

## Request for Proposal CFTC 0001

### Questions and Answers:

1. RFP has rigid requirements for humidity control in the high bay area and yet specifies that this space is not to be air conditioned...this seems to be contradictory....are the humidity ranges listed correct? **Answer: Section 5, HVAC, is correct. Room Data Sheets erroneously identified the humidity requirements. Humidity can be as high as 100 percent.**
2. There is a flatness factor required for the high bay floor and at the same time a ¼” per foot slope to drain is required. Which should we design to? **Answer: The flatness factor always applies no matter whether on a level floor or sloping floor. The levelness factor only applies to a level floor (non-sloping).**
3. Where specifically are epoxy finishes required? **Answer: The Room Data Sheets identify the rooms requiring epoxy paint (Wet Chemistry Lab and Quality Control Lab)**
4. Reference 5.5.B.a, 5.8.A.3, 7.1.A,C, 7.6.2.t, and some of the rooms which have Hazard list and comments - Carbon fibers can be explosive and a health hazard. Does the process equipment fully contain the fibers, or does any area(s) require Hazardous Class III (or other Classification) equipment/fixtures (in particular, lighting, HVAC equipment, receptacles, etc.)? **Answer: Assume the process will contain the fibers and that no classified equipment will be required.**
5. **Reference Sections 5.10.A, 6.1.I, 8.E, 8.F, 8.5, 8.6.G, 8.8.C.** - The RFP mentions both Emergency Backup Generator and a Standby Backup Generator. The RFP requests that egress lighting be on *Emergency* Backup Generator, so if no emergency lighting units with battery backup are wanted, then there must be an Emergency Backup Generator for life safety. In the RFP, there are other HVAC items, security systems, etc., listed to be on *Standby* Backup Generator. Please clarify whether or not both types of generators are desired. Additionally, what equipment (besides egress lighting), is required to be on the Emergency Backup Generator, specified as a 450KW/562.5KVA 277Y/480V emergency generator? The RFP does state that the Generator shall be Class 24, Level 1, Type 10. This is an Emergency Backup Generator with a 24 hour run time; Level 1 means that it shall be installed when failure of equipment to perform could result in loss of human life or serious injuries, and start up within 10 seconds of power loss. This generator cannot be used for standby power unless a separate distribution system is provided for standby and Emergency Power. The basis for this request for clarification is further defined as follows:
  - System Types and Ratings: On-site power generation systems can be classified by type and generating equipment rating. The generating equipment is rated using standby, prime, and continuous ratings. The ratings definitions are important.
  - Emergency Systems: Required for public safety and mandated by law. Intended to provide power and lighting for short periods of time to permit safe evacuation of buildings, for life support and critical equipment for vulnerable people, or for critical communications systems and facilities used for public safety.

- Legally-Required Standby: Mandated by legal requirements for public safety. Intended to provide power and lighting for short periods of time where necessary to prevent hazards or to facilitate fire fighting operations.
  - Optional Standby: Intended where loss of power could cause an economic loss of business or revenue, interrupt a critical process, or cause an inconvenience or discomfort. Provide one generator to serve emergency and optional standby loads.  
**Answer: Provide one generator to serve emergency and optional standby loads. Provide emergency distribution as required by NFPA 70 to serve automatic transfer switches for emergency and optional standby loads. Assume a Stand-By rating. The split between emergency and standby loads is not known at this time. The standby load will need to be coordinated with the carbon fiber equipment vendor.**
6. The crane causes several issues with this facility, i.e. running electrical cable/cable tray, overhead piping, and electrification. With the carbon fibers, open electrical circuits will short out. If the crane is for future use, the crane girders could be installed now, but not the crane. Can the crane purchase and installation be deleted from the requirements? On other Carbon Fiber projects we have done, a crane is not required. **Answer: The crane is required and should not be a problem for the electrical circuits. Carbon-proofing of electrical equipment is relatively straightforward and the developers and subcontractors should know how to complete this requirement. Furthermore, negative pressure enclosures have been specified around all rolls that are the primary source of carbon dust in fiber production plants, and a small fraction of the amount of fiber produced in commercial scale plants will be produced. Therefore the amount of carbon dust to be generated is expected to be low in comparison to commercial plants.**
  7. Is there any information regarding current flow tests for both sites? **Answer: NAI will contact the City of OR for current flow test results.**
  8. Is the City of Oak Ridge going to extend the water, gas and sanitary sewer utilities to the property line? **Answer: Utility service is at Property boundary at Horizon Center parcels. At Heritage property, developer will extend the utility service a distance from existing service location. NAI to provide a map denoting current service locations..**
  9. There is a requirement for electronic door locks and access cards. As noted previously, this could create an issue with the carbon fibers shorting them out. Can this requirement be deleted? **Answer: The requirement cannot be deleted. Automated security is NOT optional. Most electronic locks and access card readers are outside the process space. Those that are in the process space need to be carbon-proofed.**
  10. There is a requirement to provide screening on all rooftop mechanical equipment. Can this requirement be deleted for production area exhaust fans? **Answer: Screening of rooftop equipment shall be at the developer's discretion. We will not require it for any rooftop equipment.**

11. **In the “Room Data Sheets” page 6 of 15, under “Additional comments”** for the Semi-Production Room, it states that the 400’x 72’ clear floor area will be a “no-fly zone”, and that it is to be “equipped with a crane that cannot be obstructed by building structure”. Does this mean that the crane hook should be accessible across the full 72’ width, or just that the bridge crane operation should not be obstructed within the 400’x 72’ area? If the hook should travel the full 72-foot width of the clear zone, the building will be approximately 6 feet wider, or approximately 78 feet to allow room for the crane rail and trolley assembly above. **Answer: The crane hook coverage may be slightly less than the full 72 ft. width. Standard offset of about 3 ft. is acceptable. Crane hook limits should not exceed 6 ft. from edge of space, preferably 4 ft. The building may be larger depending on the allowance for the crane rail and trolley assembly and the space needed for the utility headers and equipment along each side of the inside of the building..**
12. **Reference II.B.3.c of the Request for Proposal CFTC 0001** – Under the Technical Approach portion of the Evaluation Criteria section, it is stated for the building HVAC systems and equipment to plan to use 30 percent less energy than the minimum required in the latest edition of ASHRAE 90.1 (2007 in this case). When reading ASHRAE 90.1-2007 Section 2.3.c, it states that “The provisions of this standard do not apply to equipment and portions of building systems that use energy primarily to provide for industrial, manufacturing, or commercial processes.” However, following this guidance would eliminate the majority of HVAC equipment incorporated into the 30% energy savings criteria. Please verify whether it is the intent of the RFP to reduce energy used for all building HVAC systems (including production building ventilation, MCC/Control Room cooling, etc.) by 30%. **Answer: The energy consumption question applies to all HVAC systems and equipment. It does not apply to energy needed to operate production equipment. It would also apply to HVAC equipment that provides a ventilation function to support operation of the equipment or to prevent the release of hazardous production by-products.**
13. Question: General – Is there a preferred or required telecommunication provider for the Company at Heritage Center? Question: General – We understand that Verizon operates fiber optic service from DOE-owned telecom building at Heritage Center. In order to address costs, if Verizon will be the provider, please provide a designated point at which fiber service (duct bank or overhead) for this project may be connected. Question: Communications 9.9A on page 9-4 of 4 indicates a fully functioning PBX telephone system and telephones should be provided. Please provide specification and device quantities if the Seller is indeed to furnish a phone system. **Answer: Verizon is the preferred telecommunication service provider. The Company will provide the telephones which will connect to the Verizon system. A major fiber connection owned by DOE runs nearby the existing two spec building parcels A map denoting the location of the Heritage Center Telecommunication/Fiber connect node**

(Building K-1039 and 1039A) is attached. Major fiber connectivity through this node to the new spec building site could be completed at a cost.. [Please click here for map.](#)

14. There is a requirement for electronic door locks and access cards. As noted previously, this could create an issue with the carbon fibers shorting out. Can this requirement be deleted? **Answer: No -- we will still require electronic door locks and access cards.**
15. There is a requirement to provide screening on the rooftop mechanical equipment. Can this requirement be deleted for production area exhaust fans? **Answer: Screening of rooftop equipment shall be at the developers' discretion. We will not require it for any rooftop equipment.**
16. Part II Design Section 5.1.A.1 Production Area specifies no air conditioning. Section A-1 Room Data Sheet 2.1 (Semi-Production Area) specifies a space relative humidity of 30% - 55%. Since relative humidity control is typically not accomplished without air conditioning, is it the intent that there be no air conditioning and no humidity control in the Semi-Production Area? **Answer: See Question 1 above - The Design Criteria section 5 HVAC design parameters are correct. The Room Data Sheets erroneously identified the humidity. Humidity can be as high as 100%.**
17. Part II Design Section 5 specifies 30%-55% relative humidity in many areas. 30%-60% relative humidity is the common range for indoors at East Tennessee and is implied in 5.3.B.2a (55%  $\pm$ 5%). Is 30% - 60% acceptable design or is a maximum 55% rh required? **Answer: The relative Humidity requirements for conditioned spaces should be (30%-55%)  $\pm$  5%.**
18. Part II Design Section 5.3.C Mechanical Insulation references company specifications which are not included. Is it acceptable to insulate ducts and piping per ASHRAE 90.1-2007 with additional insulation per 10-CFR 434/435 if life cycled cost justified? **Answer: The type insulation should be as specified in Section 5.3.C. It is acceptable to use the R-values or conductivity of the insulation for ducts and HVAC piping in accordance with ASHRAE 90.1-2007 Section 6.4.4 and Tables 6.8.2A, 6.8.2B, and 6.8.3.**
19. Part II Design Section 5.3.D.2.4 Ductwork fire rated penetrations are required to be an engineering analysis per DOE-STD-1066-99 Appendix D which is not attached. Is it acceptable to instead use UL Listed penetrations? **Answer: If the UL rated duct penetrations meet the following criteria from DOE-STD-1066-99 they can be used: "fire dampers are not required in all cases when HVAC ducting penetrates fire rated construction." "...fire dampers are not required when ducts penetrate fire rated barriers that have a resistance rating less than 2 hours." "...requires 1 1/2-hour fire-rated dampers in ducts which penetrate fire barriers of 2 hours fire resistance or greater (but less than 3 hours)." "...requires 3-hour fire-rated dampers in ducts which penetrate barriers having a fire resistance of 3 hours or more." "Using the passing criteria defined in UL 555, researchers... have proposed equivalent protection of duct openings with no fire damper installed where the duct remains intact near the wall opening creating a barrier to flames passing through the opening at the end of a 2-hour fire test." "... the most important factors in maintaining the integrity of the ducting that prevents flaming**

through the duct opening after a one hour fire exposure is the quality of the duct construction and installation, a design which prevents gaps between the fire wall opening and the duct, and the design and protection of the duct hangers so that the ducts are supported throughout the fire period and hose stream test near the wall opening where the penetration occurs."

20. Part II Design Section 5.2 specifies ASHRAE 62 and 90.1 and references compliance throughout. Which year should be used as there are significant differences in these standards from 1999 thru 2007? **Answer: Use the current versions of all reference documents. If an earlier version of one of the references is preferred an exception request with appropriate justification can be submitted for approval by UT-Battelle, LLC.**
21. Part II Design Section 5.8.C.4 HEPA filtered systems are specified to be per Engineering Standard ES-5.16-1 and Appendix 5.3. Neither is provided. Can information on type of HEPA filter housing be provided? Is commercially available acceptable? **Answer: Commercially available HEPA filters and housings are acceptable for the applications requiring HEPA filters for this facility.**
22. Are phoenix controls (lab controls) required. Do we need to put isolation monitors to keep labs in negative pressure? **Answer: Controls and alarms shall be interlocked to maintain the required air balance between the hood interior and the room. Visual and audible alarm devices shall be installed to indicate malfunctions of either the hoods supply or exhaust air systems. Fans and isolation damper shall be controlled by the Building Management System (BMS). Phoenix Controls Laboratory Standards and Guidelines (Copyright 2002) adequately addresses these requirements.**
23. There was discussion about providing 3 options for utility hookups. We are expanding this question or electrical to the equipment plus mechanical and plumbing. For electrical, our options are buss way, cable trays, or underground. Are any of these options acceptable, is there a preferable option, and if so what is it. Do we have the ability to provide a utility rack approximately ten foot off the floor for both electrical and mechanical service down both sides of the building, with piping underneath? **Answer: All a part of the A-E Design process ---TBD--- as long as there is clear unobstructed space for the Crane hook to travel in all directions. Buss way is not recommended. Future coordination with the equipment vendor will likely reveal that individual circuits from the vendor's control system to specific equipment will be required.**
24. How are electrical utilities going to feed the building? Can we do a loop feed for the high voltage transformer? **Answer: Question is too vague, but likely needs to be addressed to the local utility. Please be more specific. A loop feed primary is acceptable (loop feed infers that two primary feeders are available and each feeder is capable of serving all three unit substations).**
25. Please clarify that the motor control system will be provided by the electrical contractor? **Answer: The motor control system for the carbon fiber process line will be provided by the vendor. Motor control for equipment other than the process line (i.e. mechanical systems) is to be provided by the seller or developer.**

26. How do you recommend that the utilities (electrical/mechanical) cross over to the opposite side of the building? **Answer: What is critical is providing clear space for the Crane hook otherwise either by routing across the end wall, over the top of the crane attached to the ceiling or in a trench in the floor - - - all depending on where the mechanical/electrical equipment source is located, etc. and all a part of the A-E Design process. Routing over crane and attaching to the ceiling would be the least desirable.**
27. Will this building require any specialty gas monitoring? (i.e. CO<sub>2</sub>, CO, O<sub>2</sub>, etc.) **Answer: The gases used or generated in the production equipment are confined and removed by dedicated exhaust systems. The ventilation rate of 7.5 air changes per hour will dilute and remove any gases that may leak from the process equipment. Therefore, no specialty gas monitoring of the building is required.**
28. Will we have access to air lines in case pneumatic control valves are required? **Answer: Yes. See Section 6.4.G.7 of the Design Requirements. Compressor to be provided and included in Facility Design.**
29. Is plenum-rated control cabling acceptable in office areas? Or will those areas require EMT? **Answer: Don't anticipate control cable in office areas. Control cable in control rooms may be plenum rated, but will require a cable management system (cable tray).**
30. The FPE manual indicates that DOE requires an FHA (Fire Hazards Analysis) for all DOE facilities. The DOE typical objectives are as follows:
1. Minimizing the potential for the occurrence of fire.
  2. No release of radiological or other hazardous material.
  3. An acceptable degree of life safety to be provided for DOE and contractor personnel and no undue hazards to the public from fire.
  4. Critical process control or safety systems that are not damaged by fire.
  5. Vital programs that are not delayed by fire.
  6. Property damage that does not exceed acceptable levels (\$150 million per incident).
- The FHA could include the computer modeling of a worst case fire. The same is true for an evacuation model.

There is a fire protection engineering task noted in the RFP Section 7 that we would like to confirm as it appears extensive for a privately developed project.

Please confirm the required level of deliverables and content of an FHA for the CFTC commercial facility. **Answer: The ORNL FPE will be writing the Design FHA for the Facility.**

31. Paragraph 6.1.D states the piped services from the utility headers are the responsibility of the independent suppliers. Does this mean the sellers of the CFSL and the MSPL systems furnish and install this piping and the pipe supports? **Answer: The piped services from the utility header termination points at the start of the branch line feeds to the associated equipment will be designed and/or furnished by either the process equipment suppliers or contractors engaged to install the equipment.**
32. Paragraph 6.1.D states flow meters, and pressure and temperature gauges will be installed at selected locations to verify piped system performance complies with

operating requirements. Who provides these-the Developer or the Sellers of the systems? If the Developer provides them please provide a specification on the type of meters and identify the utility systems they are required for. **Answer: The Developer will specify and provide these devices on the system headers and at each branch line feed to verify piped system performance complies with operating requirements. The specification of these devices is TBD based of the Design Phase -- Operating Requirements. These devices are required for all utility systems depending on each systems operating parameters.**

33. Paragraph 6.1.M states compressed is to be provided at 100 psi and a dew point of 40 degrees F; it also states two compressors are to be provided sized for 50% of the total demand of 825 cfm. This criteria is contradicted by paragraph 6.4.G which states compressed air is to be provided at 100 psi and a dew point of -50 to -70 degrees; it also states compressors receiver's driers and filters are to be 100% redundant. Which criteria applies to this project? **Answer: Paragraph 6.1.M is project specific criteria as stated. Paragraph 6.4.G is general criteria whereby 6.4.G.7 indicates that compressed air may be provided by a dedicated 100% redundant oil-free compressor(s), etc. This statement is worded with "may" instead of "shall". Therefore for cost purposes plan on two compressors sized for 100% of the total demand. During the Design Phase the compressor(s) size and redundancy will be established. As far as dew point, section 6.4.G.5 is applicable comparison to the specific project criteria of 6.1.M, instead of 6.4.G.2.**
34. Paragraph 7.4.B.19 refers to three mezzanines within the building. Is this applicable to this project? **Answer: One mezzanine is to be provided by the Developer and the other two mezzanines are to be supplied and installed by the equipment manufacturer. All three mezzanines are to be "sprinklered" by the building Developer.**
35. Paragraph 6.4.B.1.g requires the water to be a looped grid type system to provide alternate water flow paths to any point in the system. Is this applicable to this project? **Answer: Paragraph 6.4B.1.g is applicable to this project.**
36. Section 8-Electrical. Will any equipment provided by the sellers of the CFSL and MSPL systems need to be powered by a motor control center? If so does the Seller or Company furnish and install the MCC? **Answer: The Seller will furnish and install the MCC for the production systems and equipment.**
37. Need Clarifications on mezzanines how many are required. Please clarify if there are one, two or three mezzanines required as part of the building. See following references from RFP and equipment specification.
- a. Fire Protection section 7-6-11 states - There will be a minimum of three mezzanines within the building. The sizes of the mezzanines are: two at 500 sq ft. and one at 1000 sq ft. The exact location has not been determined. The sprinkler contractor shall interface and coordinate with ORNL to determine the placement of said mezzanines.

- b. Equipment specification section 3.3.1.2 Baled Tow Feed Station and Equipment specification section 3.3.7.2 Bulk Packaging Station both speak of mezzanines. **Answer: See Item # 34.**
38. If part of building scope will either require forklift access (elevator). If elevator(s) are required, what is the required size and capacity? **Answer: Elevator(s) are not required. Forklift size TBD during the Design Phase.**
39. Only clearly defined space in the room data sheets is the one detailed mezzanine 2.4 Packaging and Storage (500 sf space) and requires forklift access what is the required size and capacity of elevator? **Answer: See Item # 38.**
40. Master **Design Requirements Section 8.4/B Medium Voltage Transformers item 2** reads – Transformers are identified as Dry Type with fan cooling, ONAN/ONAF/OFAF. The “O” indicated Oil ratings, dry type transformer ratings are AA/AF. Please clarify type of transformers to be used Medium Voltage Transformers. **Answer: Oil Type.**
41. **Carbon Fiber Tech Center Design Requirements Low voltage Substation Section 8 8.2 Specific Requirements – Items A, B & C** amp ratings do not include the transformer top fan capacity. **Answer: Clarification – when section 8.4 mentions that transformers shall be specified with ONAN/ONAF/OFAF ratings, it means that if the engineer decides to use a transformer with forced air or forced oil it merely needs to be specified that way. The top capacity of the transformer (if forced air or forced air is provided) shall be as required in section 8.2 (2000kva, 1500kva, 1500kva for substation 1, 2, and 3 respectively).**
42. **Substation breaker Provisions indentified in RFP Electrical Page 8-1 Item 8.2 Specific Requirements B.** Substation #1, C. Substation #2 & D. Substation #3, are the provisions for future or are they present loads only? **Answer: As described, the transformers and switchboards are sized to serve future loads.**