Project Management Guide for Lessees

At The
Wyoming Integrated Test Center

Last update: January 2024

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1. GENERAL

The Integrated Test Center (ITC) is a test facility located within the Basin Electric Dry Fork Power Station (DFS) in Gillette, WY. The operations of this facility are currently funded by the State of Wyoming, Basin Electric Power Cooperative (BPEC), Tri-State Generation & Transmission, and the National Rural Electric Cooperatives Association (NRECA). The facility specializes in the testing of technologies associated with post-combustion carbon capture. The ITC is equipped with six small test bays (~0.4 MWe) and one large test bay (~20 MWe), accommodating multiple third-party technologies simultaneously, providing cleaned postcombustion flue gas for extended periods at a base loaded power station. Occasionally,however, unexpected forced outages do occur due to equipment maintenance requirements. The post-combustion test facility uses flue gas from a commercially dispatched base-loaded 422-MW coal-fired boiler located at DFS, owned by Basin Electric Power Cooperative (BEPC) and Wyoming Municipal Power Agency (WMPA). DFS is operated by BEPC.

Our primary goal is to enable successful testing of new technologies while maintaining the proper safety and quality standards. This document will serve as a guide to technology developers on best practices for projects installed at the ITC. It should be used as a guide to assist lessees in understanding the available site resources, applicable design criteria, and operational procedures for the site.

1.1.Scope

This document governs the project criteria for projects installed, tested, and decommissioned at the ITC. After review of this document, questions or clarifications should be referred to the ITC: will@wyomingitc.org.

2. CODES AND STANDARDS

The design and specification of all equipment furnished to the site shall be in accordance with applicable federal, state, and local laws and regulations. Applicable codes and standards shall be used for design and construction of all equipment that will be used by the lessee at the ITC. We acknowledge that there are a wide range of processes for CO_2 capture and CO_2 utilization technologies **under development. The applicability of codes and standards will be dictated by the process and system design for a specific project. A list of potentially applicable codes includes, but is not limited to:**

AGA American Gas Association

ASCE American Society of Civil Engineers

- ASCE 7-02 Minimum Design Loads for Buildings and Other Structures

ASME American Society of Mechanical Engineers

- Section II, Material Specification
- Section V, Nondestructive Examination
- Section VIII, Div. I, Pressure Vessel
    - Section VIII, Div. II may be used with site approval
- Section IX, Welding and Brazing Qualifications
- B31.1, Power Piping
- B31.3, Process Piping

ANSI American National Standards Institute

- B2.1, Pipe Threads
- B16.5, Steel Pipe Flanges and Flanged Fittings
- B16.9, Factory-Made Wrought Butt Welding Fittings
- B16.11, Forged Fittings, Socket-Welding and Threaded
- B16.25, Buttwelding Ends
- B16.34, Valves – Flanged, Threaded, and Welding End
- Shell and Tube heat exchangers shall be designed and manufactured in accordance with ANSI/API standard 660 eighth edition and ASME Section VIII Div 1.
- Plate and Frame heat exchangers shall be designed* and manufactured* in accordance with ANSI/API standard 662 first edition and ASME Section VIII Div 1.
- Z358.1 Safety Equipment Fixtures & Installation

AWS American Welding Society

- D1.1, Structural Steel Welding Code

API American Petroleum Institute

- API 520, Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries
- API 521 – Pressure-relieving and Depressuring Systems
- API 500, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division I and Division 2
- API 550, Process Measurement Instrumentation

AISC American Institute of Steel Construction

- AISC 303 - Code of Standard Practice for Steel Buildings and Bridges
- AISC 316 - Manual of Steel Construction, 9th Edition
- AISC 317 - Manual of Steel Construction, Vol. II: Connections
- AISC 326 - Detailing for Steel Construction
- AISC 335 - Supplement No. 1 to the Specifications for Structural Steel Buildings

ASnT American Society for Nondestructive Testing Inc.

ASTM American Society for Testing and Materials

- Annual ASTM Standards

EIA Electronic Industry Association

IEEE Institute of Electrical and Electronics Engineers

ISA The International Society of Automation

RCSC Research Council on Structural Connections

AGMA American Gear Manufacturers Association

NEMA National Electrical Manufacturers Association Standards

NFPA National Fire Protection Association National Fire Code

- **NFPA 70E Standard for Electrical Safety in the Workplace**
- **NFPA 70 National Electric Code (NEC)**

HI Hydraulic Institute Standards

IEEE Institute of Electrical & Electronics Engineers Standards

ISA International Society of Automation

IBC International Building Code (Latest revision in force on the date of the contract**)**

SAMA Scientific Apparatus Makers Association

SSPC Steel Structures Painting Council Standards

FM Factory Mutual Engineering Corporation Handbook of Industrial Loss Prevention

OSHA Occupational Safety and Health Administration Standards

UL Underwriters' Laboratories

Any other applicable codes and standards from associations or organizations not listed above shall also apply and be utilized as required when not in conflict with the above listed codes and standards.

Omission of any codes or standards does not relieve the Lessee of the responsibility to follow all applicable codes and standards for their particular project.

Should codes or standards be revised after the issue of this specification, the lessee should inform the ITC immediately upon receipt of such information. Before adoption of any subsequent issue or case ruling, the lessee shall discuss the effect of these requirements with the ITC and proceed with material and/or fabrication changes only after receipt of the ITC's written approval. In the event of overlapping code requirements, the more stringent code requirement shall be required.

3. SITE DATA

3.1. General

	Unit	Value
Location		Gillette, WY
Elevation Above Sea Level	M (ft)	1,295 (4,249)

3.2. Environmental

3.2.1. Wind

	Unit	Value
Maximum Wind Velocity at Ground Level	m/s (miles/hr)	40.2 (90)

3.2.2. Ambient Air

	Unit	Value
Maximum Temperature	°C (F)	37 (99)
Minimum Temperature	°C (F)	-40 (-40)
Yearly Average Temperature	°C (F)	7 (46.3)

Average Pressure	kPa abs	87

3.2.3. Air Humidity

Humidity	**Unit**	**Value**
Relative Humidity	%	18% - 63%

3.2.4. Rainfall

	Unit	**Value**
Yearly Average	mm (in)	430 (16.9)
Maximum monthly Average	mm (in)	80 (3.15) – May

3.2.5. Snow Load

	Unit	**Value**
Snowfall – September to May	mm (in)	150 (59)
Note: 2009 IBC Ground Snow Fall = 10 lb/sqft = 49 kg/m^2		

4. SITE ACCESS

In order to ensure the safety and security of all personnel at the ITC, all visitors must supply the information below before arriving at the plant site. Further information regarding site access and working on site may be found in the “Lessee Safety and Environmental Manual.”

4.1. Initial Site Access

Prior to an initial visit to the site visitors should supply the following information for each visitor that will be in attendance:

For U.S. Citizens – First and Last Name, Company Name

For Citizens of other countries – First and Last Name, Company Name, Country of Citizenship, Name of Home Town

At the request of facility managers or badged ITC personnel, visitors should provide at least one form of identification upon visit to site. Acceptable forms of identification are an unexpired, "official" state or federal identification credential, which includes the individual's picture such as a driver's license or passport. Visitors will be 100% escorted by badged ITC personnel.

4.2. Working on Site

Lessees with employees or contractors working at the ITC will follow the process described below to obtain independent (badged) access to the ITC.

A summary of the screening process is:

- Prior to a lessee beginning any work on site, the ITC tenant lease must be finalized.
- Identify the lessee's safety coordinator.
- Provide the ITC with the individual's information as described in section 4.1.
- Complete site safety orientation (provided by the ITC).
- The lessee must have a drug-screening process.
- Access badges are issued to individuals and cannot be shared. Any person without an access badge (a visitor) must be 100% escorted by badged personnel.

5. TEST FACILITIES

The flue-gas slip-stream is taken downstream of the scrubber, providing approximately 20 MWe of flue gas to the ITC. The ITC site has two flue gas induced draft fans. The first provides approximately 20 MWe of flue gas to the Large Test Center Bay(s) (LTC). The second supports six pilot bays and has a 0.4MWe capacity per bay. The site layout is provided in the attached ITC general arrangement drawing.

6. UTILITIES

6.1. Electricity

- Powder River Energy Corporation (PRECorp) is the electric service provider. It is the responsibility of the lessee to secure the service for each individual test site.
- Large Test Center (LTC): 480V, 3W, “Y”, 3000 kVA transformer
- Small Test Centers (STC) (each): 480V, 3W, “Y”, 750 kVA transformer
- STC (A-E): 480V, 3W, 125A, “Y” (in addition to the 750KVA service)
- Note these are three wire electric services, there is no neutral (277V) available.

6.2. Domestic Water

- Domestic (potable) water is available at the bathrooms and media center (ITC office). Domestic water is available at specific locations test bays for office trailers and sanitary facilities only.

6.3. Process Water

- STC (A-E): 10 gpm, 80 psig, 2” hydrant connection.
- STC (KHI): 130 gpm at 80psig, 4” connection.
- LTC: 300 gpm, 80psi, 6” hydrant connection.

6.4. Waste Water

- STC (A-E): no waste water return is available. All waste must be tanked and hauled off-site.
- STC (F): 4” connection.
- LTC: 6” connection.
- STC F and LTC: Waste water must be pumped to a sump located at DFS. Waste water composition must first be analyzed before being accepted by DFS.

6.5. Communications

- Ethernet and phone are available at the ITC media center (office).
- Wireless Ethernet is available at each test site. Each tenant has a secure and separate network. Tenants with large bandwidth such as cloud data storage, high resolution security cameras, and certain remote operation requirements will likely need to arrange for their own ISP to guarantee their bandwidth requirements.
- DFS hand held radios (primarily for emergency/safety use).

6.6. Office Space

- Office space and basic office amenities (printer, video conferencing equipment) are available at the ITC media center (office).

6.7. Utilities not provided

- Compressed Air.
- Instrument Air.
- Natural gas (potential for future availability of natural gas).
- Propane.
- Cellular phone service is **limited.**

7. Flue Gas

- A Guillotine damper for the Large Test Center and butterfly valve for the Small Test Center will allow for gas to flow, both are controlled by the DFS Distributed Control System (DCS).
- Flue gas flow rate is not measured for individual test sites. (Total flue gas flow to the entire LTC and STC is available).
- LTC: ~23 MWe, ~59,000 scfm @ 10-15 in. wc (gauge), 48" square duct connection.
- STC: ~0.4 MWe, 900 scfm @ 15 in. wc (gauge), 8" connection.

7.1. Flue Gas Supply

Flue gas is supplied to the lessee with the following approximate composition for normal coal derived flue gas:

Component	Minimum	Maximum	Average
CO2	12%	13.1%	12.7%
O2	1.7%	4.2%	2.5%
N2 + Ar	65.7%	69.7%	66.7%
H2O	15.2%	18.3%	18.1%
SO_2	0.0 ppm	114.9 ppm	23.1 ppm
NO_x	19.2 ppm	38.4 ppm	27.8 ppm
Temperature (1)	177 F (81 C)	194 F (90 C)	185 F (85 C)

8. DESIGN REQUIREMENTS

The scope of this section is to provide suggestions on commonly overlooked design requirements for projects at the ITC. It is not an exhaustive list of all design requirements. Test partners should review this information and discuss any design questions with the ITC Site Operating Contractor.

8.1. Skid Arrangement

The arrangement of the ITC test areas is conducive to modular or skid-mounted equipment installations. As a general rule, it is preferred that the equipment be contained within a modularized skid. If multiple modules are required to house a lessee's equipment, skids should be as few in number as possible. This limits the amount of interconnecting wiring and piping to be installed on site. Vendor skids should be designed for portability and should include adequate lifting features for the installation (lifting lugs, fork truck access, etc.). The location of installation will determine which methods of installation may be used and this should be discussed as part of the work plan prior to the skid design. Excessively heavy units (> 50,000 lbs) or units which require two cranes will require a lift plan stamped by an engineer registered in the state of Wyoming. This is the responsibility of the lessee. This should be discussed at the earliest possible opportunity.

It is recommended that skids should be designed for outdoor duty and the ambient conditions for the plant site as detailed in section 3.0 of this document. The lessee may erect a temporary building or other appropriate covering at their expense.

In order to receive and ~~off load~~ offload heavy freight, lessees shall utilize approved contractors (at the lessees' expense) and coordinate with the ITC.

8.2. Design and Operating Conditions

One of the primary criteria to be determined by the lessee during the preliminary process flow design is the design and operating conditions of the vendor's systems. The ITC typically determines the design conditions for a system by designing for the maximum pressure that could be seen during a potential process upset as well as the maximum temperature that the system could be exposed to during an upset (even if the maximum pressure and temperature are non-coincidental). An example of this may be:

Normal Operating Conditions: 15'' H2O @ 185 F
High Pressure Upset Condition: 30'' H2O @ 185 F
High Temperature Upset Condition: 15'' H2O @ 350 F
Resulting Design Conditions for all components: 30'' H2O @350 F

In the example above, the values indicate the worst case expected pressure and temperature at non-coincidental conditions. Using these conditions simultaneously yields a more conservative design. It is recommended that lessee use a similar philosophy for determining their design conditions.

Once the design conditions of the vendor skid have been determined, the existing ITC over-pressure and over-temperature controls in the area of installation can be evaluated to determine if they provide adequate safeguards for the vendor skid. If not, additional over-pressure and/or over-temperature safeguards may be required. As this can cause substantial design and layout work, it is recommended that this evaluation be conducted as early in the design process as possible. A preliminary Process Hazard Analysis (PHA) is likely the most effective method of evaluating design conditions and system safeguards. This is discussed in further detail in Section * MERGEFORMAT 9 of this document.

8.3. Process Piping

All piping within vendor skids should be designed, fabricated, installed, tested, and inspected in accordance with ASME B31.1, or B31.3, whichever is applicable.

8.4. Pressure Vessels

Compliance with ASME Section VIII Boiler and Pressure Vessel Code is a site requirement and should be considered in the design and engineering of the vessel. Any pressure vessel not meeting code exemptions as outlined in section U-1 of the code are required to carry an ASME Code Stamp. As best practice, BEPC requests a copy of the vessel code calculations and U-1 report.

For many vendor tests conducted at the ITC, the small scale of testing often allows vendor vessels to meet the small size exemptions of the code as outlined in U-1(c)(2)(i), in which case a code stamp is not required. Even if a vessel is determined to be exempt, BEPC believes that following the intent and requirements of the code for the design of exempt vessels is an engineering best practice and requests that a full set of code calculations be performed by an engineer who is experienced in pressure vessel design. The drawings, design, and calculations **should be submitted to BEPC for review prior to fabrication of the vessel**. The test partner is also required to solicit a fabricator who is experienced in the fabrication of pressure vessels. The fabricator's name and credentials must be supplied to BEPC prior to fabrication as well.

8.5. Overpressure Protection

System overpressure scenarios for vendor skids should be evaluated during the design phase to determine where additional overpressure protection may be required. This evaluation should be completed by a competent engineer who is familiar with and experienced in the design, sizing, and selection of pressure relief devices. For each system or vessel, an analysis should be completed to identify all potential sources of overpressure as outlined in API 521. Once all valid sources of overpressure have been determined, appropriate overpressure protection should be included in the system design.

When designing and selecting pressure relief devices, calculations of the relieving rate and proper valve sizing should be performed by the test partner's qualified engineer. BEPC requests copies of all PSV sizing calculations performed by the test partner.

In some cases, a system can claim to be protected from overpressure "by design," meaning that the system is designed to withstand a higher pressure than can be introduced. Such a vessel can be exempt from the installation of a mechanical overpressure device, but only if the exemption criteria outlined in UG-140 of the BPVC are followed. However, the minimum recirculation line is designed to relief on pressure.

For systems that may be exposed to vacuum (such as vessels potentially exposed to condensing steam) or external pressure (such as jacketed vessels), these conditions should be evaluated as well.

8.6. Electrical

All test sites are served with 480V power by the local electric utility. See section 6.0 "Utilities" for more information.

Hazardous Area classification for the skid is determined by the type of test, and location of the developer's skid. Designs must meet or exceed requirements by the NEC, NFPA 497 and NFPA 499.

8.7. Engineer of Record

For lessee skids that are designed and constructed at the lessee's facility, local and national construction codes should be followed. In some cases, the ITC may request a professional engineer stamped drawing to ensure the system design meets pertinent codes. For example, if a hazardous area classification exists, the determination of the boundaries must be stamped by a qualified Professional Engineer. If a multi-story piece of equipment is to be erected, stamped drawings by a qualified Professional Structural Engineer are required.

9. PROCESS SAFETY

9.1. Design Hazard Analysis

For projects to be implemented at the ITC, it is common to have more than one process hazard analysis or design hazard analysis. Each analysis may be performed as a HAZOP, What-if, or other generally accepted type of PHA. PHA's typically conducted for projects at the ITC are:

9.2. Test Partner Preliminary Hazard Review

This review can be conducted based on process flow diagrams or preliminary P&ID's. The purpose of this review is to identify any obvious issues that could impact the project scope or design. Understanding the process intent, raw

materials, process streams, etc. may allow the Operating Contractor personnel to advise the lessee in determining which types of process safeguards are needed for the vendor system so that they can be incorporated into the initial system design. This is often a good time to identify the highest priority/highest impact process safety parameters. As this hazard review is informal and preliminary, a facilitator is not required. This review can potentially be conducted via video/web/telecon.

9.3. Test Partner Formal Hazard Analysis

This is the formal hazard analysis for the lessee's process and is most typically a HAZOP. The HAZOP should be led by a trained and experienced HAZOP facilitator who may be an employee or contractor for the test partner. Operating Contractor participation in this HAZOP is required. This can typically be arranged to take place at the ITC or at the Test Partner's facility. At a minimum, the following documentation should be completed prior to the formal hazard analysis:

- process design.
- design and operating conditions for each process flow.
- piping and instrumentation diagrams (P&ID's).
- major equipment sizing and selection.
- piping specifications.
- process description.
- startup, shutdown, emergency shutdown, and maintenance sequences.
- Interlock List and logic diagrams.

The above documentation should be provided to the Operating Contractor at least one week prior to the HAZOP. The completed HAZOP documentation showing the detailed resolution of all action items generated during the HAZOP must be provided to ITC prior to startup of the lessee's unit.

9.4. ITC Design Hazard Review (DHR)

This hazard review includes any design changes that the Operating Contractor implements (within ITC process boundaries) in order to facilitate the installation of the test partner. Lessee participation is not required in the DHR.

9.5. Hazard Review for Design Changes

It is desired that the P&ID's, process, and design be as close to finalized as possible at the time that the Test Partner Hazard Analysis is completed. However, design changes are often made after the HAZOP process has been completed. For any substantial design changes that are implemented after the formal HAZOP has been conducted, a follow-up review for such changes must be conducted and incorporated with the initial HAZOP documentation. The

definition of a “substantial design change” would be any change that would require a HAZOP if it were being performed as a stand-alone project. Such changes are typically associated with changes in process flow, process chemistry, overpressure or over-temperature protection, etc.

BEPC should receive notification that the HAZOP has been completed prior to delivering flue gas to the lessee.

9.6. Documentation

In addition to the documentation noted in other sections of this document, the ITC and BEPC requires that the lessee provide the following information at a minimum:

- Safety Data Sheets (SDS) for all materials to be used on site prior to the delivery of the materials.
- All operating, startup, shutdown, emergency shutdown, and maintenance procedures for the test partner’s process.
- A list of all process interlocks for the test partner’s process.
- A function check list that the test partner plans to execute during the commissioning phase of the project after construction is completed.

9.7. Pre-Startup Safety Review

Prior to startup of the lessee’s process, a Pre-Startup Safety Review (PSSR) is required. This review consists of a review meeting as well as a field walk-down of the test partner’s equipment. During the review meeting, the lessee and the ITC will review the project and process documentation to ensure completion of all documentation, verify that all DHR action items have been completed, and verify that all operating and process safety information has been received by the ITC. The field walk-down should evaluate the field construction for completeness and verify that the construction is representative of the design criteria. ITC Project Sequence checklist can be reviewed for additional details.

10. PERSONAL SAFETY

10.1. ITC Safety and Environmental Policies

The ITC’s safety and environmental policies and procedures are documented in the “ITC Lessee Safety and Environmental Manual”. The manual details the requirements for all those working at the ITC including

Lessees, their employees and contractors. The manual will be provided on request.

10.2. OSHA Requirements

Under federal law, all employees are entitled to a safe workplace. As an employer, you, the lessee, must provide a workplace free of known health and safety hazards and must comply with all OSHA standards:

- Provide a workplace free from serious recognized hazards and comply with standards, rules and regulations issued under the OSH Act.
- Examine workplace conditions to ensure they conform to applicable OSHA standards.
- Make sure employees have and use safe tools and equipment and properly maintain this equipment.
- Use color codes, posters, labels or signs to warn employees of potential hazards.
- Establish or update operating procedures and communicate them so that employees follow safety and health requirements.
- Employers with hazardous chemicals in the workplace must develop and implement a written hazard communication program and train employees on the hazards they are exposed to and proper precautions.
    - To classify hazards according to OSHA standards you must provide specific criteria for classification of health and physical hazards, as well as classification of mixtures.
    - Labels including a harmonized signal word, pictogram, and hazard statement for each hazard class and category must be provided. Precautionary statements must also be provided.
- Post, at a prominent location within the workplace, the OSHA poster informing employees of their rights and responsibilities.
    - The poster can be found for free at www.osha.gov/Publications/poster.html.
- Report to the nearest OSHA office all work-related fatalities within 8 hours, and all work-related inpatient hospitalizations, all amputations and all losses of an eye within 24 hours.
    - To report to OSHA call OSHA's toll free number: 1-800-321-6742.
- Not discriminate against employees who exercise their rights under the Act to report injuries, safety concerns, or other protected activities.
- Post OSHA citations at or near the work area involved. Each citation must remain posted until the violation has been corrected, or for three working days, whichever is longer. Post abatement verification documents or tags.
- Correct cited violations by the deadline set in the OSHA citation and submit required abatement verification documentation.
- OSHA encourages all employers to adopt an Injury and Illness Prevention Program.
- Employers with over 10 employees within one year must keep records of work-related injuries and illnesses (OSHA Form 300). On February 1, and for

three months, employers with over 10 employees must post the summary of the OSHA log of injuries and illnesses (OSHA Form 300A).
    - Records of work-related injuries and illnesses need only include serious work-related injuries and illnesses. Minor injuries requiring first aid only do not need to be recorded. Some examples of serious injuries or illness include: loss of consciousness, diagnosed case of cancer, chronic irreversible diseases, fractured or cracked bones or teeth, punctured eardrums or any injury or illness that causes an employee days away from work, restricted work, or transfer to another job. These serious injuries and illnesses need only to be reported if they are work-related.
- For more information, please refer to OSHA's website, www.osha.gov, or the Wyoming Department of Workforce Services' website, wyomingworkforce.org/businesses/osha/compliance.

12. PROJECT MANAGEMENT

12.1. Project Sequence Checklist

Please refer to the attached "Project Sequence Checklist" for a summary of requirements for bringing a project online at the ITC. The checklist applies to vetted projects that have obtained a lease for project space at the ITC (or the lease agreement is in process). The list may not account for all project requirements and is subject to change as individual project specifics may warrant.

12.2. Division of Responsibility

During the engineering and design phase of the project, the Operating Contractor's role is to review the lessee's system and offer guidance on process safety standards. ITC and the Operating Contractor do not accept design responsibility for the lessee's equipment or design.

The following is NOT the responsibility of BEPC nor the ITC, and is solely the responsibility of the lessee:

- Installing foundations for equipment.
- Unloading, installing, and anchoring skid(s) – see Section 7.1 .
- Routing process gas supply/return, and utility piping to the boundary of the process.
- Routing a single electrical power supply with disconnect to the test partner's skid.
- Waste water disposal or characterization of waste water to be returned to DFS if provisions exist for the leased test bay.
- Commissioning and startup of the skid.

12.2. Work Plan

The work plan will serve as an auxiliary to the contract between the ITC and the lessee and will be used to identify all scope to be executed. For example, if installation of the lessee's equipment requires the use of a rental crane or if specialized bottled gases are required, the lessee is anticipated to assume these costs. The work plan should be negotiated and agreed upon before detailed design of the project installation proceeds.

12.3. Tier 1 Information

Tier 1 information is the preliminary, up-front documentation provided by the lessee. The ITC and its ITC Operating Contractor require this information to complete a preliminary process review. This information is to be provided by the lessee to include the following as a minimum:

- General project background information and test objectives.
- Process Flow Diagram.
- Preliminary P&IDs .
- Material Safety Data Sheets.
- Major Equipment Specifications.
- Design Pressures and Temperatures for each line/component noted on P&ID's.
- Process Description.
- Completed Work Plan that has been agreed to by the ITC Operating Contractor and the test partner.
- Desired pressures and capacities for all process flows (process gases, utilities, vents, waste streams, and electricity).
- Estimated Motor Loads.
- Lessee Project Milestone Schedule.
- General dimensions of process skid(s).
- Lessee's gas analysis plan (what samples, what analysis and when) .

12.4. Scheduling

The ITC will make every effort to accommodate the lessee's schedule goals for implementation of projects and will keep the lessee advised of open test opportunities at all phases of the project. In order to implement as many successful tests for as many partners as possible, the ITC must focus our operating engineering and technical resources on the projects for which all of the required information has been supplied. Because delay in receiving information from the lessee can greatly impact the schedule of a project, the operating contractor utilizes the tiered information system to assist the lessee in understanding what information is required at each stage of the process.

12.5. Data Requirements

Developers who test at the ITC are required, as part of the facility's contractual obligations to its lessees, to report certain elements related to testing their technologies. The intent is to provide project partners and the public with the data necessary to make educated decisions on the state of carbon capture technologies and to gauge the readiness level of these technologies for commercialization. Trade secrets or other

proprietary information are not required to be made public and every effort to protect them will be made. To protect this information, data is classified into the following general structure based on the types of information that will be requested by the ITC and project partners:

- Unlimited Rights Data (public, unrestricted data).
- Performance technical, Scale up potential and Economic Data.
- Technical Data Not Required to be Delivered, Proprietary Data on process and methodology.
- Protected Rights Data.

14. INSTALLATION/CONSTRUCTION

For any field work to be completed within the boundary of the lessee's equipment, the lessee shall provide experienced and qualified site designated installation and commissioning personnel who will be active in providing technical direction for equipment installation and mechanical completion, commissioning, performance and acceptance testing of all items under the partner's scope of supply. Depending on the size and scope of the construction work to be performed, a dedicated safety manager (who is experienced in the field of safety supervision) may be required. If this is deemed necessary, it is the responsibility of the lessee or the lessee's contractor to provide.

15. OPERATION

15.1. Operators

Lessees should provide qualified and experienced field operators for the startup and shutdown of their system.

If the lessee determines that operation of the unit requires more frequent or continuous monitoring, the lessee shall provide their own qualified operators. Operators should be experienced in industrial process operations. BEPC or the ITC may request operator credentials prior to startup.

15.2. Control Systems

Lessee`s skids should be operated and controlled independently through their own DCS, PLC, etc. and will not have access to DFS's control network. Remote operation and control of the lessee's system may be considered.

16. DISPOSITION OF MATERIALS

At the conclusion of testing, any raw materials such as catalysts, solvents, or spent sorbents must be removed from the site by the lessee.

17. HOMELAND SECURITY

Any chemicals on the plant site must be evaluated to determine if they are considered a "DHS Chemical of Interest." The lessee must determine if the composition or concentration of a component may trigger a notification or screening as outlined in *6 CFR Part 27 - CHEMICAL FACILITY ANTI-TERRORISM STANDARDS*. If so, this should be brought to the attention of BEPC and ITC personnel as soon as possible.

Notes – add the following attachements when making the final PDF

a. *ITC GA Drawing*
b. *Project Sequence Checklist*