 7 #14 and 2 #12 w/grd pulled to each of them. This wiring will only work for the sites that have a PDCS node installed. The following 8 sites do not have a PDCS node and will need data communications cabling from the PDCS network to new safety light IP controllers. CWPENG, CWPCC, CWPELS, CWPEMD, SSYRD, WPCAUX-T, WPCSTG-4, WPCCTG-5. Many of these have multiple light systems shown in the plans. Please confirm this is a correct interpretation of the project scope.
3. Calculating the electrical install cost for these 8 communications cables will require Jacobs to designate a network tie point for each cable.
**RESPONSE 85: [R85.1] Correct.**
**[R85.2] The preferred configuration of the Safety Lights is an networked addressable solution that may require external power. The referenced scheduled cables are for initial scoping basis and are dependent on the 1420 Contractor's submitted and approved solution. The preference of the networked addressable solution is to avoid the configuration limitations noted in the question.**
**[R85.3] The network tie point for all locations will be the same as the related PDCS equipment at that location. Of note, as answered elsewhere via Addendum, there is nolonger any 1420 scope in the CWPEMD area.**

BIDDER QUESTION 86: Drawing IC100 - this drawing shows a PDCS node in the Interim switchgear (WPCAUX-T) however it is not listed with SSCC and WPCAUX-0 nodes specifically outlined in 40 94 23 data sheets. IC506 shows a fiber optic cable pulled to it from WPCAUX-0.
1. Is this Interim Swgr PDCS node required?
2. If so, provide data sheets.
**RESPONSE 86: WPCAUX-T will be cabled back to the WPCAUX-0 building. IC100 will be corrected in the Conformed documents.**

BIDDER QUESTION 87: Drawing IC100 - this drawing shows Note 4 Equipment by owner for all equipment in WPCAUX-0. The data sheets above indicate a PDCS node is to be supplied.
1. Confirm a WPCAUX-0 PDCS node and everything else shown on this drawing in the Aux Elec room is to be provided and installed as part of the 1420 scope.
**RESPONSE 87: WPCAUX-0 PDCS noted is to be supplied as part of 1420. Fire panel is provided as part of a the 1427 Aux Elec Room (PDC1) scope not included in this bid. BOP PLC and security equipment are supplied as part of 1420.**

BIDDER QUESTION 88: Drawing IC100 - this drawing shows Note 3 for Turbine 7 indicating all will be provided by Owner.
1. Confirm Fire Panel is not required to be provided and installed in 1420 scope.
2. The supplier of this PDCS node indicates that the RTAC, HMI and SEL SDN switch they provided has not been programmed or tested to verify communications back to the T7 control system. Should this programming and testing with Solar be added to the 1420 scope?
3. The above checkout requires Solar's personnel onsite. Do we need to make an allowance in the scope to pay them for this service, or is that included in the 1438 contract?
4. The Volume 4 PDCS drawings provided indicate that a multimode transceiver was provided in the SDN switch rather than the 40K single mode required to tie into the existing PDCS system. Should correcting this be added to the 1420 scope?
**RESPONSE 88: 1. Fire panel is supplied as part of the 1438 Turbine 7 package.**
**[R88.2] Yes, assume the programming and testing of the 1438 Supplier supplied PDCS equipment should be included in the 1420 scope.**
**3. Solar startup support is not included in this scope and is provided as part of the turbine package.**
**[R88.4] Yes, the basis of design is single mode fiber.**

BIDDER QUESTION 89: Drawing IC100 - this drawing shows Note 4 for SFC-1 and SFC-2 indicating all will be provided by Owner.
1.Confirm Fire Panes are not required to be provided and installed in 1420 scope.
**RESPONSE 89: Fire panels are provided as part of the 1417 SFC package**

BIDDER QUESTION 90: Drawing IC100 - this drawing shows Note 6 requiring a KVM for monitors
1.Confirm KVM doesn't need to extend to the CEMS computer shown

**RESPONSE 90: There are three desks planned for the control room section of the Aux Electrical Room. Plan for desks to be arranged with 2 monitors on desk 1, 2 monitors on desk 2 and a single monitor on desk 3.**

BIDDER QUESTION 91: Drawing IC100 - this drawing shows Note 1 indicating computers to be provided by Owner
1.Confirm owner will provide each workstation shown with 1920x1080 monitors
2.PSS workstation computer and CEMS workstation computer are not indicated to be provided, but they are indicated to be provided elsewhere in specs. Confirm these will be provided by owner.
3.Confirm a Dell 440 Server will be provided by owner for the PSS server as shown in 40 95 33 and IC300.

**RESPONSE 91: Onlogic computers will be supplied by Owner. Monitors, keyboard, mouse will be provided by 1420 contractor. Dell 440 server will be provided by the Owner. Configuration and setup are by the 1420 contractor**

BIDDER QUESTION 92: Drawing IC100- A shared firewall is shown on this drawing on the IT LAN to allow logging between the PSS, PDCS and owners PI system.IC300 shows 2 independent firewalls being provided.
1.Is the owner providing one or two firewalls?
2.If one is supplied, where will it be placed on IC300?
**RESPONSE 92: Owner will provide two firewalls. Configuration is responsibility of 1420 contractor in consultation with Owners IT group. Firewalls are intended to be placed in the Aux Elec Room network cabinet**

BIDDER QUESTION 93: Drawing IC100 shows a NVR being supplied
1.Confirm this is to be provided and configured by the security vendor.
2.Indicate where it is to be mounted. It is not shown in the IC300, 301, 302 racks.
**RESPONSE 93: Video recorder is to be provided by 1420 contractor. Intent is to mount it in the panel on IC300.**

BIDDER QUESTION 94: Drawing IC100 shows a CEMS and T7 computer and monitor
1.Confirm CEMS computer and monitor will be provided by owner. CEMS vendor will provide all software, setup, configuration and testing of this system . All that is required in 1420 scope is to implement a network connection between the computer Owner supplies and the CEMS control system.
2.Confirm the printer shown on this drawing is the CEMS printer required to be provided by the CEMS vendor in Div 23 94 25.
3.Confirm T7 supplier will provide a computer, monitor, all software and checkout associated with this system. All that is required in 1420 scope is to implement a network connection between the computer they supply and the T7 control system.

**RESPONSE 94: 1. Owner will provide Onlogic computer for CEMS. 1438 T7 computer provided by the Turbine 7 vendor. 1420 contractor to supply monitor, keyboard and mouse for CEMS computer. Configuration of CEMS by 1420 Contractor.**
**2. Intent is for 1420 contractor to supply a 11x 17 color printer for shared network use within the Aux Elec Room.**
**3. Confirmed.**

BIDDER QUESTION 95: Drawing IC300 - A Dell 440 Server will be provided by owner for the PDCS server. To be compatible with the existing PDCS system, the Owner will need this server to be certified for and be shipped with VMWare ESXI in a version compatible with VMWare VCenter 7.0 and be supplied with (6) VMWare supported 1G NIC cards.
1.Confirm whether the owner will provide the above server as specified and will take responsibility for any compatibility issues that may develop with it or whether supplying it should be added to the 1420 scope.
**RESPONSE 95: [R95] The Owner will free-issue server hardware only. The 1420 Contractor is responsible for all software and configuration necessary for equipment integration as specified.**

BIDDER QUESTION 96: Drawing IC300 - The PDCS compartment indicates (2) ID 1 Cisco C9200L-24P-4X are being provided by the owner. These are not compatible with the existing PDCS network.
1.Confirm rack mount SEL SDN switches need to be supplied in the 1420 scope, as indicated in the PDCS ECS division 40 94 23.

**RESPONSE 96: Confirmed. SEL SDN switches to be supplied by 1420 contractor**

BIDDER QUESTION 97: Drawing IC300 - The PSS compartment indicates an SEL GPS clock is to be provided. The PDCS HMI Data Sheets show this is part of the PDCS system and the part number specified includes the IEEE518 PTP option. There is a clock of this type existing in the PDCS system installed at CWPCC without the PTP option. If it was intended to be a backup to the existing clock, it would be appropriately placed in the PDCS rack compartment.
1.Please advise how you intended this second clock to be used.
2.Please advise what time protocols you intend to have set up. Currently, NTP is setup on the PDCS network. IEEE518 PTP support can also be set up
3.Advise if you need the IEEE518 PTP option added to the existing clock
**RESPONSE 97: 1. Clock is intended to be a backup**
**2. NTP protocol should be used to be compatible with existing installation**
**3. Not required**

BIDDER QUESTION 98: 40 94 23 PDCS node Data Sheets - The data sheets indicate login is to be controlled by card reader security. The specification reads as if this is an independent system.
1.We are aware SWBNO is interested in reducing the admin requirements in all systems provided. The security vendor indicates they will be providing an access panel in the same room as existing and newly planned PDCS nodes. This is the card reader system SWBNO is familiar with that offers central administration for the entire facility. We proposed to wire a dry contact from each access panel to the PDCS node that closes when the security system indicates the card has login access. This solution adds no additional admin overhead for SWBNO. Confirm this is an acceptable solution for card reading auto login at the PDCS nodes.

**RESPONSE 98: [R98] The 1420 Contractor solution shall be reviewed per the Specification submittal review process during the execution of the WORK.**

BIDDER QUESTION 99: 40 94 23 PDCS node Data Sheets - Critical nodes. Nodes at SSCC and WPCAUX-0 are noted as critical. These have redundant switches and RTAC units. A second switch is being added at CWPCC and CWPENG. Non-critical nodes are currently configured in a plantwide fiber ring that can withstand a fiber pair break.

1.Which nodes new and existing are being designated as critical nodes?

2.How was it intended that these critical nodes be tied together through new and existing fiber? Please provide a layout diagram.

**RESPONSE 99: [R99.1] Only those noted in the Specification; CWPCC, CWPENG, SSCC, and WPCAUX-0.**

**[R99.2] The PDCS network will become a mesh network under the 1420 implementation. The redundant network switches shall be configured as Specified to provide critical node resiliency against a single hardware element failure.**

BIDDER QUESTION 100: 40 94 23 PDCS ECS - 2.01 C 1 “uninterrupted overall system operation upon failure of a redundant controller”.

1.A completely undetectable cutover when a failure occurs is not practical to achieve with RTACs that are both monitoring and controlling. RTACs can at best be setup for primary - primary redundancy, where both RTAC are fully communicating with each IED and are available for communication with each SEL data concentrator / SCADA interface. RTACs IP addresses can be swapped when a failure is detected. Communications to IEDs can only be from the active primary RTAC, however, so this needs to be switched when an RTAC failure is detected. Dependent upon the type of fault condition, the time to swap RTACs may be several seconds or longer. An RTAC can have not failed but if it’s communications path to a data concentrator fails, it has effectively failed. A heartbeat to the data concentrators can be implemented in the RTAC, but you can expect some delay in such a scheme before failure is detected and acted upon. Please advise if setting the system up in this way is adequate to meet your redundancy needs.

2.SSCC and WPCAUX-0 PDCS nodes each have one ethernet port per IED wired. With one IED connection, all IEDs will not be connected to each switch grouping. When a switch failure occurs, you will have partial connection to IEDs. All control algorithms will not remain functional in this scenario .The alternative is to have each IED equipped with 2 ethernet ports, one wired to each switch. Advise if you wish to add to the scope of 1420 the providing and wiring dual ethernet connections to IEDs at SSCC and WPCAUX-0.

**RESPONSE 100: [R100.1] The 1420 Contractor solution shall be reviewed per the Specification submittal review process during the execution of the WORK; in general terms the nature of the above described solution is consistent with the intent of the Specification.**

**[R100.2] Dual IED ethernet ports is the expectation at PDCS critical nodes to provide the functionality as described.**

BIDDER QUESTION 101: 40 94 23 PDCS node Data Sheets - The data sheets for WPCAUX-0 shows 2 fiber and 38 copper ports (WPCAUX-0) and 2 fiber and 26 copper (SSCC) are needed. These are both critical nodes requiring redundant switching, requiring a total of 80 ports (WPCAUX-0) and 56 ports (SSCC) (if dual IED ports are elected as offered above) . With a single connection per IED, 2 switches can provide the requested number of ports, but your IED control schemes will be crippled at best when a switch failure occurs. The switches will remain a single point of failure.
1.The specified SEL switch is a 12 port DIN rail mount unsuitable for this application. IC300 shows this as a rack mounted switch. Alternatively, SEL offers a 24 port 2741 rack mounted SDN switch similar to the existing 16 port SEL 2740S switches. To provide no single point of failure, a total of 4 switches and 4U of space is required to be allocated in the PDCS compartment for these switches on IC-300 (WPCAUX-0). Advise if this is acceptable and if a specific model number is to be provided.
2.A rack diagram equivalent to IC-300 is not provided for PDCS node SSCC. We presume these switches are to be mounted in the PDCS node cabinet. Confirm.

**RESPONSE 101: [R101.1] The basis of design is an SEL SDN ethernet switch, the specific model and configuration to meet the intent of the specified PDCS functionality shall be subject to the 1420 Contract submittal and review process. The above described configuration appears to be consistent with the intent of the Specification.**
**[R101.2] Correct, the PDCS node SEL SDN switch(es) are to be mounted in the PDCS node cabinet.**

BIDDER QUESTION 102: 40 94 24 - PSS HMI Para 1.01 B 7 and 3.09 Attachment 2 and 3 read that there is a requirement to replicate T7 turbine control graphics in the PSS, referencing attachments 2 and 3 that show the graphics and I/O implemented in the T7 HMI system. There are 30 graphic screens, a number of which are custom and not duplicatable in Ifix, and over 2000 tags. It would be a huge and costly effort to attempt replication of all T7 functionality in the PSS. Please provide a scope for what is to be displayed, controlled, alarmed, logged and historized from T7 to the PSS that is reasonably cost effective to implement.
**RESPONSE 102: Final scope will be agreed during graphics workshop. For purposes of this bid, assume 10 graphics and 500 points will be the maximum required.**

BIDDER QUESTION 103: 40 90 20 Instrumentation 1.03 15 thru 19 refer to equipment being provided that is not called out anywhere in the plans.
1.Advise if this is required and if so, provide enough detail to price.
2.Advise if 1.03 7 thru 12 removals are required.
**RESPONSE 103: Items 5-19 do not apply and will be removed**

BIDDER QUESTION 104: 40 91 00 2.04 E Lists a requirement for Automation Direct Productivity 2000 PLC with P2-550 CPU. Other suppliers shall be submitted to Owner for approval.
1.We ask that Allen Bradley Logix family controllers be approved for this project for use in the PSS and by package vendors.
2.If we are required to use Automation Direct, confirm you accept the list of exceptions to your specifications presented below.
Reasoning: If we provide the requested Automation Direct PLC, we will have to take exceptions in numerous portions of the specifications and give up considerable flexibility:
1.Reference 40 90 00 1.02 “The Process SCADA system is to use utility industrial grade equipment”. While Allen Bradley is commonly applied in utilities (SWBNO has been using them in T4 and T5 systems and T7 is all Allen Bradley) you will be hard pressed to find any applications of Automation Direct PLCs in mission critical utility applications like the one being implemented in 1420.
2.Analog input and output modules are required to be isolated. Automation Direct does not offer isolated analog modules. Allen Bradley offers isolated analog I/O.
3.2.06 I 1 and 2.11 H 1 requires 1G ethernet which is not available on Automation Direct PLCs. It is on Allen Bradley.
4.40 94 23 1.01 B4 and 2.01 A requires the PSS be IEEE 61850 compliant and use 61850 coms to the PDCS which is not available on Automation Direct PLCs. IEEE 61850 support is available on Allen Bradley PLCs..
5.If you choose to implement the preferred IEEE 1588 PTP support for time synchronization, Automation Direct PLCs are limited to NTP. Allen Bradley supports both protocols.
6.The architecture of the specified Automation Direct PLC limits it to one Ethernet port that can be used to connect it to other systems. The second Ethernet port on this processor can only be used for remote I/O. You can add a dozen ethernet ports to an Allen Bradley CLX, as was done on T7.
7.You are buying HART instruments, for which Allen Bradley has Hart analog I/O cards that can read detailed diagnostic information via HART. Automation Direct does not support HART.
8.The current RTAC implementation of Ethernet IP only works with Allen Bradley PLCs.
9.IAC, CEMS and pump skid vendors are typically either standardized on Allen Bradley or familiar with it; while they are not familiar with Automation Direct. Requiring them to supply Automation Direct is likely to cause no bid or a high price to cover the engineering time required to learn and convert to a platform that is not commonly requested.
10.Be aware Automation Direct is not a PLC manufacturer but a reseller that brand labels products like the specified PLC. You are much more likely to get a 50 year support life out of a US based manufacturer like Allen Bradley with a proven history of long term PLC support in this country.
11.2.05 B suggests that this PLC can fail and not impact point of service functionality because of HOA switches on the fuel pumps. If this PLC fails, PLC controlled pumps will shut off until you switch the local HOA to hand at the pump. You will be blind regarding what is happening in the fuel system and T7 at all configured PSS nodes. This PLC is the gateway for the PSS for everything that is happening in the WPC.. Someone will have to manually check fuel levels, switch pumps, and of course you will have no alarms.

**RESPONSE 104: 1. Specification will be revised to accept redundant Allen Bradley, Automation Direct or approved equal processors for the main BOP PLC. Non-critical systems may be Allen Bradley, Automation Direct or approved equal simplex processors.**
**2. See item 1.**
**3. See item 1**
**4. IEEE 61850 not required for PSS**
**5. NTP to be utilized to be consistent with existing plant installation.**
**6. See item 1.**
**7. Hart transmitters are required, but not Hart compatible I/O cards. Local handhelds will be used.**
**8. RTAC communicates on the PDCS, not the PSS network directly. Communication between PSS and PDCS will be via firewall.**
**9. IAC and CEMS or other equipment with highly standardized controllers may use their own controllers but Allen Bradley, Automation Direct or approved equal may be used. Fuel oil pump skids and other custom designed equipment may use Allen Bradley, Automation Direct or approved equal.**
**10. See item 1.**
**11. See item 1**

BIDDER QUESTION 105: 40 94 23 PDCS ECS 2.05 B Note that the T7 PDCS system has all breaker I/O wired to Axion IO and not to their respective IEDs, so in this system, IED operation is dependent upon the health of the RTAC.
1.Confirm that this is acceptable. The alternative is a significant reconfiguration that the owner would have to negotiate with Solar to maintain warranties.
**RESPONSE 105: [R105] The 1420 Contractor scope is limited to what is included in the 1420 Specification.**

BIDDER QUESTION 106: 40 94 23 PDCS ECS 2.06 A All ECS communications shall be managed by a common PDCS communications scheme. Be aware that:
-All PDCS nodes must be managed by the existing SDN flow controller
-Independent flow controllers are not supported by the manufacturer
-There Is considerable risk of PDCS service interruption in changing the flow controller on an in service system.
-Downtime should be kept to a minimum as existing RTACs depend upon the network to trigger a number of protective shutdowns in the existing system
-All network configuration will need to happen in the field - none can be done at FAT given the existing network and switches being built into multiple vendor systems.
1.Given the above, would you approve an additional week of engineering time to implement a two phase approach to network setup and integration that minimizes the possibility of upsetting the existing system?
**RESPONSE 106: [R106] The planning and execution of the WORK consistent with the Specification and networked electrical control system good practice is the responsibility of the Contractor and is an important part of the collaborative responsibilities of the Contractor's Construction Planner, Control System Integrator, Commissioning Agent/Authority, and Owner/Engineer.**

BIDDER QUESTION 107: 40 94 23 PDCS ECS 2.06 I 1 requires Ethernet IP communications at 1G speeds. The RTAC has a maximum Ethernet speed of 100M.
1.Confirm this is acceptable
**RESPONSE 107: [R107] The 1420 Contractor is expected to meet the specification with system specific configurations subject to the 1420 Contract submittal and review process, with the understanding that where best available hardware meets the intent of the specification.**

BIDDER QUESTION 108: 40 94 23 PDCS ECS 3.05 Training A. "Provide training so that the Owner can operate, maintain, change system configuration (including cybersecurity aspects of the system) , and repair the complete system."
-This wording is used throughout the specifications in the training sections of various divisions
-We are not aware that SWBNO or any other Louisiana municipality has the resources to hire people with the years of experience it would require to fully maintain all aspects of the systems involved in this contract.
-There is a provision to repeat training at the contractors expense if the Owner feels training is inadequate.
1.We are concerned the expectations of the Owner for training may be unrealistic based upon the wording of this section. Please reign in this training requirement so that it does not represent a substantial risk to bidders. Substantial risks get priced accordingly.

**RESPONSE 108: [R108] The training requirements within the Specification assume a base level of infrastructure understanding that is not within the scope of supply. The training requirements within the 1420 Contractor's scope are to provide implementation specific aspects of the systems installed and commissioned under the 1420 Scope.**

BIDDER QUESTION 109: 40 94 23 PSS Balance of Plant Control Systems 1.01 A "Interface to main SWBNO PSS to provide a full function system" and 1.01 G "this BOP PSS is a subsystem of the overall SWBNO PSS system". The only definitive interface found in this section is the requirement to send historical data from this system to an existing GE Historian and existing PI server. Interfaces with existing systems can be troublesome with GE Ifix as they have changed the database format limiting the ability to intercommunicate between current and older versions of the software.
1.Where else does what is displayed and controlled on the WPCAUX BOP Ifix system need to be displayed and or controlled? CWPCC? CWPENG?
2.For whatever remote locations are required, is there an existing Ifix node? If one does not exist, who will provide it?
3.If existing nodes need to be expanded, what version of the software and how many tags are left unused in existing licenses?
4.What version of Ifix is running on the Ifix historian and what are the remaining unused tags in the license?
5.Is the 1420 contract responsible for expanding licenses on either the GE Ifix or PI historians if that is needed (more tags or drivers for instance) ?
6.Is the Owner guaranteeing they will make access available to these historians at the firewall, including configuration of the firewall shown in IC100?

**RESPONSE 109: 1. Primarily the PSS BOP will be controlled at the WPCAUX-0 node. For contingency, an additional Controls node should be available at CWPCC. An engineering workstation will be configured in the CWPELS electric shop. Note that the system needs to be configured such that only 1 node (WPCAUX or CWPCC ) has exclusive control privileges at any given time to avoid conflicting signals. Command/Control transfer should also be by way of a 2-way 'handshake' (i.e. CWPCC node requests command, WPCAUX accepts request and transfers). Finally, any node with Controls privileges must follow relevant NIST 800-82R2 RMF standards detailed in Spec section 25 05 11. Engineering workstation at CPWELS should have view only access to operating screens.**
**2. Owner will provide Onlogic PC's for the locations listed above. Monitor, keyboard and mouse are the responsibility of the 1420 Contractor as well as the IFIX software and configuration.**
**3.Existing nodes that need upgrade when networks are ultimately integrated are responsibility of Owner.**
**4.1. Existing Historian is v2022.0 Enterprise. 9300/15000 tags are in use**
**5. If existing licenses are exceeded, this is the responsibility of the Owner to upgrade**
**6. Access to, and configuration of the historian and firewall will be done in collaboration with the IT/OT Cybersecurity teams to ensure functionality and compliance with our security framework.**

BIDDER QUESTION 110: 40 94 23 PSS Balance of Plant Control Systems - 1.01 B 1 link between PSS and PDCS
1.Will this link be configured by the Owner within the Owner-provided and configured firewall connecting these two systems? We see no other link on IC-100.

**RESPONSE 110: Firewall will be supplied by Owner. Configuration is by the 1420 contractor in consultation with Owners IT and Controls department.**

BIDDER QUESTION 111: 40 94 23 PSS Balance of Plant Control Systems - 1.01 B 4 Network switches shall be blocked by default. This is true of the SEL switches used in the PDCS; it is not true for the Cisco 9200 intent based networking switches specified for the PSS and provided by the Owner.
1.It is possible for the owner to configure 9200 switches to deny by default. Is that planned?
2.Deny by default can cause significant system issues if not set up correctly, and the PSS supplier will not have control of this setup. If SWBNO has plans to implement deny by exception in their PSS network, is it acceptable to prove the system without enabling deny by exception? Once accepted, SWBNO can then enable this functionality at their risk. Expect that if problems occur post substantial completion, vendors may ask that deny by exception be turned off to prove com problems are not due to blocking of data flows and ports that are needed.

**RESPONSE 111: Cisco switches will be supplied by Owner for the PSS. Configuration is by the 1420 contractor in consultation with Owners IT and Controls department. Cisco switches should be configured to be compliant with 25 05 11 Cyber security requirements**

BIDDER QUESTION 112: 40 94 23 PSS Balance of Plant Control Systems - 2.06 Data Links 2 Fuel Oil Forwarding Pump Control System. This is shown on IC700 to connect via a new fiber link to an existing PSS network switch in the Chem treatment building. From there the data is on the existing PSS ring to the Central Control room, where a new fiber optic cabling system is shown (48 and 24 strand indicating all 4 networks) between Central Control and the WPCAUX-0.
1.Since there is already a communications path being implemented between Central Control and WPCAUX-0 (the L4 Basin Loop being cut to splice in WPCAUX-0), what is the purpose of the Central Control to WPCAUX-0 cable run shown? How is it to be used in the PDCS, PSS, IT and Security networks? A layout drawing similar to IC-100 would be helpful.
**RESPONSE 112: Central Control to the Aux Elec Room and L4 Elec Room to Aux Electrical room fiber optic connections are intended to provide redundant pathways for the WPC area to communicate to the plant. Connection of the Bulk Fuel Oil Forwarding Pumps to the Chemical treatment building to connect into the main network is the closest path to get the pump data on the fiber optic network that will be ultimately patch to the WPCAUX-0 area.**

BIDDER QUESTION 113: 40 94 24 PDCS HMI - 2.02 A. “Each PDCS logical node shall be supplied with 1 HMI. The HMI shall be configured for local only PDCS controlled equipment operations and system wide status display.”
1.Existing PDCS node local HMIs are set up to monitor and control the equipment they are associated with only. Control is password protected. Does this “and system wide status” indicate that each local RTAC HMI should be able to monitor every other RTAC in the system? That would be expensive to implement and would grow impractical to scale. What is the intention here?

**RESPONSE 113: [R113] The intent is to display ‘system wide status’ that is impactful to the local node such that a local operator can make informed decisions around system configuration status, not the entire system. For basis of bid assume that status is limited generally to the next adjacent electrical distribution node or other identified content determined during the WORK limited to 50 non-local data points.**

BIDDER QUESTION 114: 40 94 24 PDCS HMI - 2.04 E. Local HMI trending all values in the control system.
1.Both the RTAC and PV7 HMI interfaces specified have limited ability to trend data compared to the central SCADA system. While they have access to log any point locally, you must select the specific points to be logged in advance and configure that into the application. Which tags are trended is not selectable by the operator.
**RESPONSE 114: [R114] Acknowledged and the details of the configuration should be expected to be resolved through the Concept of Operations (ConOps) Use Case process and/or graphics workshops.**

BIDDER QUESTION 115: 40 94 24 PDCS HMI - 2.06 C " Wonderware (Aveva) servers shall be virtualized with automatic failover functionality" D provides a license server. E provides a domain controller, F provides a historian. Currently there are two similar installations existing incorporating C thru F servers at the CWPCC and CWPENG control sites. These are not configured for auto failover but for complete and independent redundancy so that if a fire wiped out one of these locations, you could still operate from the other.
1.Please confirm that the same type of redundancy as is existing is what is preferred at the WPCAUX-0 location. That would include having the full capability to monitor and control the entire facility at WPCAUX-0 the same as at CWPCC and CWPENG. In effect, you will have a triple redundant system which is advisable while transitioning primary utility system control from CWPCC to the West Power Complex.

**RESPONSE 115: [R115] Correct, the intent is to have a fully redundant 'main control room node' configuration as exists at CWPCC and CWPENG to effectively provide the intent of 'failover' functionality without the complications of 'failover' configuration.**

BIDDER QUESTION 116: 40 94 24 PDCS HMI - 2.06 G "Virtualized Windows Terminal Server. Furnish to enable access to the HMI without programming." There are no such servers in the existing system. We can take your money, but this will be a virtual server that is virtually useless. Because the PDCS network is not tied to any external network including IT or PSS networks for security reasons (and terminal servers are notorious for being hackable) and because the PDCS network uses deny by default architecture, any connections to the terminal server would have to be preset in the flow controller to allow a user to access the terminal server, and the only workstations that are permitted on the PDCS network already have full access via a SCADA operator or engineering workstation. There is no one to serve.
1.Confirm this server can be deleted from the scope.

**RESPONSE 116: [R116] Please follow the specification requirements.**

BIDDER QUESTION 117: 40 94 24 PDCS HMI Supplement 2.01 D. This paragraph explains the requirement to provide the type of integrated RTAC HMI that is existing at SWBNO. There is a conflicting HMI Station data sheet in the 40 94 24.PDCS DS-1 that specifies a Rockwell Panelview. While both essentially do the same thing, there is more setup time, a separate configuration file and a separate programming software license required to maintain a Panelview. The administration for SWBNO of users and passwords is a bit more difficult for a Panelview as it must be done by physically going to each PDCS node panel, rather than doing it from a remote engineering workstation as you can with an RTAC.
1. Which HMI is preferred, or Is either HMI acceptable?

**RESPONSE 117: [R117] Panelview is the basis of design, an equivalent alternate can be submitted and evaluated during the execution of the WORK.**

BIDDER QUESTION 118: 40 94 24 PSS HMI 1.01 B 5 The Primary PSS HMI is in the WPSAUX-0 and the secondary is in CWPCC.
1.Is there an existing Ifix node at CWPCC? What Ifix version and how many tags does it have remaining available in its license?
2.If there is not an existing Ifix workstation at CWPCC, is one to be provided under the scope of 1420 contract? Please detail requirements.

**RESPONSE 118: There is not an existing HMI in the CWPCC. Owner will provide an Onlogic computer. Monitor, keyboard and mouse and configuration of the computer are the resposibility of the 1420 Contractor**

BIDDER QUESTION 119: 40 94 24 PSS HMI 2.02 B Histories. Provide an event history with circular buffer and 1 hour pre and post trip logs. This functionality is provided in the existing system within SEL IEDs and is accessed through SEL Quickset software via a virtual server and engineering workstations. It would not apply to the PSS SCADA server.
1.Please confirm this is acceptable.
**RESPONSE 119: IFIX historian to be configured for logging of points within the PSS and 1420 Contractor shall prepare first out trip logs within the limitations of the field hardware and communication links.**

BIDDER QUESTION 120: 40 94 24 PSS HMI 2.03 F Run time and development licenses for Ifix. These vary greatly in cost depending on the number of tags supported.
1.Is it acceptable to provide an adequate number of tags for the application or is there a specific license level the Owner requires to be provided for the WPCAUX-0 server?

**RESPONSE 120: Provide a license that supports the required number of tags for the application plus 20% additional.**

BIDDER QUESTION 121: 40 94 24 PSS HMI 2.05 A Config nd Programming of Servers and Workstation. 6 are listed. We can only find reference to WPCAUX-0 and CWPCC workstations and a WPCAUX-0 server in plans and specs.
1.Advise the total number and location of new workstations and servers to be provided, configured and programmed.
2.Advise the total number and location of existing workstations and servers to be modified to include the functionality of WPCAUX-0.
**RESPONSE 121: Owner provides Onlogic computers for the workstations. Monitors, keyboards and mice are by the 1420 Contractor. Owner provides the server. Configuration is by 1420 contractor. For the PSS, Operator Workstations at WPCAUX-0 and CWPCC are required. An Engineering Workstation located at the CWPELS Electric Shop is required. One Server is located in the WPCAUX-0 shown on IC300. A redundant server will be located in the CWPENG (Engineering Bldg) in the existing network cabinet located in the computer room.**

BIDDER QUESTION 122: 40 94 24 PSS HMI 2.07 License types and versions Ifix 5.9 or greater and Kepware IGS. The existing facility has Ifix versions dating back at least to 5.5. License versions may need adjustment due to compatibility with existing hardware or existing licenses, hardware and operating systems will need to be upgraded.
1.Please acknowledge this is an unknown at this time or provide version information on all existing licenses where workstations and servers need modification or historical logging.

**RESPONSE 122: Existing plant is actively utilizing verion 5.9. Migration to 2023 is planned. Any required upgrades to exising licenses or hardware will be responsibility of the Owner. As noted above if any license upgrades to the GE Proficy or PI Historian necessary to add additional points is the responsibility of the Owner.**

BIDDER QUESTION 123: 22 15 19 IACs 2.03 J 1 and 4 Provide local Automation Direct PLC and Ifix HMI. The listed air compressor manufacturers typically provide the required local functionality with built in controllers featuring touch screens for their own design optimized for the application, similar to what Siemens provided for their SFCs. These support Modbus TCP coms. The PLC and HMI specified if provided will not replace these controllers but be added on top of them, adding to cost and complexity.
1.Since there is a Modbus TCP connection planned to the PSS and intentions are that this IAC system be fully integrated into the PSS, is it acceptable to use the IAC standard controllers only at the IACs and provide the Ifix screens and integration desired as part of the PSS integration?

**RESPONSE 123: Air compressors and other equipment with highly specialized controllers may be supplied with vendor specific controls. Allen Bradley, Automation Direct, or approved equal PLC's are acceptable.**

BIDDER QUESTION 124: 23 12 13 Fuel Oil Transfer Equipment. There is no PLC panel required to be provided by the manufacturer for these two skids, although one is shown on IC-100.
1.Who is to provide a PLC for these skids?
2.Is one PLC acceptable, since these skids are mounted next to each other?
3.Is it acceptable to use remote I/O from the WPCAUX-0 BOP PLC?

**RESPONSE 124: The fuel oil forwarding pumps (23 13 13 33) are supplied with a PLC. The fuel oil transfer pumps (23 12 13) which sit next to the WPCAUX-0 building are wired to the WPCAUX-0 BOP PLC. IC-100 and IC700 and IC702 mistakenly mixed up the names. Note the PLC requirements are being revised to accept Allen Bradley, Automation Direct, or approved equal. (Reference item 104)**

BIDDER QUESTION 125: 23.12.13.13 Fuel Oil Forwarding Pump Skid 2.01 O 6 refers to redundant Modbus TCP fiber links and replication of local HMI screens on the Ifix BOP server in WPCAUX-0. E01-40 shows one fiber link.
1. Do we need to provide two active redundant Modbus TCP fiber links to this system, including single mode fiber converters at each end? If so, a switch will need to be provided in the local panel adding a single point of failure since the Automation Direct PLC specified only supports one Ethernet port for general communications.
2.Does this replication requirement imply that the pump skid vendor is required to provide a complete Ifix HMI node as was specified for the IAC or is some other type of HMI acceptable?
**RESPONSE 125: 1. No, only one fiber link is required.**

**2. Yes, contractor should include the iFIX HMI/SCADA Automation Software onto their Panel Mounted PC.**

**Note the PLC requirements are being revised to require Allen Bradley (Reference item 104)**

BIDDER QUESTION 126: 23 94 25 CEMS  Exceptions required to use an Automation Direct PLC:
2.04 I 5 e 1) Automation Direct does not offer modules with Form C relays. Allen Bradley does.
2.04 I 5 e 2) Automation Direct does not offer modules with isolated analog inputs. A/B does.
2.04 I 5 e 3) Automation Direct does not offer modules with isolated analog outputs. A/B does.
2.04 I 5 f 4) Automation Direct does not offer modules with isolated analog outputs. A/B does.
1.Please acknowledge these exceptions are acceptable or allow Allen Bradley PLCs

**RESPONSE 126: CEMS may be supplied with Allen Bradley, Automation Direct or approved equal**

BIDDER QUESTION 127: 23 94 25 CEMS  2.04 I 6 c 2 way backup storage for CEMS PC on another device.
1.Is it intended that data still be logged in the event of a PC failure and that when the PC operation is restored, data logged while the PC was down will backfill? Advise your overall goal for data backup on this system.
**RESPONSE 127: Intent was that CEMS PLC would pass the information to the IFIX historian as a backup .  Restoration to the CEMS PC is not required.**

BIDDER QUESTION 128: 23 94 25 CEMS  2.04 I 6 d PC and monitor requirements
1.Since the owner is supplying the CEMS PC and monitor, we presume these PC requirements apply to the owner. Please confirm.
**RESPONSE 128: The Owner will supply the PC.  Monitor, keyboard and mouse as well as PC configuration are the responsibility of the 1420 Contractor.**

BIDDER QUESTION 129: Drawing IC302 Half Size 4 compartment fiber cabinet. This is a duplicate of existing enclosures provided for the original fiber ring installation under 1370A. The maximum compartment space available in a half height rack divided into 4 spaces is 5U per compartment due to the divider plates.
1.The security compartment is shown with 6U of space used. That may be possible removing a divider plate, however that will impact security. Advise.
**RESPONSE 129: The battery pack may be moved to the IT compartment.**

BIDDER QUESTION 130: Drawing IC705 BOP PLC panel shows redundant Cat 6 connections and a fiber connection. IC303 shows this panel only has one PLC in it. The Automation Direct PLC specified supports only one general Ethernet connection.
1.Advise how these three connections are intended to be connected within the BOP panel.

**RESPONSE 130: As per item 104 above, specification will be revised to require redundant Allen Bradley, Automation Direct, or approved equal processors for the main BOP processor.  Connect the second switch to the redundant processor.**

BIDDER QUESTION 131: Drawing IC705 Under the DESK area of this drawing is shown PSS OWS-01 and PSS OWS-02. Only 1 workstation is shown on IC-100. This drawing is missing the T7 workstation provided under 1438 and the CEMS shown on IC-100.
1.Advise how many workstations/monitors the Owner is providing for the PSS at  WPCAUX-0 that will need to be configured and commissioned.
**RESPONSE 131: IC-100 is correct.  IC705 will be revised**

BIDDER QUESTION 132: Drawing IC709 Turbine Controller Media Converter, There is a 24 fiber cable shown between this media converter and the network cabinet. There is another shown to SFC1. We cannot find evidence of a Solar supplied media converter in the Vol 4 Solar drawings. There is a Prosoft Modbus TCP GW card in the Solar Allen Bradley PLC rack that offers a copper connection to the PSS. It appears the Solar provided remote HMI also has a dedicated copper ethernet connection.
1.Advise the purpose and places of termination of the 24 fiber cable between the turbine media converter and the CTG-7 Net Cab
2.Advise the purpose and places of termination of the 24 fiber cable between SFC1 and the CTG-7 Net Cab. Drawing IC700 shows SFC1 is tied via fiber to the WPCAUX-0 patch panel.

**RESPONSE 132: 1. 24 core connects to the PDCS switch in the building via the patch panel. 48 core is split between PSS, IT and Security portions of the patch panel. Connections shown on IC501 and 502.**
**2. A 24 coure and a 48 core cable are requrired between the WPCAUX-0 and the T7 enclosure as shown on IC700. IC709 will be revised.**

BIDDER QUESTION 133: 26 00 10 1.01 J 2 Claiborne SSCLA - add foreign device interface between PDCS and PWCLA PSS.
1.Please elaborate on the specific devices within the PSS to be tied into the PDCS
2.Are these devices to be monitored only or monitored and controlled?
3.If controlled, are they to be controlled by either the PSS or PDCS?

**RESPONSE 133: [R133.1] The intent is multifold but primarily; (1) to have better visibility in the PDCS of medium voltage distribution system loads and configuration in the medium voltage distribution system and (2) to structure a handshake between PSS and PDCS for medium voltage distribution configuration changes, medium voltage load addition(s), and medium voltage load reduction(s).**
**[R133.2] Monitored and controlled; these aspects will be worked out during the Concept of Operations Use Case development workshops.**
**[R133.3] It is expected to be a mix; these aspects will be worked out during the Concept of Operations Use Case development workshops.**

BIDDER QUESTION 134: 26 00 10 1.04 6 Safety light conditions controlled by either the PDCS or PSS.
1.Can you give an example of where the scope of work the PSS will be needed to trigger a safety light response in the PDCS?

**RESPONSE 134: [R134] A key Safety Light system purpose is local notification of safety impacting conditions. Safety impacting conditions include, but are not limited to, medium voltage switchgear and/or rotating equipment condition changes. The PDCS and PSS can effectuate these types of condition changes. An example would be at the Claiborne Pumping Station (PWCLA) and Claiborne Substation (SSCLA) where the PDCS closes/opens medium voltage switchgear circuit breakers and PSS starts/stops rotating equipment.**

BIDDER QUESTION 135: Panola Station - what are the PDCS requirements at this location? What PDCS node are IEDs at Panola to be tied to? What is the total number of IEDs to be tied in? Are suitable SEL IEDs existing or do they need to be provided and retrofitted into gear?

**RESPONSE 135: [R135.0] The intent is to integrate the 25Hz infrastructure at Panola Pumping Station (PWPAN) as an extension of the Sycamore Substation (SSSYC) PDCS node, much like the Claiborne Pumping Station (PWCLA) that integrates the 25Hz infrastructure into the Claiborne Substation (SSCLA) PDCS node.**
**[R135.1] Sycamore Substation (SSSYC) PDCS node.**
**[R135.2] Two is the basis of design, that work in tandem with the two 60Hz IED's in the Sycamore Substation.**
**[R135.3] The basis of design is that no additional hardware will be required, however it should be assumed that a firmware update of the Panola Pumping Station IEDs will be required and supplied by the 1420 Contractor.**

BIDDER QUESTION 136: 01 11 00 Summary of Work, PreBid Meeting Docs
Several pieces of major equipment indicate ready for delivery prior to construction commencement. Will the OEM / manufacturers hold these at their facility? Who is responsible for storage and PM? Including: CTG, XFMRs, Swgr, GSUs
**RESPONSE 136: Owner is responsible for storage/PM of this equipment and delivery to the site through its contracts with the OEM's. 1420 Contractor will take possession upon delivery as per the terms of the 1420 contract.**

**Note that the Contract 1440 Transformers (two total) as well as the Transformers provided with Contract 1417 (six total) will be stored at the Carrolton Water Treatment Plant (likely in the North East corner of the facility) and maintained by Others as per OEM requirements. 1420 Contractor will be responsible to take possession and move transformers to the final installation location.**

BIDDER QUESTION 137: Section 01 91 14 Equipment Testing, Commissioning and Facility Startup, Part 1.02 Commissioning Organization and Qualifications
Can the 01 91 14 part 1.02 requirements for Engineering Degree and Certified Commissioning Professionals for the Qualification of Commissioning Personnel be waived if the Commissioning Personnel have equivalent experience? The spec requirements will otherwise prohibit numerous qualified persons / entities.
**RESPONSE 137: Yes. Personnel with equivalent qualifications and experience to that specified would need to be submitted for deviation/substitution consideration.**

BIDDER QUESTION 138: Division 01 – General Requirements
Numerous specification sections refer to requirements to provide training on equipment and systems. Please confirm all equipment provided in contract packages other than CP1420 will have training provided by those vendors.
**RESPONSE 138: Refer to Specification 01 91 14 Supplement - Commissioning Register for a summary table indicating Supplier Scope of Supply and RFP Volume 4 for details. Contractor is expected to coordinate (through Owner) and integrate Supplier Training with Contractor provided training into a cohesive program.**

BIDDER QUESTION 139: Division 01 – 01 91 14
Specification section 01 91 14 contains several matrices for equipment commissioning registers and testing requirement registers. Several pages contain footers "DNU" and look to be duplications of other matrices. All the non-DNU matrices state a caveat they are for information only and it is the Contractor's responsibility to verify. In order to provide an accurate estimation, please provide clarity whether each piece of equipment provided via other contract packages will include testing services, training provisions, and startup services.
**RESPONSE 139: Volume 2 pages 343-356 of the pdf should be removed from the bid documents.**

**The tables included in Volume 2 pages 313-342 are intended to summarize the commissioning and testing requirements that are provided by the other contract packages. The 1420 Contractor is responsible to coordinate (through Owner) and oversee the testing and commissioning for the owner provided equipment.**

BIDDER QUESTION 140: Division 01 – 01 91 14
Specification section 01 91 14 contains pages for which the application is unclear: 01 91 14 Supplement 1 of 2 is the footer description for each (pages 345 and 347 in the original bid specification PDF). They appear to be extraneous pages. Confirm these are not applicable, otherwise please clarify their application.
**RESPONSE 140: Volume 2 pages 343-356 of the pdf should be removed from the bid documents.**

BIDDER QUESTION 141: Fuel Oil Forwarding Bid Package
Where Contractor is to cut and tie into existing fuel oil, there appears to be only one valve at the tanks. Confirm the Owner or their representative will make the first line break(s) and drain the lines.

**RESPONSE 141: Contractor to coordinate with Owner to schedule all service outages. Contractor is responsible to provide safe isolation/drainage and to make any/all modifications to the existing fuel oil line/valves.**

BIDDER QUESTION 142: General
Please confirm the following disciplines will be furnished, for Contractor use, conformed Engineer-of-Record / Issued For Construction drawings: piping, pipe supports, equipment location plans, structures (less shop detailing), concrete. Otherwise stated as: if not identified as delegated design, IFC drawings will be provided or the bid drawings may be used for construction and redlined for record. Noted shop drawings and other submittals will be provided as required.

**RESPONSE 142: Design documents provided in Volume 2 – Specifications and Volume 3 Drawings will be furnished as Conformed/Issued For Construction. Bid documents will not be used for Construction.**

BIDDER QUESTION 143: Supplementary Conditions 00 73 00, 6.03.E
Supplementary Conditions 00 73 00, 6.03.E requires all equipment to be furnished and components (except bearings) must be domestic production, manufacture, and assembly. This section also states the Board reserves the right to waive this requirement if in best interest. Please confirm materials will be accepted without domestic origin, less countries without trade agreements with the U.S., to allow economical pricing and availability.
**RESPONSE 143: Confirmed.**

BIDDER QUESTION 144: Existing Interface, East Transition Structure Area
CP1420 requires (3) bus duct entries for interface with SSCC near the East Transition Structure. Please provide details on this existing building. What is the design intent to secure and support the building and wall for penetration? Provide penetration details.
**RESPONSE 144: Final alignment of the busduct and location of penetration(s) through the wall are the responsibility of the 1420 Contractor. Details on the existing building will be provided to the successful bidder.**

BIDDER QUESTION 145: Existing Interface, East Transition Structure Area
CP1420 requires (3) bus duct entries for interface with SSCC near the East Transition Structure. Model views indicate there are structural interferences. Please provide a structural design and clarify the broader design intent to retrofit within the existing tower.
**RESPONSE 145: At the East Transition Structure, the 1420 Contractor is responsible for final sizing and placement of the electrical junction boxes and bus duct from the ETS to the SSCC. The 1420 contract includes field routed conduit from the existing conduit on the utility rack to the 1420-supplied junction boxes in the ETS. Of importance at this interface is the expansion and stress relief required in this interface.**

BIDDER QUESTION 146: Provide overall schedule, L2 or L3. Milestones and bar chart are provided in Summary of Work and pre-bid outlines.
**RESPONSE 146: Contractor is responsible for developing the detailed Project Schedule meeting the Contract Milestones provided in Specification 01 11 01 Section 1.03 Project Schedule Milestones.**