Statement of Objectives (SOO)
Attachment 1 – Performance Parameters
Appendix B – Design Review Expectations
AEDC-Arnold AFB: High Pressure Air Storage Expansion

Required Design Reviews

1. Contractor Readiness Review (CRR)
2. Conceptual Design Review (CoDR)
3. Preliminary Design Review (PDR)
4. Intermediate Design Review (IDR)
5. Critical Design Review (CDR)
6. Final Design Review (FDR)
7. Verification Readiness Review (VRR)
8. Procurement Readiness Review (PRR)
9. Execution Readiness Review (ERR)

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PROJECT HIGH PRESSURE AIR STORAGE EXPANSION
NOMENCLATURE
Initial – Rough draft of the required documentation that sufficiently demonstrates intended format and content. Documentation should include all known relevant information; however, it is acknowledged that significant amounts of information may still be undetermined or inaccurate. Significant unverified assumptions and placeholders identifying unknown information are acceptable. **Draft** – Complete documentation, including all currently known relevant information in an appropriate format, that has not completed a formal peer review or other checking process. Draft documentation may include marked up copies of existing approved documentation as long as all required changes to the document are clearly and completely identified. Documents that are currently undergoing a formal peer review or other checking process are considered to be in the Draft state regardless of where they are in that process. Unverified assumptions may be used, but should be justified as reasonable. Placeholders identifying unknown information may be used, but should be limited and clearly identify when and how the information will be determined and provided. **Preliminary** – Documentation that has completed an initial peer review, but has not completed a formal checking process or received final approval for release. Documentation is complete, accurate, and sufficient to support the proposed solution, but may still require minor corrections, changes to formatting, or changes to details not directly impacting the final solution. All assumptions should be verified to the maximum extent possible, and all unverified assumptions should be clearly identified. Bounding assumptions (e.g. worst-case conditions) or explicitly approved assumptions may be considered to be verified. Documents that contain significant unverified assumptions are considered to be in the Preliminary state regardless of where they are in the checking process. Placeholders identifying unknown information should not be used. **Approved** – Documentation that has completed a formal peer review or other checking process and received final approval for release. Documentation is complete, accurate, and fully justifies the proposed solution. Documents shall be submitted as a complete and final product, including signatures verifying that the document has been checked and approved, but documentation is not required to be submitted into the CMMS. All assumptions should be verified or explicitly approved. **Final** – Documentation that has been approved for release and is ready for execution. TOS documents should be fully approved in the CMMS. Outside Contractor documents shall be submitted as a complete package ready for exection, including signatures verifying that all documents have been checked and approved, but documentation is not required to be submitted into the CMMS.
REQUIRED ATTENDEES
AF Chairperson/Final Approval: Decision Authority or Designee [DA]
AF Representatives: Air Force Project Manager or Designee [AF PM], PMD Technical Advisor or Designee [PMD], Test Group Technical Advisor or Designee [TG], Test Support Squadron Asset Owner or Designee [TSS], Test Squadron Technical Advisor or Designee [TS], ID&C Representative or Designee [TSDI], Civil Engineering Representative or Designee [TSDC], XP Representative or Designee [XP]* * XP required for TIPP and CTEIP projects only

CONTRACTOR READINESS REVIEW (CRR)					
ENTRANCE CRITERIA			WORK PRODUCTS TO BE DELIVERED BY CONTRACTOR	ACCEPTABLE FORMAT(S)	CONCURRENCE
Any required work product not provided for this review, or any work product not provided in the required state, shall have written Government approval for the status of the product prior to commencing the review process. Documentation of Government approval shall be provided, clearly identifying the associated work product(s).					
1.1	**Review Documentation**		**Comments Log** Provide a Comments Log for this review. Comments Log shall include, at a minimum, the following: - All reviewer provided comments - Resolution or disposition for each comment - Status of reviewer concurrance for each comment	Location: Review Folder Format: Excel Spreadsheet If a **TEMPLATE** or **EXAMPLE** Comment Log is desired, the Government will provide one upon request.	AF PM
1.2			**Project Summary** Provide a brief project summary. Summary shall clearly identify, at a minimum, the following: - Purpose of the project - Current scope of the project - Approvals requested as part of this review - Scope changes or clarifications requested as part of this review - Requirements revisions or clarifications requested as part of this review	Location: Presentation Format: Narrative	AF PM
1.3			**Entrance Criteria** Provide a list of all required Entrance Criteria with mapping to the satisfying documentation. The list shall include the following: - Identification of all approved Entrance Criteria for this review - Acceptable location and format for each item listed - Presentation slide or file intended to satisfy each item listed	Location: Presentation Format: Table	AF PM
2.1	**Requirements**	**Requirements Documentation**	**Requirements Documents** Provide a copy of all requirements documents approved for use at the time of this review. Documents shall include, as available, the following: - Other Transaction Prototype Project Agreement (OTP) - Statement of Objectives (SOO) / Performance Parameters (PP) Requirements documents shall be provided in the original, unaltered state. Any proposed corrections, changes, or other revisions shall be provided separately.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
2.2			**Statement of Work** Provide a copy of the complete Statement of Work identifying how the Contractor intends to satisfy the requirements documents. The Statement of Work shall include, at a minimum, the following: - What specific activities will be performed - Codes and standards applicable to each activity - What requirements or acceptance criteria will be applied to each activity - What deliverables will be provided for each activity - How each activity will be verified as correct Statement of Work shall be provided in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TG TS TSS
2.3		**Requirements Verification**	**Requirements Mapping** Provide mapping of requirements between the approved requirements documents and the proposed Statement of Work. Requirements mapping shall verify, at a minimum, the following: - All requirements established in the requirements documents have been addressed by the requirements and activities identified in the Statement of Work - All requirements and activities identified in the Statement of Work are justified by the requirements established in the requirements documents unless otherwise approved by the Government Requirements or activities in the Statement of Work that are not directly justified by requirements in the provided requirements documents must be clearly identified with a justification as to why the requirement should be included.	Location: Presentation Format: Table If a **TEMPLATE** or **EXAMPLE** Requirements Mapping is desired, the Government will provide one upon request.	TG TS TSS
3.1	**Programmatic Documentation**		**Work Breakdown Structure (WBS)** Provide a detailed Work Breakdown Structure (WBS) to at least Level 3. WBS shall include, at a minimum, the following: - Level 1 identifies each project phase and/or location - Level 2 as follows: 01 - Project Management 02 - Planning 03 - Design 04 - Procurement 05 - Fabrication / Software Development 06 - Installation 07 - Checkout 08 - Closeout 09 - Risk Tracking and Mitigation If a given Level 2 section is not applicable to a particular Level 1 phase or location, it may be omitted.	Location: Presentation Format: Table or List	AF PM
3.2			**Project Schedule** Provide a copy of the current project schedule. Schedule shall include, at a minimum, the following: - Proposed timing and duration of planning phase - Proposed timing and duration of design phase - Proposed timing for each design review or milestone - Proposed timing and duration of execution phase - Proposed timing and duration of checkout phase - Proposed timing of completion	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF, 11"X17" Format Location: Review Folder Format: Original File in Native File Format	AF PM

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3.3		**Risk Assessment Matrix** Identify all known risks associated with both executing in accordance with the recommendation and not executing in accordance with the recommendation. Risk identification shall include the following: • All known risks that could significantly affect the technical solution • All known risks that could significantly affect the project cost • All known risks that could significantly affect the project schedule • Any known or potential funding disconnects • Likelihood of each listed risk • Cost, schedule, or performance impact of each listed risk	Location: Presentation Format: Link to File Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Risk Assessment Matrix is desired, the Government will provide one upon request.	TG XP*
3.4		**Exit Criteria** Provide a list of all approved Exit Criteria.	Location: Presentation Format: Table or List	AF PM
3.5		**Entrance Criteria** Provide a list of Entrance Criteria for the next scheduled review. The list shall include the following: • All Government-identified Entrance Criteria for the next scheduled review • Requested deviations from the Entrance Criteria for the next scheduled review If no deviations are requested, this should be clearly stated.	Location: Presentation Format: Table or List	AF PM TG
EXIT CRITERIA				
	Agreement that the Statement of Work defines a process capable of satisfying the approved requirements and the stated need.		*Meeting Minutes Signed AEDC-1683 indicating Approval AEDC-1565 capturing Deficiencies and Action Items.	
	Agreement that the Statement of Work defines a process that is achievable within the estimated cost and schedule.			
	Agreement that the technical performance, cost, and schedule risks are acceptable.			
	Agreement that the Entrance Criteria for the next review are acceptable.			

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CONCEPTUAL DESIGN REVIEW (CoDR)

	ENTRANCE CRITERIA		WORK PRODUCTS TO BE DELIVERED BY CONTRACTOR	ACCEPTABLE FORMAT(S)	CONCURRENCE
Any required work product not provided for this review, or any work product not provided in the required state, shall have written Government approval for the status of the product prior to commencing the review process. Documentation of Government approval shall be provided, clearly identifying the associated work product(s).					
1.1	Review Documentation		**Comments Log** Provide a Comments Log for this review. Comments Log shall include, at a minimum, the following: - All reviewer provided comments - Resolution or disposition for each comment - Status of reviewer concurrance for each comment	Location: Review Folder Format: Excel Spreadsheet If a **TEMPLATE** or **EXAMPLE** Comment Log is desired, the Government will provide one upon request.	AF PM
1.2			**Deficiencies and Action Items.** Provide an updated status for all previous deficiencies and action items. Update shall include the following: - Copy of the signed AEDC-1565 from the previous review - Updated status for all deficiencies and action items listed All unresolved deficiencies or action items shall be clearly identified with documentation indiciating prior Government approval to move forward.	AEDC-1565 Location: Review Folder Format: PDF Status List Location: Presentation Format: Table	TG TS TSS
1.3			**Requirements Documents** Provide a copy of all requirements documents approved for use at the time of this review. Documents shall include, as available, the following: - Other Transaction Prototype Project Agreement (OTP) - Statement of Objectives (SOO) / Performance Parameters (PP) Requirements documents shall be provided in the original, unaltered state. Any proposed corrections, changes, or other revisions shall be provided separately. All approved changes to the requirements documents from the previous review shall be clearly identified.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
1.4			**Project Summary** Provide a brief project summary. Summary shall clearly identify, at a minimum, the following: - Purpose of the project - Current scope of the project - Approvals requested as part of this review - Waivers or deviations requested as part of this review - Scope changes or clarifications requested as part of this review - Requirements revisions or clarifications requested as part of this review	Location: Presentation Format: Narrative	AF PM
1.5			**Entrance Criteria** Provide a list of all required Entrance Criteria with mapping to the satisfying documentation. The list shall include the following: - Identification of all approved Entrance Criteria for this review - Acceptable location and format for each item listed - Presentation slide or file intended to satisfy each item listed	Location: Presentation Format: Table	AF PM
1.6			**Deviations from Entrance Criteria** Provide a detailed list of requested deviations from the approved Entrance Critera. The list shall include the following: - All Entrance Criteria that are not satisfied by the information presented at this review - Verification of prior Government approval for the deviation (if previously approved)	Location: Presentation Format: List	TG
2.1	Conceptual Design	Basis of Design	**Design Approach** Provide a general description of the basic design approach. Design approach shall include, at a minimum, the following: - Detailed scope of the project - Physical boundaries of the project - General description of the proposed solution - Initial system or equipment sizing - Initial material selections The basic design approach should specifically identify any potential non-traditional fabrication methods (e.g. additive manufacturing).	Location: Presentation Format: Narrative	TG TS
2.2			**Assumptions** Provide a list of all assumptions or approximations used in the development of the proposed solution. The list shall include, at a minimum, the following: - What assumptions or approximations were made - How each assumption or approximations was used - Why each assumption or approximation is considered reasonable - If and how each assumption or approximation will be verified Initial simplifying assumptions that cannot be justified are acceptable, but should be clearly identified.	Location: Presentation Format: Table or List *Links to additional files are acceptable if required to convey all known information.*	TG TS
2.3		Concept Documentation	**Process Diagram** Provide a flow or line diagram that clearly depicts the significant features of the proposed solution. The diagram shall include, at a minimum, the following: - Expected equipment and devices in the system - Relative locations and connections for expected equipment and devices - Expected external system connections	Location: Presentation Format: Images with Notation *Links to additional files are acceptable if required to convey all known information.*	TS
2.4			**Sketches or Models** Provide sketches or model images depicting the proposed solution. Images shall be sufficient to identify the following: - General arrangement of major equipment - Intended installation location of the system - Area available for installation of the system	Location: Presentation Format: Images with Notation *Links to additional files are acceptable if required to convey all known information.*	TS
2.5			**System Interface Diagram** Provide a System Interface Diagram. The diagram shall identify all external systems that interface directly with the proposed system and shall include, at a minimum, the following: - Clear identification of each interfacing system (e.g. process systems, hydraulic systems, data systems, control systems, electrical power) - Direction of media, information, signal, or power flow between systems	Location: Presentation Format: Block Diagram	TS

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2.6		Work Environment	**Site Plan** Provide a Site Plan indicating where the work is to be performed. Site Plan shall include, at a minimum, the following: • Visual representation identifying the building or area • Visual representation of where that building or area is located on the base • Visual representation of where within the building or area the work is to be performed	Location: Presentation Format: Images with Notation *Links to additional files are acceptable if required to convey all known information.*	TG
2.7			**Existing Conditions** Provide a description of the existing conditions. Existing condtions shall include, at a minimum, the following: • Systems and resources in the area • Structures and buildings in the area • Utilities in the area • Existing materials	Location: Presentation Format: Narrative or Images with Notation *Links to additional files are acceptable if required to convey all known information.*	AF PM
2.8		Readiness Assessment	**Provide a Technology Readiness Assessment.** Provide a detailed Technology Readiness Assessment. The assessment shall include, at a minimum, the following: • Components, equipment, or technologies that must be developed or leveraged, beyond what is currently readily available, for the project to succeed • Current developmental status of each listed item • Required developmental status of each listed item	Location: Presentation Format: Table or List	TG TS
3.1	Programmatic Documentation	Planning	**Gap Analysis** Provide a Gap Analysis. Analysis shall include, but not be limited to, the following: • Activities outside the project scope that must be completed for project success • Status for each identified activity (e.g. unfunded, funded, planned, or in progress) • Funding gaps within the project	Location: Presentation Format: Table or List	AF PM
3.2			**Verification, Validation, and Acceptance** 'Provide a high-level list of VV&A activities required for the proposed solution. List shall identify, at a minimum, the following: • Any expected calibration • Any expected inspections • Any expected testing • Any expected demonstrations	Location: Presentation Format: List	TG TS
3.3		Risks & Hazards	**Hazard List** Provide a Hazard List identifying all known hazards associated with operation and maintenance of the system. The list shall identify the following: • All known hazards that could pose a threat to personnel, equipment, the environment, or operational capability • System, subsystem, or component associated with the hazard • Conditions or events that would cause the hazard • Potential adverse effects as a result of the hazard	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TG TS TSS
3.4			**Risk Assessment Matrix** Provide a Risk Assessment Matrix identifying all known risks associated with execution of the project in accordance with the proposed plans. Risk assessment shall include the following: • All known risks that could significantly affect the technical solution • All known risks that could significantly affect the project cost • All known risks that could significantly affect the project schedule • Any known or potential funding disconnects • Likelihood of each listed risk • Cost, schedule, or performance impact of each listed risk • Potential mitigation activities for each listed risk • When each identified mitigation activity will be implemented • Adjusted likelihood and impact for each listed risk after mitigation	Location: Presentation Format: Summary Table with Link to File Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Risk Assessment Matrix is desired, the Government will provide one upon request.	TG XP*
3.5		Cost & Schedule	**Project Schedule** Provide a current project schedule. Schedule shall include, at a minimum, the following: • Proposed timing and duration of planning phase • Proposed timing and duration of design phase • Proposed timing for each design review or milestone • Proposed timing and duration of execution phase • Proposed timing and duration of checkout phase • Proposed timing of completion	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF, 11"X17" Format Location: Review Folder Format: Original File in Native File Format	AF PM
3.6			**Project Cost Estimate** Provide a current project cost estimate. Estimate shall identify, at a minimum, the anticipated total cost for each of the following: • Major procurements • Design labor • Fabrication materials & labor • Installation materials & labor • Verification labor & utilities • Project management • Overall project	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
3.7		Design Review Criteria	**Exit Criteria** Provide a list of all approved Exit Criteria.	Location: Presentation Format: Table or List	AF PM
3.8			**Entrance Criteria** Provide a list of Entrance Criteria for the next scheduled review. The list shall include the following: • All Government-identified Entrance Criteria for the next scheduled review • Requested deviations from the Entrance Criteria for the next scheduled review If no deviations are requested, this should be clearly stated.	Location: Presentation Format: Table or List	AF PM TG

EXIT CRITERIA	
Agreement that the proposed design solution and supporting information describe a system that will likely meet the technical requirements.	*Meeting Minutes Signed AEDC-1683 indicating Approval AEDC-1565 capturing Deficiencies and Action Items.
Agreement that the proposed design solution and supporting information describe a system that is likely achieveable within the defined cost and schedule.	
Agreement the technical performance, cost and schedule risks for the effort are acceptable.	
Agreement that the Entrance Criteria for the next SE review are acceptable.	

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PRELIMINARY DESIGN REVIEW (PDR)

	ENTRANCE CRITERIA		WORK PRODUCTS TO BE DELIVERED BY CONTRACTOR	ACCEPTABLE FORMAT(S)	CONCURRENCE
Any required work product not provided for this review, or any work product not provided in the required state, shall have Government approval for the status of the product prior to commencing the review process. Documentation of Government approval shall be provided, clearly identifying the associated work product(s).					
1.1	Review Documentation		**Comments Log** Provide a Comments Log for this review. Comments Log shall include, at a minimum, the following: ▪ All reviewer provided comments ▪ Resolution or disposition for each comment ▪ Status of reviewer concurrance for each comment	Location: Review Folder Format: Excel Spreadsheet If a **TEMPLATE** or **EXAMPLE** Comment Log is desired, the Government will provide one upon request.	AF PM
1.2			**Deficiencies and Action Items.** Provide an updated status for all previous deficiencies and action items. Update shall include the following: ▪ Copy of the signed AEDC-1565 from the previous review ▪ Updated status for all deficiencies and action items listed All unresolved deficiencies or action items shall be clearly identified with documentation indiciating prior Government approval to move forward.	AEDC-1565 Location: Review Folder Format: PDF Status List Location: Presentation Format: Table	TG TS TSS
1.3			**Requirements Documents** Provide a copy of all requirements documents that have been used as the basis for this review. Documents shall include, at a minimum, the following: ▪ Statement of Objectives (SOO) and/or Performance Parameters (PP) ▪ Other Transaction Prototype Project Agreement (OTP) ▪ Contractor Derived Requirements All requirements documents shall include a revision designation or a date of approval to ensure accurate document control. Requirements documents shall be provided in the approved and unaltered state. Any proposed corrections, changes, or other revisions shall be provided separately. All approved changes to the requirements documents from the previous review shall be clearly identified.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
1.4			**Project Summary** Provide a brief project summary. Summary shall clearly identify, at a minimum, the following: ▪ Purpose of the project ▪ Current scope of the project ▪ Approvals requested as part of this review ▪ Waivers or deviations requested as part of this review ▪ Scope changes or clarifications requested as part of this review ▪ Requirements revisions or clarifications requested as part of this review	Location: Presentation Format: Narrative	AF PM
1.5			**Entrance Criteria** Provide a list of all required Entrance Criteria with mapping to the satisfying documentation. The list shall include the following: ▪ Identification of all approved Entrance Criteria for this review ▪ Acceptable location and format for each item listed ▪ Presentation slide or file intended to satisfy each item listed	Location: Presentation Format: Table	AF PM
1.6			**Deviations from Entrance Criteria** Provide a detailed list of requested deviations from the approved Entrance Critera. The list shall include the following: ▪ All Entrance Criteria that are not satisfied by the information presented at this review ▪ Verification of prior Government approval for the deviation (if previously approved) ▪ Requests for Government approval for the deviation (if not previously appoved)	Location: Presentation Format: List	TG
2.1		Design Update	**Summary of Changes** Provide a detailed summary of any significant design changes from the previous review. Significant design changes shall include, but are not limited to, changes to the following: ▪ General configuration ▪ Installation location ▪ Installation footprint ▪ Equipment size or capacity ▪ Fabrication method ▪ Materials of construction ▪ Structural loads ▪ Major equipment requirements Changes resulting in a significant increase in project cost or schedule shall be clearly identified.	Location: Presentation Format: List	AF PM
2.2		Basis of Design	**Assumptions** Provide a current list of all assumptions used in the development of the proposed solution. The list shall include, at a minimum, the following: ▪ What assumptions or approximations were made ▪ How each assumption or approximations was used ▪ Why each assumption or approximation is considered reasonable ▪ If and how each assumption or approximation will be verified All changes, including verified assumptions, from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Table or List *Links to additional files are acceptable if required to convey all known information.*	TG TS
2.3			**System Interface Diagram** Provide a current System Interface Diagram. The diagram shall identify all external systems that interface directly with the proposed system and shall include, at a minimum, the following: ▪ Clear identification of each interfacing system (e.g. process systems, hydraulic systems, data systems, control systems, electrical power) ▪ Direction of media, information, signal, or power flow between systems Any changes from the previous System Interface Diagram shall be clearly identified.	Location: Presentation Format: Block Diagram	TS

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2.4	**Design Approach**		**System Safety Features** Provide a current list of all expected system safety features that will be incorporated into the proposed solution to address identified operational hazards. The list shall include, at a minimum, the following: ▪ Safety features, components, or devices intended to protect personnel or equipment during operation (e.g. barriers, restrictions, or interlocks) ▪ Code-required safety devices (e.g. relief valves or breakers) ▪ Additional safety devices (e.g. temperature control systems or emergency shutdown buttons) If no special system safety features are required, this should be clearly stated.	Location: Presentation Format: List	TS
2.5		**System Information**	**Operating Limits** Provide a current list of any identified safe operating limits for the system as proposed. Limits should address individual crtical parameters and may include, but not be limited to, the following: ▪ Minimum system supply (e.g. pressure or voltage) ▪ Maximum system discharge (e.g. pressure or voltage) ▪ Maximum capacity (e.g. flow rate or power) ▪ Controllable capacity range (e.g. flow rate or power) ▪ Maximum allowable losses associated with unknown or customer equipment (e.g. pressure loss or resistance) Identified limits should establish how far beyond the established design parameters the system is still capable of functioning using the proposed design. The limiting factor for each parameters should be identified (e.g. pressure rating, wall thickness, equipment capacity, cable size).	Location: Presentation Format: List	TS
2.6		**Work Environment**	**Site Plan** Provide a current Site Plan indicating where the work is to be performed. Site Plan shall include, at a minimum, the following: ▪ Visual representation identifying the building or work area ▪ Visual representation of where the building or area is located on the base ▪ Visual representation of where within the building or area the work is to be performed ▪ Visual represenation of the location and size of area required for installation ▪ Visual represenation of the location of existing utilities relevant to the project (e.g. water, steam, natural gas, electrical conduits, high pressure air) ▪ Visual representation of potential encroachment into Explosive Site Plans (ESP) or other known hazardous areas as identified by the Government Any changes from the previous Site Plan shall be clearly identified.	Location: Presentation Format: Images with Notation *Links to additional files are acceptable if required to convey all known information.*	TG
3.1		**Mechanical Design**	**Process System Schematics** Provide copies of all process system schematics and P&ID drawings required to clearly depict the significant features of the intended design solution. Drawings shall include, at a minimum, the following: ▪ All applicable design conditions ▪ Applicable code(s) of construction ▪ Relative locations of all equipment and devices in primary flow paths ▪ Proposed external system connections ▪ All line sizes for primary flow paths All schematics required to clearly identify the key features of the proposed solution shall be provided in the Preliminary or later state. Any additional schematics or schematics for auxilliary systems may be provided in the Draft or later state.	Location: Presentation Format: Overview Image(s) with Notation Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS
3.2			**Mechanical Drawings** Provide drawings, sketches, or model images required to clearly depict the intended design solution. Images shall be sufficient to completely identify the following: ▪ General arrangement of the system ▪ Intended installation location of each portion of the system ▪ How the system will fit into the available area The images shall include the general location major components, including, but not limited to, of the following: ▪ Expected control devices (e.g. control valves or flow restrictions) ▪ Expected flow measurement devices (e.g. flow meters or orifices) ▪ Expected configuration devices (e.g. primary isolation valves) ▪ Expected piping or equipment supports and support structures ▪ Expected major equipment (e.g. pumps, heat exchangers, or test equipment) Drawings, sketches, or model images provided should contain sufficient detail to clearly establish that the intended design is consistent with the provided schematics; however, complete and detailed drawings are not required. Additional information, such as detailed material callouts and specific system details showing the location and configuration of maintenance features (e.g. high point vents, low point drains, or instrumentation lines) should be provided if available.	Location: Presentation Format: Image(s) with Notation *Links to additional files are acceptable if required to convey all known information.*	TS TSS
3.3			**Mechanical Analysis** Provide analysis required to justify that the proposed design solution is generally viable and capable of satisfying the established requirements. Analysis shall include, at a minimum, the following: ▪ Line sizing and wall thickness for primary process lines ▪ Component sizing and selection ▪ Material evaluations ▪ Primary equipment sizing ▪ Primary control device sizing All analysis shall be provided as a complete report, including clear identification of all inputs and evaluation methods and a clear and concise conclusion. All analysis required to justify the proposed design solution shall be in the Preliminary or later state. Additional analysis provided for information only may be in the Draft state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS

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3.4	Preliminary Design Documentation	Structural Design	**Structural Drawings** Provide drawings, sketches, or model images required to clearly depict the intended design solution. Images shall be sufficient to completely identify the following: ▪ General size and location of all new or modified foundations ▪ General location and construction of support structures ▪ General location and size of platforms and walkways Drawings, sketches, or model images provided should contain sufficient detail to clearly establish the intended design. Additional information, such as detailed material callouts and specific fabrication details should be provided if available.	Location: Presentation Format: Image(s) with Notation *Links to additional files are acceptable if required to convey all known information.*	TSDC TSS
3.5			**Structural Analysis** Provide analysis required to justify that the proposed design solution will not negatively affect existing buildings, structures, or foundations. Analysis shall include, at a minimum, the following: ▪ Evaluation of existing buildings subject to new or increased loads ▪ Evaluation of existing structures subject to new or increased loads ▪ Evaluation of existing foundations subject to new or increased loads All analysis shall be provided as a complete report that includes, at a minimum, the following for each building, structure, or foundation evaluated: ▪ Code of Construction ▪ Existing loads ▪ Additional loads expected as a result of the proposed solution ▪ Clear identification of all inputs ▪ Clear identification of all evaluation methods ▪ Clear and concise conclusion All analysis required to justify the proposed design solution shall be in the Preliminary or later state. Additional analysis provided for information only may be in the Draft state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC
3.6		Electrical Power Design	**Electrical Power Requirements** Provide a current list of electrical power requirements for the system based on the provided schematics. The list shall contain, but not be limited to, the following: ▪ Identification of powered equipment (e.g. heaters, turbines, refrigeration units, pump motors, valve actuator motors, or other process equipment) ▪ Identification of powered utilities and services (e.g. HVAC, lights, speakers, outlets, cranes, or other building utilities) ▪ Estimated power requirements for each piece of listed equipment (e.g. voltage and amperage)	Location: Presentation Format: Table *Links to additional files are acceptable if required to convey all known information.*	TSDC
3.7		Instrumentation & Controls Design	**Input/Output Parameters** Provide a current list of I/O parameters required to accomodate all controls and instrumentation based on the provided schematics. For each parameter, the list shall identify, at a minimum, the following: ▪ Device type (e.g. flow meter, control valve, or pressure transmitter) ▪ Device name as shown on the schematic ▪ The purpose of the I/O parameter ▪ Parameter control or feedback signal types ▪ If the parameter can be locally controlled ▪ If the parameter can be remotely controlled, including identification of the intended control room or control system	Location: Presentation Format: Table *Links to additional files are acceptable if required to convey all known information.*	TSDI
3.8			**Control Methodology** Provide a detailed narrative describing the high-level control methodology for the proposed solution. Control methodology shall consider all phases of operation, including startup and shutdown, and identify, at a minimum, the following: ▪ Control of specific devices (e.g. manual or automatic) ▪ Instrumentation required for automated control ▪ Permissives or safety interlocks	Location: Presentation Format: Narrative *Links to additional files are acceptable if required to convey all known information.*	TSDI
3.9		Design Status	**Design Drawing Status** Provide a current list of all schematics, P&ID drawings, line diagrams, fabrication drawings, and installation drawings that will be revised, created, or rendered obsolete as a result of the project, including all drawings that must be revised to provide or revise references. List shall include all mechanical, structural, electrical, and controls drawings. For each drawing, the list shall include, at a minimum, the following: ▪ Drawing number ▪ Drawing title ▪ Status of the drawing at the time of this review ▪ Status of the drawing recommended for the next review If there are no required drawings, this should be clearly stated.	Location: Presentation Format: Table	AF PM
3.10			**Analysis Status** Provide a current list of all analysis or calculation packages that will be created or revised as a result of the project. List shall include all mechanical, structural, electrical, and controls analysis. For each analysis or calculation package, the list shall include, at a minimum, the following: ▪ Calculation identification number ▪ Calculation title ▪ Status of the calculation at the time of this review ▪ Status of the calculation recommended for the next review If there is no required analysis, this should be clearly stated.	Location: Presentation Format: Table	AF PM

4.1		**Procurement Planning**	**Market Research** Provide market research for all major equipment and material procurements. For each procurement, the market research shall identify, at a minimum, the following: ▪ Description and/or Cut Sheet ▪ Anticipated Cost ▪ Anticipated Delivery Time ▪ Potential Vendors	Location: Presentation Format: Table	AF PM
4.2		**Procurement Status**	**Procurement Status** Provide a current list of all procurement documents, including data sheets, equipment specifications, statements of work, or statements of objectives, that will be created or revised as a result of the project. For each procurement document, the list shall include, at a minimum, the following: ▪ Document number ▪ Document title ▪ Status of the document at the time of this review ▪ Status of the document recommended for the next review. If there are no required procurement documents, this should be clearly stated.	Location: Presentation Format: Table	AF PM
4.3	**Procurement Documentation**	**Early Procurements**	**Early Procurement Summary** Provide a current list of procurements that will require release or execution prior to completing the Critical Design Review in order to meet the required schedule or delivery date. For each procurement, the list shall identify, at a minimum, the following: ▪ Equipment or material to be procured ▪ Anticipated cost ▪ Anticipated delivery time ▪ Recommended procurement schedule or release date ▪ Justification for early procurement ▪ Potential risks due to early procurement ▪ Associated procurement documents (e.g. Data Sheet, Specification, SOW, SOO, or Advanced Release BOM) ▪ Schematics and design drawings required to support the procurement documentation ▪ Analysis and calculation reports required to support the procurement documentation If there are no recommended early procurements, this should be clearly stated.	Location: Presentation Format: Table *Links to additional files are acceptable if required to convey all known information.*	AF PM TG
4.4			**Procurement Readiness Review** For each procurement intended to be approved for immediate release as a result of this review, provide all documentation and information identified for a successful Procurement Readiness Review that is not otherwise required by the contents of this review. All procurement documentation shall be in the state required by the Procurement Readiness Review.	Per Procurement Readiness Review	AF PM TS
5.1	**Early Execution**		**Early Execution Summary** Provide a current list of execution tasks, including demoltion, fabrication, installation, or inspection, that will require execution or partial execution prior to completing the Critical Design Review in order to meet the required schedule or delivery date. For each task, the list shall identify, at a minimum, the following: ▪ Task or portion of a task to be executed ▪ Anticipated cost ▪ Recommended execution schedule ▪ Justification for early execution ▪ Potential risks due to early execution ▪ Materials required to support execution ▪ Demolition, fabrication, or installation drawings required to support execution If there are no recommended early execution tasks, this should be clearly stated.	Location: Presentation Format: List *Links to additional files are acceptable if required to convey all known information.*	AF PM TG
5.2			**Execution Readiness Review** For each work task intended to be approved for immediate execution as a result of this review, provide all documentation and information identified for a successful Execution Readiness Review that is not otherwise required by the contents of this review. All procurement documentation shall be in the state required by the Execution Readiness Review.	Per Execution Readiness Review	AF PM TS
6.1		**Execution Planning**	**Demolition Plan** Provide a current Demolition Plan. Plan shall include, at a minimum, all currently known information for the following: ▪ Scope of demolition effort, including all components or structures to be removed ▪ Demolition methods and how each will be used ▪ Required equipment or machinery ▪ How the remaining existing system will be isolated or reconnected ▪ How the system or structures will be supported or stabilized both during and after demolition ▪ Outages and permits required ▪ Issues, concerns, or limitations associated with demolition (e.g. operations, maintenance, or testing impacts) Demolition Plan shall be in the Draft or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Demolition Plan is desired, the Government will provide one upon request.	AF PM
6.2			**Manufacturing Plan** Provide a current Manufacturing Plan. Plan shall include, at a minimum, all currently known information for the following: ▪ Fabrication activities that will be performed ▪ Crafts or specific skills required ▪ Site plan for field fabricaton ▪ Equipment, utilities, or facilities required ▪ Inspection or testing activities required following fabrication ▪ Fabrication and delivery schedule ▪ Issues, concerns, or limitations associated with fabrication (e.g. operations, maintenance, or testing impacts) Manufacturing Plan shall be in the Draft or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Manufacturing Plan is desired, the Government will provide one upon request.	AF PM

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6.3			**Installation Plan** Provide a current Installation Plan. Plan shall include, at a minimum, all currently known information for the following the following: ▪ Installation activities that will be performed ▪ Crafts or specific skills required ▪ Equipment, utilities, or facilities required ▪ Site plan for locating large equipment (e.g. cranes or lifts) ▪ Specific safety or security considerations associated with installation ▪ Installation schedule ▪ Issues, concerns, or limitations associated with installation (e.g. area, service, operations, maintenance, or testing impacts) Installation Plan shall be in the Draft or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Installation Plan is desired, the Government will provide one upon request.	AF PM
6.4			**Concept of Operations** Provide a current Concept of Operations. CONOPS shall describe how the system is intended to be operated, including, at a minimum, all currently known information for the following: ▪ Operational environment (e.g. conditions, assumptions, constraints, or limitations) ▪ How the system is intended to operate, including expected operating conditions (NOT design conditions) ▪ Potential system configurations (e.g. startup, shutdown, maintenance, different users, or different sources) ▪ Lock out-tag out requirements for major equipment The CONOPS shall account for all phases of operation, including checkout, pre-ops, operations, and post-ops. CONOPS shall be in the Draft or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Concept of Operations is desired, the Government will provide one upon request.	TS
6.5	**Planning Documentation**	**Operations Planning**	**Operations and Maintenance Plan** Provide a current Operations and Maintenance Plan. Plan shall include, at a minimum, all currently known information for the following: ▪ All expected routine and preventative maintenance activities ▪ Cost (labor and materials) associated with each activity ▪ Frequency that each activity is expected to be performed ▪ Estimated average yearly operating costs ▪ Recommended spare parts Operations and Maintenance Plan shall be in the Draft or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** O&M Plan is desired, the Government will provide one upon request.	TSS TS
6.6			**Failure Modes and Effects Analysis** Provide a current Failure Modes and Effects Analysis. FMEA shall address, at a minimum, all currently known information for the following: ▪ Failure modes that could result in a non-functional system ▪ Assess the likelihood and impact of each failure mode ▪ Mitigations that could be employed to limit the impact of each failure mode ▪ Assess the likelihood and impact of each mitigated failure mode FMEA shall be in the Draft or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** FMEA is desired, the Government will provide one upon request.	TS
6.7			**Verification, Validation, and Acceptance Plan** Provide a current Verification, Validation, and Acceptance Plan. Plan shall include all currently known information for the following: ▪ Verification and validation activities that will be performed as part of the project ▪ Type of verification or validation provided by each activity (e.g. analysis, inspection, demonstration, or testing) ▪ Why each verification or validation activity is required (e.g. associated project requirement(s), code, or standard) ▪ Acceptance criteria for each verification and validation activity ▪ Documentation to be provided for each activity to show that the acceptance criteria has been satisfied VV&A Plan shall be in the Draft or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** VV&A Plan is desired, the Government will provide one upon request.	TG TS
6.8		**Verification Planning**	**System Test Plan** Provide a current System Test Plan. Plan shall include, but not be limited to, all currently known information for the following: ▪ All inspection and testing activities identified in the VV&A Plan ▪ Activity in the VV&A Plan associated with each inspection or test activity ▪ Specific, step-by-step procedures or instructions that will govern how each activity will be performed (e.g. codes, standards, or work instructions) ▪ Objectives, assumptions, and prerequisites for each test. ▪ Who is responsible, by role, for each step of the test procedure ▪ Equipment and resources required to perform each activity When referencing outside codes and standards, the specific edition and section of the code or standard being reference should be clearly identified. When no existing codes, standards, or work instructions provide suitable procedures or instructions for conducting an identified inspection or testing activity, the System Test Plan shall provide detailed, step-by-step instructions for how the activity is to be performed. System Test Plan shall be in the Draft or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** STP is desired, the Government will provide one upon request.	TG TS

6.9		**Requirements Traceability Document** Provide a current Requirements Traceability Document to cross-reference the information provided in the current requirements documents, Verification, Validation, and Acceptance Plan, and System Test Plan. Requirements traceability shall verify, at a minimum, the following: ▪ All capability-level requirements have been addressed by the system-level requirements ▪ All system-level requirements are justified by the capability-level requirements or otherwise approved (e.g. Requirements Review) ▪ All system-level requirements have associated verification activities in the VV&A Plan ▪ All verification activities specifically identified for each system-level requirement in the requirements documents have corresponding verification activities in the VV&A Plan ▪ All inspection and testing activities identified in the VV&A Plan are addressed in the System Test Plan ▪ All verification activities identified in the VV&A Plan that are not directly associated with a system-level requirement are reasonable and justifiable (e.g. code, standard, safety, or risk mitigation) Any system-level requirement that does not currently have associated verification activities identified in the VV&A Plan shall be clearly identified.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Requirements Traceability Document is desired, the Government will provide one upon request.	TG TS TSS XP*
7.1		**Project Schedule** Provide a current project schedule. Schedule shall include, at a minimum, the following: ▪ Timing and duration of planning activities ▪ Timing and duration of design activities ▪ Timing of each required design review or milestone ▪ Timing and duration of procurement activities ▪ Timing and duration of outages ▪ Timing and duration of fabrication activities ▪ Timing and duration of installation activities ▪ Timing and duration of verification activities ▪ Timing of project completion The schedule shall be exported directly from P6 or Microsoft Project. The schedule shall be a resource loaded schedule broken down to WBS Level 3 or better.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF, 11"X17" Format Location: Review Folder Format: Original File in Native File Format	AF PM
7.2		**Schedule Changes** Provide a summary of all significant changes to the schedule incorporated after the currently approved baseline schedule. A significant change shall be any change that impacts the overall schedule by more than 10% of the total schedule duration. If multiple schedule changes, in aggregate, impact the overall schedule by more than 10% of the total schedule duration, they may be identified as a single change.	Location: Presentation Format: List	AF PM
7.3		**Project Cost Estimate** Provide a current project cost estimate. Estimate shall include, at a minimum, all costs associated with the following: ▪ Engineered equipment (e.g. pumps, compressors, switchgear, or transformers) ▪ Commodity items (e.g. valves, fittings, enclosures, breakers, or fasteners) ▪ Commodity materials (e.g. pipe, tube, wire, cable, or structural materials) ▪ Specialty materials (e.g. specialty forgings, castings, or alloys) ▪ Expendable materials (e.g. welding rod or grinding wheels) ▪ Imposed surcharges or tariffs ▪ Design labor ▪ Fabrication labor ▪ Installation labor ▪ Verification labor ▪ Verification utilities ▪ Project Management The cost estimate shall be a detailed estimate broken down to WBS Level 3 or better.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
7.4		**Cost Estimate Changes** Provide a summary of all significant changes to the cost estimate incorporated after the currently approved baseline estimate. A significant change shall be any change that impacts the overall estimate by more than 10% of the total estimate. If multiple estimate changes, in aggregate, impact the overall estimate by more than 10% of the total estimate, they may be identified as a single change.	Location: Presentation Format: List	AF PM
7.5	**Programmatic Documentation**	**Risk Assessment Matrix** Provide a current Risk Assessment Matrix identifying all known risks associated with execution of the project in accordance with the proposed plans. Risk assessment shall include the following: ▪ All known risks that could significantly affect the technical solution ▪ All known risks that could significantly affect the project cost ▪ All known risks that could significantly affect the project schedule ▪ Any known or potential funding disconnects ▪ Likelihood of each listed risk ▪ Cost, schedule, or performance impact of each listed risk ▪ Potential mitigation activities for each listed risk ▪ When each identified mitigation activity will be implemented ▪ Adjusted likelihood and impact for each listed risk after mitigation	Location: Presentation Format: Summary Table with Link to File Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Risk Assessment Matrix is desired, the Government will provide one upon request.	TG XP*
7.6		**Hazard Tracking Log** 'Provide a current Hazard Tracking Log. Hazard Tracking Log shall identify the following: ▪ All known maintenance and operation hazards that could pose a threat to personnel, equipment, the environment, or operational capability ▪ System, subsystem, or component associated with the hazard ▪ Conditions or events that would cause the hazard ▪ Potential adverse effects as a result of the hazard ▪ Severity of the risks associated with the hazard ▪ Probability of the risks associated with the hazard ▪ Overall risk level associated with the hazard ▪ Potential risk reduction measures and mitigations	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS TSS

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7.7		**Environmental Impact Analysis** Provide all information required for an Environmental Impact Analysis (AF-813). Information shall include, but not be limited to, identification of potential effects relating to the following: ▪ Compatible Use / Land Use (e.g. noise, accident potential, or encroachment) ▪ Air Quality (e.g. emissions or state implementation plan) ▪ Water Resources (e.g. quality, quantity, or source) ▪ Safety / Occupational Health (e.g. asbestos, radiation, chemical exposure, expolsives, or wildlife) ▪ Hazardous Materials (e.g. use, storage, or generation) ▪ Biological Resources (e.g. wetlands, floodplains, or wildlife protection) ▪ Cultural Resources (e.g. burial, archaeological, or historical sites) ▪ Geology / Soil (e.g. topography, minerals, geothermal, seismicity, or installation restoration programs) ▪ Socioeconomic (e.g. employment projections, population projections, school impacts, or local fiscal impacts)	Location: Presentation Format: List If a **TEMPLATE** or **EXAMPLE** AF-813 is desired, the Government will provide one upon request.	AF PM
7.8		**Exit Criteria** Provide a list of all approved Exit Criteria.	Location: Presentation Format: Table or List	AF PM
7.9		**Entrance Criteria** Provide a list of Entrance Criteria for the next scheduled review. The list shall include the following: ▪ All Government-identified Entrance Criteria for the next scheduled review ▪ Requested deviations from the Entrance Criteria for the next scheduled review If no deviations are requested, this should be clearly stated.	Location: Presentation Format: Table or List	AF PM TG

EXIT CRITERIA	
Agreement that the proposed design solution and supporting information describes a product that will likely meet the technical requirements.	*Meeting Minutes Signed AEDC-1683 indicating Approval AEDC-1565 capturing Deficiencies and Action Items.
Agreement that the planned verification activities will likely prove the proposed design solution satisfies the technical requirements.	
Agreement that the proposed design solution and supporting information defines a product that is likely achievable within the defined cost and schedule.	
Agreement the technical performance, cost and schedule risks for the effort are likely acceptable.	
Agreement that the Entrance Criteria for the next review are acceptable.	

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INTERMEDIATE DESIGN REVIEW (IDR)

	ENTRANCE CRITERIA		WORK PRODUCTS TO BE DELIVERED BY CONTRACTOR	ACCEPTABLE FORMAT(S)	CONCURRENCE
Any required work product not provided for this review, or any work product not provided in the required state, shall have Government approval for the status of the product prior to commencing the review process. Documentation of Government approval shall be provided, clearly identifying the associated work product(s).					
1.1	Review Documentation		**Comments Log** Provide a Comments Log for this review. Comments Log shall include, at a minimum, the following: ▪ All reviewer provided comments ▪ Resolution or disposition for each comment ▪ Status of reviewer concurrance for each comment	Location: Review Folder Format: Excel Spreadsheet If a **TEMPLATE** or **EXAMPLE** Comment Log is desired, the Government will provide one upon request.	AF PM
1.2			**Deficiencies and Action Items.** Provide an updated status for all previous deficiencies and action items. Update shall include the following: ▪ Copy of the signed AEDC-1565 from the previous review ▪ Updated status for all deficiencies and action items listed All unresolved deficiencies or action items shall be clearly identified with documentation indiciating prior Government approval to move forward.	AEDC-1565 Location: Review Folder Format: PDF Status List Location: Presentation Format: Table	TG TS TSS
1.3			**Requirements Documents** Provide a copy of all requirements documents that have been used as the basis for this review. Documents shall include, at a minimum, the following: ▪ Statement of Objectives (SOO) and/or Performance Parameters (PP) ▪ Other Transaction Prototype Project Agreement (OTP) ▪ Contractor Derived Requirements All requirements documents shall include a revision designation or a date of approval to ensure accurate document control. Requirements documents shall be provided in the approved and unaltered state. Any proposed corrections, changes, or other revisions shall be provided separately. All approved changes to the requirements documents from the previous review shall be clearly identified.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
1.4			**Project Summary** Provide a brief project summary. Summary shall clearly identify, at a minimum, the following: ▪ Purpose of the project ▪ Current scope of the project ▪ Approvals requested as part of this review ▪ Waivers or deviations requested as part of this review ▪ Scope changes or clarifications requested as part of this review ▪ Requirements revisions or clarifications requested as part of this review	Location: Presentation Format: Narrative	AF PM
1.5			**Entrance Criteria** Provide a list of all required Entrance Criteria with mapping to the satisfying documentation. The list shall include the following: ▪ Identification of all approved Entrance Criteria for this review ▪ Acceptable location and format for each item listed ▪ Presentation slide or file intended to satisfy each item listed	Location: Presentation Format: Table	AF PM
1.6			**Deviations from Entrance Criteria** Provide a detailed list of requested deviations from the approved Entrance Critera. The list shall include the following: ▪ All Entrance Criteria that are not satisfied by the information presented at this review ▪ Verification of prior Government approval for the deviation (if previously approved) ▪ Requests for Government approval for the deviation (if not previously appoved)	Location: Presentation Format: List	TG
2.1		Design Update	**Summary of Changes** Provide a detailed summary of any significant design changes from the previous review. Significant design changes shall include, but are not limited to, changes to the following: ▪ General configuration ▪ Installation location ▪ Installation footprint ▪ Equipment size or capacity ▪ Fabrication method ▪ Materials of construction ▪ Structural loads ▪ Major equipment requirements Changes resulting in a significant increase in project cost or schedule shall be clearly identified.	Location: Presentation Format: List	AF PM
2.2		Basis of Design	**Assumptions** Provide a current list of all assumptions used in the development of the proposed solution. The list shall include, at a minimum, the following: ▪ What assumptions or approximations were made ▪ How each assumption or approximations was used ▪ Why each assumption or approximation is considered reasonable ▪ If and how each assumption or approximation will be verified All changes, including verified assumptions, from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Table or List *Links to additional files are acceptable if required to convey all known information.*	TG TS
2.3			**System Interface Diagram** Provide a current System Interface Diagram. The diagram shall identify all external systems that interface directly with the proposed system and shall include, at a minimum, the following: ▪ Clear identification of each interfacing system (e.g. process systems, hydraulic systems, data systems, control systems, electrical power) ▪ Direction of media, information, signal, or power flow between systems Any changes from the previous System Interface Diagram shall be clearly identified.	Location: Presentation Format: Block Diagram	TS

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2.4	**Design Approach**	**System Information**	**System Safety Features** Provide a current list of all expected system safety features that will be incorporated into the proposed solution to address identified operational hazards. The list shall include, at a minimum, the following: ▪ Safety features, components, or devices intended to protect personnel or equipment during operation (e.g. barriers, restrictions, or interlocks) ▪ Code-required safety devices (e.g. relief valves or breakers) ▪ Additional safety devices (e.g. temperature control systems or emergency shutdown buttons) If no special system safety features are required, this should be clearly stated. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: List	TS
2.5			**Operating Limits** Provide a current list of any identified safe operating limits for the system as proposed. Limits should address individual crtical parameters and may include, but not be limited to, the following: ▪ Minimum system supply (e.g. pressure or voltage) ▪ Maximum system discharge (e.g. pressure or voltage) ▪ Maximum capacity (e.g. flow rate or power) ▪ Controllable capacity range (e.g. flow rate or power) ▪ Maximum allowable losses associated with unknown or customer equipment (e.g. pressure loss or resistance) Identified limits should establish how far beyond the established design parameters the system is still capable of functioning using the proposed design. The limiting factor for each parameters should be identified (e.g. pressure rating, wall thickness, equipment capacity, cable size). All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: List	TS
2.6		**Work Environment**	**Site Plan** Provide a current Site Plan indicating where the work is to be performed. Site Plan shall include visual representations that identify, at a minimum, the following: ▪ Building or work area ▪ Where the building or area is located on the base ▪ Where within the building or area the work is to be performed ▪ Location and size of area required for installation ▪ Location of existing utilities relevant to the project (e.g. water, steam, natural gas, electrical conduits, high pressure air) ▪ Potential encroachment into Explosive Site Plans (ESP) or other known hazardous areas as identified by the Government Any changes from the previous Site Plan shall be clearly identified.	Location: Presentation Format: Images with Notation *Links to additional files are acceptable if required to convey all known information.*	TG
3.1		**Mechanical Design**	**Process System Schematics** Provide copies of all process system schematics and P&ID drawings required to clearly depict the design solution. Drawings shall include, at a minimum, the following: ▪ All applicable design conditions ▪ Applicable code(s) of construction ▪ Complete device list ▪ Relative locations of all equipment and devices in primary flow paths ▪ External system connections ▪ Line sizes and materials ▪ Operating notes and operating limitations All device identification numbers shall be in compliance with T-3 and coordinated with the device log as provided by the Government. Manufacturer and model number should be provided for all known devices, but is not required for devices or equipment that have not been awarded or selected. Procurement documentation to be used for procurement should be identified for all devices not currently awarded or selected, such as a data sheet or specification. All schematics required to clearly identify the proposed solution shall be provided in the Approved or later state. Any reference schematics or schematics for auxilliary systems may be provided in the Draft or later state.	Location: Presentation Format: Overview Image(s) with Notation Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS
3.2			**Mechanical Drawings** Provide copies of all drawings required to clearly depict the design solution. Drawings shall be sufficient to verify that the proposed solution is consistent with the provided analysis, sufficient to meet the current requirements, and can be installed in the available area and shall include, at a minimum, the following: ▪ General arrangement of the system ▪ Preliminary Bill of Materials ▪ Critical fabrication and/or installation details ▪ General location of maintenance and operation features ▪ General location of instrumentation connections ▪ Identification of information that is not shown on the current drawing that will be included in the final drawing Drawings shall include sufficient dimensions, including references to building walls, column lines, or other suitable reference points, to establish, at a minimum, the location of major components, including, but not limited to, the following: ▪ Control devices (e.g. control valves or flow restrictions) ▪ Flow measurement devices (e.g. flow meters or orifices) ▪ Configuration devices (e.g. primary isolation valves) ▪ Piping or equipment supports and support structures ▪ Major equipment (e.g. pumps, heat exchangers, or test equipment) All drawings required to clearly identify the proposed solution shall be in the Preliminary or later state. Additional reference or detail drawings may be in the Draft or later state.	Location: Presentation Format: Overview Image(s) with Notation Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS TSS

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3.3			**Mechanical Analysis** Provide analysis required to justify that the proposed design solution is viable. Analysis shall be sufficient to verify, at a minimum, the following: ▪ Solution is capable of satisfying the current requirements (e.g. flow analysis, equipment sizing calculations, or control device calculations) ▪ Solution is in compliance with the code(s) of construction (e.g. wall thickness calculations, relief device sizing, or stress analysis) ▪ Components and materials are suitable for use in the system (e.g. low temperature evaluations or chemical compatibility evaluations) All analysis shall be provided as a complete report, including clear identification of all inputs and evaluation methods and a clear and concise conclusion. Analysis shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS
3.4		**Structural Design**	**Structural Drawings** Provide copies of all drawings required to clearly depict the design solution. Drawings shall be sufficient to verify that the proposed solution is consistent with the provided analysis, sufficient to meet the current requirements, and can be installed in the available area and shall include, at a minimum, the following: ▪ General arrangement of the system ▪ Preliminary Bill of Materials ▪ Critical fabrication and/or installation details (e.g. method of construction) ▪ Identification of information that is not shown on the current drawing that will be included in the final drawing Drawings shall include sufficient dimensions, including references to building walls, column lines, or other suitable reference points, to establish, at a minimum, the size and location of the following: ▪ New or modified foundations ▪ New or modified support structures ▪ New or modified platforms and walkways All drawings required to clearly identify the proposed solution shall be in the Preliminary or later state. Additional reference or detail drawings may be in the Draft or later state.	Location: Presentation Format: Overview Image(s) with Notation Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC TSS
3.5			**Structural Analysis** Provide analysis required to justify that the proposed design solution is viable. Analysis shall be sufficient to verify, at a minimum, the following: ▪ Solution is capable of satisfying the current requirements ▪ Solution is in compliance with the code(s) of construction ▪ Buildings are capable of accomodating all applicable loads ▪ Foundations are capable of accomodating all applicable loads ▪ Support structures are capable of accomodating all applicable loads ▪ Components and materials are suitable for use in the system All analysis shall be provided as a complete report, including clear identification of all inputs and evaluation methods and a clear and concise conclusion. Analysis shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC
3.6	**Design Documentation**	**Electrical Power Design**	**Electrical Power Requirements** Provide a current list of electrical power requirements for the system. The list shall contain, but not be limited to, the following: ▪ Identification of powered equipment (e.g. heaters, turbines, refrigeration units, pump motors, valve actuator motors, or other process equipment) ▪ Identification of powered utilities and services (e.g. HVAC, lights, speakers, outlets, cranes, or other building utilities) ▪ Estimated power requirements for each piece of listed equipment (e.g. voltage and amperage) All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Table *Links to additional files are acceptable if required to convey all known information.*	TSDC
3.7			**Electrical Power Study** Provide an evaluation of the existing electrical infrastructure sufficient to identify all additions, repairs, replacements, or modifications required to support the proposed design. The evaluation shall contain, but not be limited to, the following: ▪ Potential electrical power source(s) for each item listed in the Electrical Power Requirements ▪ Available capacity for each potential electrical power source ▪ Electrical power equipment that must be added, repaired, replaced, or modified to support the proposed design.	Location: Presentation Format: Table *Links to additional files are acceptable if required to convey all known information.*	TSDC
3.8			**Electrical Line Diagrams** Provide copies of all electrical schematics, line diagrams, and loop diagrams required to clearly depict the design solution. Drawings shall include, at a minimum, the following: ▪ Powered devices and equipment ▪ Voltage and capacity of equipment and panels ▪ Connecting wire sizes ▪ Amperage for each conection ▪ External system connections and power sources ▪ Fabrication and installation notes and limitations ▪ Operating notes and limitations Line Diagrams shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC

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3.9		**Instrumentation & Controls Design**	**Input/Output Parameters** Provide a current list of I/O parameters required to accomodate all controls and instrumentation based on the provided schematics. For each parameter, the list shall identify, at a minimum, the following: ▪ Device type (e.g. flow meter, control valve, or pressure transmitter) ▪ Device name as shown on the process system schematic ▪ Device name as shown on the ID&C drawings ▪ The purpose of the I/O parameter ▪ If TMDE is required for the I/O point ▪ Parameter control or feedback signal types ▪ If the parameter can be locally controlled ▪ If the parameter can be remotely controlled, including identification of the intended control room or control system All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Table *Links to additional files are acceptable if required to convey all known information.*	TSDI
3.10			**Control Methodology** Provide a current narrative describing the high-level control methodology for the proposed solution. Control methodology shall consider all phases of operation, including startup and shutdown, and identify, at a minimum, the following: ▪ Devices, by name, to be controlled ▪ Control of method for each (e.g. manual or automatic) ▪ Control screen or location for all remotely controlled devices ▪ Instrumentation, by name, required for automated control ▪ Permissives or safety interlocks All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Narrative *Links to additional files are acceptable if required to convey all known information.*	TSDI
3.11			**Instrumentation and Controls Wiring Diagrams** Provide copies of all electrical schematics, line diagrams, and loop diagrams required to clearly depict the design solution. Drawings shall include, at a minimum, the following: ▪ All input, output, or interlock devices ▪ Display or control card for each device ▪ Wire connections and colors ▪ External system connections ▪ Fabrication and installation notes and limitations ▪ Operating notes and limitations Wiring diagrams shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDI
3.12		**Design Status**	**Design Drawing Status** Provide a current list of all schematics, P&ID drawings, line diagrams, fabrication drawings, and installation drawings that will be revised, created, or rendered obsolete as a result of the project, including all drawings that must be revised to provide or revise references. List shall include all mechanical, structural, electrical, and controls drawings. For each drawing, the list shall include, at a minimum, the following: ▪ Drawing number ▪ Drawing title ▪ Status of the drawing at the time of this review ▪ Status of the drawing recommended for the next review If there are no required drawings, this should be clearly stated. All drawings added to or removed from the list provided at the previous review shall be clearly identified.	Location: Presentation Format: Table	AF PM
3.13			**Analysis Status** Provide a current list of all analysis or calculation packages that will be created or revised as a result of the project. List shall include all mechanical, structural, electrical, and controls analysis. For each analysis or calculation package, the list shall include, at a minimum, the following: ▪ Calculation identification number ▪ Calculation title ▪ Status of the calculation at the time of this review ▪ Status of the calculation recommended for the next review If there is no required analysis, this should be clearly stated. All analysis added to or removed from the list provided at the previous review shall be clearly identified.	Location: Presentation Format: Table	AF PM

4.1	**Procurement Documentation**	**Procurement Planning**	**Procurement Documentation** Provide preliminary copies of all identified procurement documentation All procurement documentation shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM TG TS
4.2		**Procurement Status**	**Procurement Status** Provide a current list of all procurement documents, including data sheets, equipment specifications, statements of work, or statements of objectives, that will be created or revised as a result of the project. For each procurement document, the list shall include, at a minimum, the following: ▪ Document number ▪ Document title ▪ Status of the document at the time of this review ▪ Status of the document recommended for the next review. If there are no required procurement documents, this should be clearly stated. All procurement documents added to or removed from the list provided at the previous review shall be clearly identified.	Location: Presentation Format: Table	AF PM
4.3		**Early Procurements**	**Early Procurement Summary** Provide a current list of procurements that will require release or execution prior to completing the Critical Design Review in order to meet the required schedule or delivery date. For each procurement, the list shall identify, at a minimum, the following: ▪ Equipment or material to be procured ▪ Anticipated cost ▪ Anticipated delivery time ▪ Recommended procurement schedule or release date ▪ Justification for early procurement ▪ Potential risks due to early procurement ▪ Associated procurement documents (e.g. Data Sheet, Specification, SOW, SOO, or Advanced Release BOM) ▪ Schematics and design drawings required to support the procurement documentation ▪ Analysis and calculation reports required to support the procurement documentation If there are no recommended early procurements, this should be clearly stated. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Table *Links to additional files are acceptable if required to convey all known information.*	AF PM TG
4.4			**Procurement Readiness Review** For each procurement intended to be approved for immediate release as a result of this review, provide all documentation and information identified for a successful Procurement Readiness Review that is not otherwise required by the contents of this review. All procurement documentation shall be in the state required by the Procurement Readiness Review.	Per Procurement Readiness Review	AF PM TS
5.1	**Early Execution**		**Early Execution Summary** Provide a current list of execution tasks, including demoltion, fabrication, installation, or inspection, that will require execution or partial execution prior to completing the Critical Design Review in order to meet the required schedule or delivery date. For each task, the list shall identify, at a minimum, the following: ▪ Task or portion of a task to be executed ▪ Anticipated cost ▪ Recommended execution schedule ▪ Justification for early execution ▪ Potential risks due to early execution ▪ Materials required to support execution ▪ Demolition, fabrication, or installation drawings required to support execution If there are no recommended early execution tasks, this should be clearly stated. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: List *Links to additional files are acceptable if required to convey all known information.*	AF PM TG
5.2			**Execution Readiness Review** For each work task intended to be approved for immediate execution as a result of this review, provide all documentation and information identified for a successful Execution Readiness Review that is not otherwise required by the contents of this review. All procurement documentation shall be in the state required by the Execution Readiness Review.	Per Execution Readiness Review	AF PM TS
6.1			**Demolition Plan** Provide a current Demolition Plan. Plan shall include, at a minimum, the following: ▪ Scope of demolition effort, including all components or structures to be removed ▪ Demolition methods and how each will be used ▪ Site information (e.g. site conditions, existing equipment, or existing utilities) ▪ Required equipment or machinery ▪ How the remaining existing system will be isolated or reconnected ▪ How the system or structures will be supported or stabilized both during and after demolition ▪ Agreed upon location of laydown areas for removed equipment prior to disposal ▪ How and where the removed materials will be disposed of ▪ Outages and permits required ▪ Issues, concerns, or limitations associated with demolition (e.g. operations, maintenance, or testing impacts) All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Demolition Plan shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Demolition Plan is desired, the Government will provide one upon request.	AF PM

6.2		Execution Planning	**Manufacturing Plan** Provide a current Manufacturing Plan. Plan shall include, at a minimum, the following: ▪ Fabrication activities that will be performed ▪ Who will perform the work (e.g. shop or area craft) ▪ Crafts or specific skills required ▪ Site plan for field fabricaton ▪ Equipment, utilities, or facilities required ▪ Prerequisites required for fabrication (e.g. site preparation, training, or cetification) ▪ All equipment that must be procured or rented to support fabrication ▪ Inspection or testing activities required following fabrication ▪ Fabrication and delivery schedule ▪ Issues, concerns, or limitations associated with fabrication (e.g. operations, maintenance, or testing impacts) All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Manufacturing Plan shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Manufacturing Plan is desired, the Government will provide one upon request.	AF PM
6.3			**Installation Plan** Provide a current Installation Plan. Plan shall include, at a minimum, the following: ▪ Installation activities that will be performed ▪ Who will perform the work (e.g. shop or area craft) ▪ Crafts or specific skills required ▪ Equipment, utilities, or facilities required ▪ Site plan for locating large equipment (e.g. cranes or lifts) ▪ Prerequisites required for installation (e.g. site preparation, training, or cetification) ▪ Specific safety or security considerations associated with installation ▪ Identification of other areas and services affected by installation outage ▪ Installation schedule ▪ Issues, concerns, or limitations associated with installation (e.g. area, service, operations, maintenance, or testing impacts) All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Installation Plan shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Installation Plan is desired, the Government will provide one upon request.	AF PM
6.4		Operations Planning	**Concept of Operations** Provide a current Concept of Operations. CONOPS shall describe how the system is intended to be operated, including, at a minimum, the following: ▪ Operational environment (e.g. conditions, assumptions, constraints, or limitations) ▪ How the system is intended to operate, including expected operating conditions (NOT design conditions) ▪ Potential system configurations (e.g. startup, shutdown, maintenance, different users, or different sources) ▪ Detailed sequence required for reconfiguration (including valve names) ▪ Lock out-tag out requirements for major equipment The CONOPS shall account for all phases of operation, including checkout, pre-ops, operations, and post-ops. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. CONOPS shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Concept of Operations is desired, the Government will provide one upon request.	TS
6.5	Planning Documentation		**Operations and Maintenance Plan** Provide a current Operations and Maintenance Plan. Plan shall include, at a minimum, the following: ▪ Protective measures addressing safety, security, and environmental concerns, including mitigation of or protection from the operating environment (e.g. noise, heat, or humidity) ▪ Staffing required to operate the system, including number and qualifications ▪ Total cost of materials, utilities, and resources required to operate the system (e.g. cost per hour, cost per year, or cost per test) ▪ Required routine and preventative maintenance activities ▪ Staffing required to perform maintenance activities, including number and qualifications ▪ Total cost of labor, materials, utilities, and resources associated with each maintenance activity ▪ Frequency that each activity is expected to be performed ▪ Special tools that must be purchased or rented to operate or maintain the system ▪ Recommended spare parts All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Operations and Maintenance Plan shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** O&M Plan is desired, the Government will provide one upon request.	TSS TS
6.6			**Special Training Requirements** Provide a current list of special training requirements. The list shall identify, at a minimum, the following: ▪ What training is required ▪ Why the training is required ▪ Who is capable of providing the training If no special training is required, this should be clearly stated.	Location: Presentation Format: Table or List	TS TSS

6.7			**Failure Modes and Effects Analysis** Provide a current Failure Modes and Effects Analysis. FMEA shall address, at a minimum, the following: ▪ Failure modes that could result in a non-functional system ▪ Assess the likelihood and impact of each failure mode ▪ Mitigations that could be employed to limit the impact of each failure mode ▪ Assess the likelihood and impact of each mitigated failure mode All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. FMEA shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** FMEA is desired, the Government will provide one upon request.	TS
6.8		**Verification Planning**	**Verification, Validation, and Acceptance Plan** Provide a current Verification, Validation, and Acceptance Plan. Plan shall include all currently known information for the following: ▪ Verification and validation activities that will be performed as part of the project ▪ Type of verification or validation provided by each activity (e.g. analysis, inspection, demonstration, or testing) ▪ Why each verification or validation activity is required (e.g. associated project requirement(s), code, or standard) ▪ Acceptance criteria for each verification and validation activity ▪ Documentation to be provided for each activity to show that the acceptance criteria has been satisfied All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. VV&A Plan shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** VV&A Plan is desired, the Government will provide one upon request.	TG TS
6.9			**System Test Plan** Provide a current System Test Plan. Plan shall include, but not be limited to, all currently known information for the following: ▪ All inspection and testing activities identified in the VV&A Plan ▪ Activity in the VV&A Plan associated with each inspection or test activity ▪ Specific, step-by-step procedures or instructions that will govern how each activity will be performed (e.g. codes, standards, or work instructions) ▪ Objectives, assumptions, and prerequisites for each test. ▪ Who is responsible, by role, for each step of the test procedure ▪ Equipment and resources required to perform each activity When referencing outside codes and standards, the specific edition and section of the code or standard being reference should be clearly identified. When no existing codes, standards, or work instructions provide suitable procedures or instructions for conducting an identified inspection or testing activity, the System Test Plan shall provide detailed, step-by-step instructions for how the activity is to be performed. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. System Test Plan shall be in the Preliminary or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** STP is desired, the Government will provide one upon request.	TG TS
6.10			**Requirements Traceability Document** Provide a current Requirements Traceability Document to cross-reference the information provided in the current requirements documents, Verification, Validation, and Acceptance Plan, and System Test Plan. Requirements traceability shall verify, at a minimum, the following: ▪ All capability-level requirements have been addressed by the system-level requirements ▪ All system-level requirements are justified by the capability-level requirements or otherwise approved (e.g. Requirements Review) ▪ All system-level requirements have associated verification activities in the VV&A Plan ▪ All verification activities specifically identified for each system-level requirement in the requirements documents have corresponding verification activities in the VV&A Plan ▪ All inspection and testing activities identified in the VV&A Plan are addressed in the System Test Plan ▪ All verification activities identified in the VV&A Plan that are not directly associated with a system-level requirement are reasonable and justifiable (e.g. code, standard, safety, or risk mitigation) Any system-level requirement that does not currently have associated verification activities identified in the VV&A Plan shall be clearly identified.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Requirements Traceability Document is desired, the Government will provide one upon request.	TG TS TSS XP*
7.1			**Project Schedule** Provide a current project schedule. Schedule shall include, at a minimum, the following: ▪ Timing and duration of planning activities ▪ Timing and duration of design activities ▪ Timing of each required design review or milestone ▪ Timing and duration of procurement activities ▪ Timing and duration of outages ▪ Timing and duration of fabrication activities ▪ Timing and duration of installation activities ▪ Timing and duration of verification activities ▪ Timing of project completion The schedule shall be exported directly from P6 or Microsoft Project. The schedule shall be a resource loaded schedule broken down to WBS Level 3 or better.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF, 11"X17" Format Location: Review Folder Format: Original File in Native File Format	AF PM
7.2			**Schedule Changes** Provide a summary of all significant changes to the schedule incorporated after the currently approved baseline schedule. A significant change shall be any change that impacts the overall schedule by more than 10% of the total schedule duration. If multiple schedule changes, in aggregate, impact the overall schedule by more than 10% of the total schedule duration, they may be identified as a single change.	Location: Presentation Format: List	AF PM

7.3		**Project Cost Estimate** Provide a current project cost estimate. Estimate shall include, at a minimum, all costs associated with the following: ▪ Engineered equipment (e.g. pumps, compressors, switchgear, or transformers) ▪ Commodity items (e.g. valves, fittings, enclosures, breakers, or fasteners) ▪ Commodity materials (e.g. pipe, tube, wire, cable, or structural materials) ▪ Specialty materials (e.g. specialty forgings, castings, or alloys) ▪ Expendable materials (e.g. welding rod or grinding wheels) ▪ Imposed surcharges or tariffs ▪ Design labor ▪ Fabrication labor ▪ Installation labor ▪ Verification labor ▪ Verification utilities ▪ Project Management The cost estimate shall be a detailed estimate broken down to WBS Level 3 or better.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
7.4		**Cost Estimate Changes** Provide a summary of all significant changes to the cost estimate incorporated after the currently approved baseline estimate. A significant change shall be any change that impacts the overall estimate by more than 10% of the total estimate. If multiple estimate changes, in aggregate, impact the overall estimate by more than 10% of the total estimate, they may be identified as a single change.	Location: Presentation Format: List	AF PM
7.5	**Programmatic Documentation**	**Risk Assessment Matrix** Provide a current Risk Assessment Matrix identifying all known risks associated with execution of the project in accordance with the proposed plans. Risk assessment shall include the following: ▪ All known risks that could significantly affect the technical solution ▪ All known risks that could significantly affect the project cost ▪ All known risks that could significantly affect the project schedule ▪ Any known or potential funding disconnects ▪ Likelihood of each listed risk ▪ Cost, schedule, or performance impact of each listed risk ▪ Potential mitigation activities for each listed risk ▪ When each identified mitigation activity will be implemented ▪ Adjusted likelihood and impact for each listed risk after mitigation All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Summary Table with Link to File Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Risk Assessment Matrix is desired, the Government will provide one upon request.	TG XP*
7.6		**Hazard Tracking Log** Provide a current Hazard Tracking Log. Hazard Tracking Log shall identify the following: ▪ All known maintenance and operation hazards that could pose a threat to personnel, equipment, the environment, or operational capability ▪ System, subsystem, or component associated with the hazard ▪ Conditions or events that would cause the hazard ▪ Potential adverse effects as a result of the hazard ▪ Severity of the risks associated with the hazard ▪ Probability of the risks associated with the hazard ▪ Overall risk level associated with the hazard ▪ Potential risk reduction measures and mitigations ▪ Who is responsible for implementing each risk reduction measure or mitigation ▪ Who is responsible for ensuring safeguards are provided for remaining hazards ▪ How it will be verified that each hazard has been effectively controlled ▪ Severity of the risks associated with the hazard following mitigation ▪ Probability of the risks associated with the hazard following mitigation ▪ Overall risk level associated with the hazard following mitigation ▪ Hazard resolution status All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS TSS
7.7		**Exit Criteria** Provide a list of all approved Exit Criteria.	Location: Presentation Format: Table or List	AF PM
7.8		**Entrance Criteria** Provide a list of Entrance Criteria for the next scheduled review. The list shall include the following: ▪ All Government-identified Entrance Criteria for the next scheduled review ▪ Requested deviations from the Entrance Criteria for the next scheduled review If no deviations are requested, this should be clearly stated.	Location: Presentation Format: Table or List	AF PM TG

EXIT CRITERIA	
Agreement that the proposed design solution and supporting information describes a product that will likely meet the technical requirements.	*Meeting Minutes Signed AEDC-1683 indicating Approval AEDC-1565 capturing Deficiencies and Action Items.
Agreement that the planned verification activities will likely prove the proposed design solution satisfies the technical requirements.	
Agreement that the proposed design solution and supporting information defines a product that is likely achievable within the defined cost and schedule.	
Agreement the technical performance, cost and schedule risks for the effort are likely acceptable.	
Agreement that the Entrance Criteria for the next review are acceptable.	

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CRITICAL DESIGN REVIEW (CDR)					
	ENTRANCE CRITERIA		WORK PRODUCTS TO BE DELIVERED BY CONTRACTOR	ACCEPTABLE FORMAT(S)	CONCURRENCE
Any required work product not provided for this review, or any work product not provided in the required state, shall have Government approval for the status of the product prior to commencing the review process. Documentation of Government approval shall be provided, clearly identifying the associated work product(s).					
1.1	Review Documentation		**Comments Log** Provide a Comments Log for this review. Comments Log shall include, at a minimum, the following: ▪ All reviewer provided comments ▪ Resolution or disposition for each comment ▪ Status of reviewer concurrance for each comment	Location: Review Folder Format: Excel Spreadsheet If a **TEMPLATE** or **EXAMPLE** Comment Log is desired, the Government will provide one upon request.	AF PM
1.2	Review Documentation		**Deficiencies and Action Items.** Provide an updated status for all previous deficiencies and action items. Update shall include the following: ▪ Copy of the signed AEDC-1565 from the previous review ▪ Updated status for all deficiencies and action items listed All unresolved deficiencies or action items shall be clearly identified with documentation indiciating prior Government approval to move forward.	AEDC-1565 Location: Review Folder Format: PDF Status List Location: Presentation Format: Table	TG TS TSS
1.3	Review Documentation		**Requirements Documents** Provide a copy of all requirements documents that have been used as the basis for this review. Documents shall include, at a minimum, the following: ▪ Statement of Objectives (SOO) and/or Performance Parameters (PP) ▪ Other Transaction Prototype Project Agreement (OTP) ▪ Contractor Derived Requirements All requirements documents shall include a revision designation or a date of approval to ensure accurate document control. Requirements documents shall be provided in the approved and unaltered state. Any proposed corrections, changes, or other revisions shall be provided separately. All approved changes to the requirements documents from the previous review shall be clearly identified.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
1.4	Review Documentation		**Project Summary** Provide a brief project summary. Summary shall clearly identify, at a minimum, the following: ▪ Purpose of the project ▪ Current scope of the project ▪ Approvals requested as part of this review ▪ Waivers or deviations requested as part of this review ▪ Scope changes or clarifications requested as part of this review ▪ Requirements revisions or clarifications requested as part of this review	Location: Presentation Format: Narrative	AF PM
1.5	Review Documentation		**Entrance Criteria** Provide a list of all required Entrance Criteria with mapping to the satisfying documentation. The list shall include the following: ▪ Identification of all approved Entrance Criteria for this review ▪ Acceptable location and format for each item listed ▪ Presentation slide or file intended to satisfy each item listed	Location: Presentation Format: Table	AF PM
1.6	Review Documentation		**Deviations from Entrance Criteria** Provide a detailed list of requested deviations from the approved Entrance Critera. The list shall include the following: ▪ All Entrance Criteria that are not satisfied by the information presented at this review ▪ Verification of prior Government approval for the deviation (if previously approved) ▪ Requests for Government approval for the deviation (if not previously appoved)	Location: Presentation Format: List	TG
2.1	Review Documentation	Design Update	**Summary of Changes** Provide a detailed summary of any significant design changes from the previous review. Significant design changes shall include, but are not limited to, changes to the following: ▪ General configuration ▪ Installation location ▪ Installation footprint ▪ Equipment size or capacity ▪ Fabrication method ▪ Materials of construction ▪ Structural loads ▪ Major equipment requirements Changes resulting in a significant increase in project cost or schedule shall be clearly identified.	Location: Presentation Format: List	AF PM
2.2	Review Documentation	Basis of Design	**Assumptions** Provide a current list of all assumptions used in the development of the proposed solution. The list shall include, at a minimum, the following: ▪ What assumptions or approximations were made ▪ How each assumption or approximations was used ▪ Why each assumption or approximation is considered reasonable ▪ If and how each assumption or approximation will be verified All changes, including verified assumptions, from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Table or List *Links to additional files are acceptable if required to convey all known information.*	TG TS

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2.4	**Design Approach**		**System Safety Features** Provide a current list of all expected system safety features that will be incorporated into the proposed solution to address identified operational hazards. The list shall include, at a minimum, the following: ▪ Safety features, components, or devices intended to protect personnel or equipment during operation (e.g. barriers, restrictions, or interlocks) ▪ Code-required safety devices (e.g. relief valves or breakers) ▪ Additional safety devices (e.g. temperature control systems or emergency shutdown buttons) If no special system safety features are required, this should be clearly stated. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: List	TS
2.5		**System Information**	**Operating Limits** Provide a current list of any identified safe operating limits for the system as proposed. Limits should address individual crtical parameters and may include, but not be limited to, the following: ▪ Minimum system supply (e.g. pressure or voltage) ▪ Maximum system discharge (e.g. pressure or voltage) ▪ Maximum capacity (e.g. flow rate or power) ▪ Controllable capacity range (e.g. flow rate or power) ▪ Maximum allowable losses associated with unknown or customer equipment (e.g. pressure loss or resistance) Identified limits should establish how far beyond the established design parameters the system is still capable of functioning using the proposed design. The limiting factor for each parameters should be identified (e.g. pressure rating, wall thickness, equipment capacity, cable size). All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: List	TS
2.6		**Work Environment**	**Site Plan** Provide a current Site Plan indicating where the work is to be performed. Site Plan shall include visual representations that identify, at a minimum, the following: ▪ Building or work area ▪ Where the building or area is located on the base ▪ Where within the building or area the work is to be performed ▪ Location and size of area required for installation ▪ Location of existing utilities relevant to the project (e.g. water, steam, natural gas, electrical conduits, high pressure air) ▪ Potential encroachment into Explosive Site Plans (ESP) or other known hazardous areas as identified by the Government ▪ Location and size of laydown areas ▪ Location and size of areas reserved for trailers, storage, or other structures ▪ Location and size of areas reserved for temporary facilities (e.g. restrooms or break rooms) ▪ Location and size of areas reserved for large equipment (e.g. cranes) Any changes from the previous Site Plan shall be clearly identified.	Location: Presentation Format: Images with Notation *Links to additional files are acceptable if required to convey all known information.*	TG
3.1		**Mechanical Design**	**Process System Schematics** Provide copies of all identified process system schematics and P&ID drawings, including reference schematics and drawings. Drawings shall include, at a minimum, the following: ▪ All applicable design conditions ▪ Applicable code(s) of construction ▪ Complete device list ▪ Manufacturer and model number or associated procurement documentation for each device listed ▪ Relative locations of all equipment and devices in primary flow paths ▪ External system connections ▪ Line sizes and materials ▪ Operating notes and operating limitations All device identification numbers shall be in compliance with T-3 and coordinated with the device log. Schematics depicting the proposed solution shall be in the Approved or later state.	Location: Presentation Format: Overview Image(s) with Notation Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS
3.2			**Mechanical Drawings** Provide copies of all identifed drawings, including reference drawings. Drawings shall be sufficient to verify that the proposed solution is consistent with the provided analysis, sufficient to meet the current requirements, and can be installed in the available area and shall include, at a minimum, the following: ▪ All applicable design conditions ▪ Applicable code(s) of construction ▪ Detailed arrangement of the system, including the location of instrumentation connections and maintainenance and operation features ▪ Complete Bill of Materials sufficient to allow for procurement of all materials and components for which additional procurement documentation has not been provided ▪ Complete fabrication details, including detailed dimensions, sufficient to allow for fabrication of all non-commodity components in accordance with the design intent (e.g. material identificatoin, weld types, weld sizes, or heat treatment) ▪ Complete installation details, including detailed dimensions and references to building walls, column lines, or other suitable reference points, sufficient to allow for the system to be properly installed in accordance with the design intent (e.g. component identification, component orientations, bolt torques, or assembly procedures) ▪ Identification of all inspection and testing requirements to verify that the design, as identified on the drawing, is in compliance with the identified code(s) of construction (e.g. weld inspection, leak testing, or hydrostatic/pneumatic pressure test) ▪ Notes or instructions required to properly fabricate and/or install the system Drawings shall be in the Approved or later state.	Location: Presentation Format: Overview Image(s) with Notation Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS TSS

3.3			**Mechanical Analysis** Provide copies of all identified calculations and analysis. Analysis shall be sufficient to verify, at a minimum, the following: ▪ Solution is capable of satisfying the current requirements (e.g. flow analysis, equipment sizing calculations, or control device calculations) ▪ Solution is in compliance with the code(s) of construction (e.g. wall thickness calculations, relief device sizing, or stress analysis) ▪ Components and materials are suitable for use in the system (e.g. low temperature evaluations or chemical compatibility evaluations) All analysis shall be provided as a complete report, including clear identification of all inputs and evaluation methods and a clear and concise conclusion. Analysis reports shall be in the Approved or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS
3.4		**Structural Design**	**Structural Drawings** Provide copies of all identifed drawings, including reference drawings. Drawings shall be sufficient to verify that the proposed solution is consistent with the provided analysis, sufficient to meet the current requirements, and can be installed in the available area and shall include, at a minimum, the following: ▪ All applicable design loads ▪ Applicable code(s) of construction ▪ Detailed arrangement of the system ▪ Complete Bill of Materials sufficient to allow for procurement of all materials and components for which additional procurement documentation has not been provided ▪ Complete fabrication details, including detailed dimensions, sufficient to allow for fabrication of all non-commodity components in accordance with the design intent (e.g. material identificatoin, weld types, or weld sizes) ▪ Complete installation details, including detailed dimensions and references to building walls, column lines, or other suitable reference points, sufficient to allow for the system to be properly installed in accordance with the design intent (e.g. component identification or assembly procedures) ▪ Identification of all inspection and testing requirements to verify that the design, as identified on the drawing, is in compliance with the identified code(s) of construction (e.g. weld inspection or load testing) ▪ Notes or instructions required to properly fabricate and/or install the system Drawings shall be in the Approved or later state.	Location: Presentation Format: Overview Image(s) with Notation Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC TSS
3.5			**Structural Analysis** Provide copies of all identified calculations and analysis. Analysis shall be sufficient to verify, at a minimum, the following: ▪ Solution is capable of satisfying the current requirements ▪ Solution is in compliance with the code(s) of construction ▪ Buildings are capable of accomodating all applicable loads ▪ Foundations are capable of accomodating all applicable loads ▪ Support structures are capable of accomodating all applicable loads ▪ Components and materials are suitable for use in the system All analysis shall be provided as a complete report, including clear identification of all inputs and evaluation methods and a clear and concise conclusion. Analysis reports shall be in the Approved or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC
3.6		**Electrical Power Design**	**Electrical Power Requirements** Provide a current list of electrical power requirements for the system. The list shall contain, but not be limited to, the following: ▪ Identification of powered equipment (e.g. heaters, turbines, refrigeration units, pump motors, valve actuator motors, or other process equipment) ▪ Identification of powered utilities and services (e.g. HVAC, lights, speakers, outlets, cranes, or other building utilities) ▪ Estimated power requirements for each piece of listed equipment (e.g. voltage and amperage) ▪ Identified of power sources for each piece of powered equipment ▪ Additional equipment or infrastructure required to accomodate power requirements All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Table *Links to additional files are acceptable if required to convey all known information.*	TSDC
3.7			**Electrical Line Diagrams** Provide copies of all electrical schematics, line diagrams, and loop diagrams required to clearly depict the design solution. Drawings shall include, at a minimum, the following: ▪ Powered devices and equipment ▪ Voltage and capacity of equipment and panels ▪ Connecting wire sizes ▪ Amperage for each conection ▪ External system connections and power sources ▪ Fabrication and installation notes and limitations ▪ Operating notes and limitations Line Diagrams shall be in the Approved or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC
3.8	**Design Documentation**		**Electrical Drawings** Provide copies of all identifed fabrication and installation drawings, including reference drawings. Drawings shall be sufficient to verify that the proposed solution is consistent with the provided analysis, sufficient to meet the current requirements, and can be installed in the available area and shall include, at a minimum, the following: ▪ Complete Bill of Materials sufficient to allow for procurement of all materials and components for which additional procurement documentation has not been provided ▪ Complete fabrication details, including detailed dimensions, sufficient to allow for fabrication of all non-commodity components in accordance with the design intent (e.g. material identificatoin, weld types, weld sizes, or heat treatment) ▪ Complete installation details, including detailed dimensions and references to building walls, column lines, or other suitable reference points, sufficient to allow for the system to be properly installed in accordance with the design intent (e.g. component identification, component orientations, bolt torques, or assembly procedures) ▪ Notes or instructions required to properly fabricate and/or install the system Drawings shall be in the Approved or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC

3.9			**Electrical Analysis** Provide copies of all identified calculations and analysis. Analysis shall be sufficient to verify, at a minimum, the following: ▪ Solution is capable of satisfying the current requirements (e.g. equipment sizing calculations or wire sizing calculations) ▪ Solution is in compliance with the code(s) of construction (e.g. breaker sizing calculations or thermal calculations) ▪ Components and materials are suitable for use in the system (e.g. low temperature evaluations or chemical compatibility evaluations) All analysis shall be provided as a complete report, including clear identification of all inputs and evaluation methods and a clear and concise conclusion. Analysis reports shall be in the Approved or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC
3.10		**Instrumentation & Controls Design**	**Input/Output Parameters** Provide a current list of I/O parameters required to accomodate all controls and instrumentation based on the provided schematics. For each parameter, the list shall identify, at a minimum, the following: ▪ Device type (e.g. flow meter, control valve, or pressure transmitter) ▪ Device name as shown on the process system schematic ▪ Device name as shown on the ID&C drawings ▪ The purpose of the I/O parameter ▪ If TMDE is required for the I/O point ▪ Parameter control or feedback signal types ▪ If the parameter can be locally controlled ▪ If the parameter can be remotely controlled, including identification of the intended control room or control system All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Table *Links to additional files are acceptable if required to convey all known information.*	TSDI
3.11			**Control Methodology** Provide a current narrative describing the high-level control methodology for the proposed solution. Control methodology shall consider all phases of operation, including startup and shutdown, and identify, at a minimum, the following: ▪ Devices, by name, to be controlled ▪ Control of method for each (e.g. manual or automatic) ▪ Control screen or location for all remotely controlled devices ▪ Instrumentation, by name, required for automated control ▪ Permissives or safety interlocks All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Narrative *Links to additional files are acceptable if required to convey all known information.*	TSDI
3.12			**Human-Machine Interface** Provide mock-up or red-lined HMI screens for all instrumentation and controls that will be displayed in a control room.	Location: Presentation Format: Image(s) *Links to additional files are acceptable if required to convey all known information.*	TS TSDI
3.13			**Instrumentation and Controls Wiring Diagrams** Provide copies of all electrical schematics, line diagrams, and loop diagrams required to clearly depict the design solution. Drawings shall include, at a minimum, the following: ▪ All input, output, or interlock devices ▪ Display or control card for each device ▪ Wire connections and colors ▪ External system connections ▪ Fabrication and installation notes and limitations ▪ Operating notes and limitations Wiring diagrams shall be in the Approved or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDI
3.14			**Instrumentation and Controls Drawings** Provide copies of all identifed fabrication and installation drawings, including reference drawings. Drawings shall be sufficient to verify that the proposed solution is consistent with the provided analysis, sufficient to meet the current requirements, and can be installed in the available area and shall include, at a minimum, the following: ▪ Complete Bill of Materials sufficient to allow for procurement of all materials and components for which additional procurement documentation has not been provided ▪ Complete fabrication details, including detailed dimensions, sufficient to allow for fabrication of all non-commodity components in accordance with the design intent (e.g. material identificatoin, weld types, weld sizes, or heat treatment) ▪ Complete installation details, including detailed dimensions and references to building walls, column lines, or other suitable reference points, sufficient to allow for the system to be properly installed in accordance with the design intent (e.g. component identification, component orientations, bolt torques, or assembly procedures) ▪ Notes or instructions required to properly fabricate and/or install the system Drawings shall be in the Approved or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDI

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3.15		**Design Status**	**Design Drawing Status** Provide a current list of all schematics, P&ID drawings, line diagrams, fabrication drawings, and installation drawings revised, created, or rendered obsolete as a result of the project, including all drawings that must be revised to provide or revise references. List shall include all mechanical, structural, electrical, and controls drawings. For each drawing, the list shall include, at a minimum, the following: ▪ Drawing number ▪ Drawing title ▪ Status of the drawing at the time of this review If there are no required drawings, this should be clearly stated. All drawings added to or removed from the list provided at the previous review shall be clearly identified.	Location: Presentation Format: Table	AF PM
3.16			**Analysis Status** Provide a current list of all analysis or calculation packages created or revised as a result of the project. List shall include all mechanical, structural, electrical, and controls analysis. For each analysis or calculation package, the list shall include, at a minimum, the following: ▪ Calculation identification number ▪ Calculation title ▪ Status of the calculation at the time of this review If there is no required analysis, this should be clearly stated. All analysis added to or removed from the list provided at the previous review shall be clearly identified.	Location: Presentation Format: Table	AF PM
4.1	**Procurement Documentation**	**Procurement Planning**	**Procurement Documentation** Provide preliminary copies of all identified procurement documentation Procurement documentation shall be in the Approved or later state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM TG TS
4.2		**Procurement Status**	**Procurement Status** Provide a current list of all procurement documents, including data sheets, equipment specifications, statements of work, or statements of objectives, created or revised as a result of the project. For each procurement document, the list shall include, at a minimum, the following: ▪ Document number ▪ Document title ▪ Status of the document at the time of this review If there are no required procurement documents, this should be clearly stated. All procurement documents added to or removed from the list provided at the previous review shall be clearly identified.	Location: Presentation Format: Table	AF PM
5.1		**Execution Planning**	**Demolition Plan** Provide a current Demolition Plan. Plan shall include, at a minimum, the following: ▪ Scope of demolition effort, including all components or structures to be removed ▪ Demolition methods and how each will be used ▪ Site information (e.g. site conditions, existing equipment, or existing utilities) ▪ Required equipment or machinery ▪ How the remaining existing system will be isolated or reconnected ▪ How the system or structures will be supported or stabilized both during and after demolition ▪ Agreed upon location of laydown areas for removed equipment prior to disposal ▪ How and where the removed materials will be disposed of ▪ Outages and permits required ▪ Issues, concerns, or limitations associated with demolition (e.g. operations, maintenance, or testing impacts) All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Demolition Plan shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Demolition Plan is desired, the Government will provide one upon request.	AF PM
5.2			**Manufacturing Plan** Provide a current Manufacturing Plan. Plan shall include, at a minimum, the following: ▪ Fabrication activities that will be performed ▪ Who will perform the work (e.g. shop or area craft) ▪ Crafts or specific skills required ▪ Site plan for field fabricaton ▪ Equipment, utilities, or facilities required ▪ Prerequisites required for fabrication (e.g. site preparation, training, or cetification) ▪ All equipment that must be procured or rented to support fabrication ▪ Inspection or testing activities required following fabrication ▪ Fabrication and delivery schedule ▪ Issues, concerns, or limitations associated with fabrication (e.g. operations, maintenance, or testing impacts) All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Manufacturing Plan shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Manufacturing Plan is desired, the Government will provide one upon request.	AF PM

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5.3			**Installation Plan** Provide a current Installation Plan. Plan shall include, at a minimum, the following: ▪ Installation activities that will be performed ▪ Who will perform the work (e.g. shop or area craft) ▪ Crafts or specific skills required ▪ Equipment, utilities, or facilities required ▪ Site plan for locating large equipment (e.g. cranes or lifts) ▪ Prerequisites required for installation (e.g. site preparation, training, or cetification) ▪ Specific safety or security considerations associated with installation ▪ Identification of other areas and services affected by installation outage ▪ Installation schedule ▪ Issues, concerns, or limitations associated with installation (e.g. area, service, operations, maintenance, or testing impacts) All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Installation Plan shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Installation Plan is desired, the Government will provide one upon request.	AF PM
5.4			**Concept of Operations** Provide a current Concept of Operations. CONOPS shall describe how the system is intended to be operated, including, at a minimum, the following: ▪ Operational environment (e.g. conditions, assumptions, constraints, or limitations) ▪ How the system is intended to operate, including expected operating conditions (NOT design conditions) ▪ Potential system configurations (e.g. startup, shutdown, maintenance, different users, or different sources) ▪ Detailed sequence required for reconfiguration (including valve names) ▪ Lock out-tag out requirements for major equipment The CONOPS shall account for all phases of operation, including checkout, pre-ops, operations, and post-ops. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. CONOPS shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Concept of Operations is desired, the Government will provide one upon request.	TS
5.5	**Planning Documentation**	**Operations Planning**	**Operations and Maintenance Plan** Provide a current Operations and Maintenance Plan. Plan shall include, at a minimum, the following: ▪ Protective measures addressing safety, security, and environmental concerns, including mitigation of or protection from the operating environment (e.g. noise, heat, or humidity) ▪ Staffing required to operate the system, including number and qualifications ▪ Total cost of materials, utilities, and resources required to operate the system (e.g. cost per hour, cost per year, or cost per test) ▪ Required routine and preventative maintenance activities ▪ Staffing required to perform maintenance activities, including number and qualifications ▪ Total cost of labor, materials, utilities, and resources associated with each maintenance activity ▪ Frequency that each activity is expected to be performed ▪ Special tools that must be purchased or rented to operate or maintain the system ▪ Recommended spare parts All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Operations and Maintenance Plan shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** O&M Plan is desired, the Government will provide one upon request.	TSS TS
5.6			**Special Training Requirements** Provide a current list of special training requirements. The list shall identify, at a minimum, the following: ▪ What training is required ▪ Why the training is required ▪ Who is capable of providing the training If no special training is required, this should be clearly stated. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Table or List	TS TSS
5.7			**Failure Modes and Effects Analysis** Provide a current Failure Modes and Effects Analysis. FMEA shall address, at a minimum, the following: ▪ Failure modes that could result in a non-functional system ▪ Assess the likelihood and impact of each failure mode ▪ Mitigations that could be employed to limit the impact of each failure mode ▪ Assess the likelihood and impact of each mitigated failure mode All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. FMEA shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** FMEA is desired, the Government will provide one upon request.	TS

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5.8			**Verification, Validation, and Acceptance Plan** Provide a current Verification, Validation, and Acceptance Plan. Plan shall include all currently known information for the following: ▪ Verification and validation activities that will be performed as part of the project ▪ Type of verification or validation provided by each activity (e.g. analysis, inspection, demonstration, or testing) ▪ Why each verification or validation activity is required (e.g. associated project requirement(s), code, or standard) ▪ Acceptance criteria for each verification and validation activity ▪ Documentation to be provided for each activity to show that the acceptance criteria has been satisfied All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. VV&A Plan shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** VV&A Plan is desired, the Government will provide one upon request.	TG TS
5.9		**Verification Planning**	**System Test Plan** Provide a current System Test Plan. Plan shall include, but not be limited to, all currently known information for the following: ▪ All inspection and testing activities identified in the VV&A Plan ▪ Activity in the VV&A Plan associated with each inspection or test activity ▪ Specific, step-by-step procedures or instructions that will govern how each activity will be performed (e.g. codes, standards, or work instructions) ▪ Objectives, assumptions, and prerequisites for each test. ▪ Who is responsible, by role, for each step of the test procedure ▪ Equipment and resources required to perform each activity When referencing outside codes and standards, the specific edition and section of the code or standard being reference should be clearly identified. When no existing codes, standards, or work instructions provide suitable procedures or instructions for conducting an identified inspection or testing activity, the System Test Plan shall provide detailed, step-by-step instructions for how the activity is to be performed. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. System Test Plan shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** STP is desired, the Government will provide one upon request.	TG TS
5.10			**Requirements Traceability Document** Provide a current Requirements Traceability Document to cross-reference the information provided in the current requirements documents, Verification, Validation, and Acceptance Plan, and System Test Plan. Requirements traceability shall verify, at a minimum, the following: ▪ All capability-level requirements have been addressed by the system-level requirements ▪ All system-level requirements are justified by the capability-level requirements or otherwise approved (e.g. Requirements Review) ▪ All system-level requirements have associated verification activities in the VV&A Plan ▪ All verification activities specifically identified for each system-level requirement in the requirements documents have corresponding verification activities in the VV&A Plan ▪ All inspection and testing activities identified in the VV&A Plan are addressed in the System Test Plan ▪ All verification activities identified in the VV&A Plan that are not directly associated with a system-level requirement are reasonable and justifiable (e.g. code, standard, safety, or risk mitigation) Any system-level requirement that does not currently have associated verification activities identified in the VV&A Plan shall be clearly identified.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Requirements Traceability Document is desired, the Government will provide one upon request.	TG TS TSS XP*
6.1			**Project Schedule** Provide a current project schedule. Schedule shall include, at a minimum, the following: ▪ Timing and duration of planning activities ▪ Timing and duration of design activities ▪ Timing of each required design review or milestone ▪ Timing and duration of procurement activities ▪ Timing and duration of outages ▪ Timing and duration of fabrication activities ▪ Timing and duration of installation activities ▪ Timing and duration of verification activities ▪ Timing of project completion The schedule shall be exported directly from P6 or Microsoft Project. The schedule shall be a resource loaded schedule broken down to WBS Level 3 or better.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF, 11"X17" Format Location: Review Folder Format: Original File in Native File Format	AF PM
6.2			**Schedule Changes** Provide a summary of all significant changes to the schedule incorporated after the currently approved baseline schedule. A significant change shall be any change that impacts the overall schedule by more than 10% of the total schedule duration. If multiple schedule changes, in aggregate, impact the overall schedule by more than 10% of the total schedule duration, they may be identified as a single change.	Location: Presentation Format: List	AF PM

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6.3		**Project Cost Estimate** Provide a current project cost estimate. Estimate shall include, at a minimum, all costs associated with the following: ▪ Engineered equipment (e.g. pumps, compressors, switchgear, or transformers) ▪ Commodity items (e.g. valves, fittings, enclosures, breakers, or fasteners) ▪ Commodity materials (e.g. pipe, tube, wire, cable, or structural materials) ▪ Specialty materials (e.g. specialty forgings, castings, or alloys) ▪ Expendable materials (e.g. welding rod or grinding wheels) ▪ Imposed surcharges or tariffs ▪ Design labor ▪ Fabrication labor ▪ Installation labor ▪ Verification labor ▪ Verification utilities ▪ Project Management The cost estimate shall be a detailed estimate broken down to WBS Level 3 or better.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
6.4		**Cost Estimate Changes** Provide a summary of all significant changes to the cost estimate incorporated after the currently approved baseline estimate. A significant change shall be any change that impacts the overall estimate by more than 10% of the total estimate. If multiple estimate changes, in aggregate, impact the overall estimate by more than 10% of the total estimate, they may be identified as a single change.	Location: Presentation Format: List	AF PM
6.5	**Programmatic Documentation**	**Risk Assessment Matrix** Provide a current Risk Assessment Matrix identifying all known risks associated with execution of the project in accordance with the proposed plans. Risk assessment shall include the following: ▪ All known risks that could significantly affect the technical solution ▪ All known risks that could significantly affect the project cost ▪ All known risks that could significantly affect the project schedule ▪ Any known or potential funding disconnects ▪ Likelihood of each listed risk ▪ Cost, schedule, or performance impact of each listed risk ▪ Potential mitigation activities for each listed risk ▪ When each identified mitigation activity will be implemented ▪ Adjusted likelihood and impact for each listed risk after mitigation All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Summary Table with Link to File Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Risk Assessment Matrix is desired, the Government will provide one upon request.	TG XP*
6.6		**Hazard Tracking Log** Provide a current Hazard Tracking Log. Hazard Tracking Log shall identify the following: ▪ Maintenance and operation hazards that could pose a threat to personnel, equipment, the environment, or operational capability ▪ System, subsystem, or component associated with the hazard ▪ Conditions or events that would cause the hazard ▪ Potential adverse effects as a result of the hazard ▪ Severity of the risks associated with the hazard ▪ Probability of the risks associated with the hazard ▪ Overall risk level associated with the hazard ▪ Potential risk reduction measures and mitigations ▪ Who is responsible for implementing each risk reduction measure or mitigation ▪ Who is responsible for ensuring safeguards are provided for remaining hazards ▪ How it will be verified that each hazard has been effectively controlled ▪ Severity of the risks associated with the hazard following mitigation ▪ Probability of the risks associated with the hazard following mitigation ▪ Overall risk level associated with the hazard following mitigation ▪ Hazard resolution status All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS TSS
6.7		**Exit Criteria** Provide a list of all approved Exit Criteria.	Location: Presentation Format: Table or List	AF PM
6.8		**Entrance Criteria** Provide a list of Entrance Criteria for the next scheduled review. The list shall include the following: ▪ All Government-identified Entrance Criteria for the next scheduled review ▪ Requested deviations from the Entrance Criteria for the next scheduled review If no deviations are requested, this should be clearly stated.	Location: Presentation Format: Table or List	AF PM TG

EXIT CRITERIA	
Agreement that the proposed design solution and supporting information describes a product that will meet the technical requirements.	*Meeting Minutes Signed AEDC-1683 indicating Approval AEDC-1565 capturing Deficiencies and Action Items.
Agreement that the planned verification activities will prove the proposed design solution satisfies the technical requirements.	
Agreement that the proposed design solution and supporting information defines a product that is achievable within the defined cost and schedule.	
Agreement the technical performance, cost and schedule risks for the effort are acceptable.	
Agreement that the Entrance Criteria for the next review are acceptable.	

FINAL DESIGN REVIEW (FDR)					
	ENTRANCE CRITERIA		WORK PRODUCTS TO BE DELIVERED BY CONTRACTOR	ACCEPTABLE FORMAT(S)	CONCURRENCE
Any required work product not provided for this review, or any work product not provided in the required state, shall have Government approval for the status of the product prior to commencing the review process. Documentation of Government approval shall be provided, clearly identifying the associated work product(s).					
1.1			**Comments Log** Provide a Comments Log for this review. Comments Log shall include, at a minimum, the following: ▪ All reviewer provided comments ▪ Resolution or disposition for each comment ▪ Status of reviewer concurrance for each comment	Location: Review Folder Format: Excel Spreadsheet If a **TEMPLATE** or **EXAMPLE** Comment Log is desired, the Government will provide one upon request.	AF PM
1.2	**Review Documentation**		**Deficiencies and Action Items.** Provide an updated status for all previous deficiencies and action items. Update shall include the following: ▪ Copy of the signed AEDC-1565 from the previous review ▪ Updated status for all deficiencies and action items listed All unresolved deficiencies or action items shall be clearly identified with documentation indiciating prior Government approval to move forward.	AEDC-1565 Location: Review Folder Format: PDF Status List Location: Presentation Format: Table	TG TS TSS
1.3			**Entrance Criteria** Provide a list of all required Entrance Criteria with mapping to the satisfying documentation. The list shall include the following: ▪ Identification of all approved Entrance Criteria for this review ▪ Acceptable location and format for each item listed ▪ Presentation slide or file intended to satisfy each item listed	Location: Presentation Format: Table	AF PM
2.1		**Mechanical Design**	**Process System Schematics** Provide copies of all identified process system schematics and P&ID drawings, including reference schematics and drawings. Drawings shall include, at a minimum, the following: ▪ All applicable design conditions ▪ Applicable code(s) of construction ▪ Complete device list ▪ Manufacturer and model number or associated procurement documentation for each device listed ▪ Relative locations of all equipment and devices in primary flow paths ▪ External system connections ▪ Line sizes and materials ▪ Operating notes and operating limitations All device identification numbers shall be in compliance with T-3 and coordinated with the device log. Schematics depicting the proposed solution shall be in the Final state.	Location: Presentation Format: Overview Image(s) with Notation Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS
2.2			**Mechanical Drawings** Provide copies of all identifed drawings, including reference drawings. Drawings shall be sufficient to verify that the proposed solution is consistent with the provided analysis, sufficient to meet the current requirements, and can be installed in the available area and shall include, at a minimum, the following: ▪ All applicable design conditions ▪ Applicable code(s) of construction ▪ Detailed arrangement of the system, including the location of instrumentation connections and maintainenance and operation features ▪ Complete Bill of Materials sufficient to allow for procurement of all materials and components for which additional procurement documentation has not been provided ▪ Complete fabrication details, including detailed dimensions, sufficient to allow for fabrication of all non-commodity components in accordance with the design intent (e.g. material identificatoin, weld types, weld sizes, or heat treatment) ▪ Complete installation details, including detailed dimensions and references to building walls, column lines, or other suitable reference points, sufficient to allow for the system to be properly installed in accordance with the design intent (e.g. component identification, component orientations, bolt torques, or assembly procedures) ▪ Identification of all inspection and testing requirements to verify that the design, as identified on the drawing, is in compliance with the identified code(s) of construction (e.g. weld inspection, leak testing, or hydrostatic/pneumatic pressure test) ▪ Notes or instructions required to properly fabricate and/or install the system Drawings shall be in the Final state.	Location: Presentation Format: Overview Image(s) with Notation Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS TSS
2.3			**Mechanical Analysis** Provide copies of all identified calculations and analysis. Analysis shall be sufficient to verify, at a minimum, the following: ▪ Solution is capable of satisfying the current requirements (e.g. flow analysis, equipment sizing calculations, or control device calculations) ▪ Solution is in compliance with the code(s) of construction (e.g. wall thickness calculations, relief device sizing, or stress analysis) ▪ Components and materials are suitable for use in the system (e.g. low temperature evaluations or chemical compatibility evaluations) All analysis shall be provided as a complete report, including clear identification of all inputs and evaluation methods and a clear and concise conclusion. Analysis reports shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS

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2.4	**Design Documentation**	**Structural Design**	**Structural Drawings** Provide copies of all identifed drawings, including reference drawings. Drawings shall be sufficient to verify that the proposed solution is consistent with the provided analysis, sufficient to meet the current requirements, and can be installed in the available area and shall include, at a minimum, the following: ▪ All applicable design loads ▪ Applicable code(s) of construction ▪ Detailed arrangement of the system ▪ Complete Bill of Materials sufficient to allow for procurement of all materials and components for which additional procurement documentation has not been provided ▪ Complete fabrication details, including detailed dimensions, sufficient to allow for fabrication of all non-commodity components in accordance with the design intent (e.g. material identificatoin, weld types, or weld sizes) ▪ Complete installation details, including detailed dimensions and references to building walls, column lines, or other suitable reference points, sufficient to allow for the system to be properly installed in accordance with the design intent (e.g. component identification or assembly procedures) ▪ Identification of all inspection and testing requirements to verify that the design, as identified on the drawing, is in compliance with the identified code(s) of construction (e.g. weld inspection or load testing) ▪ Notes or instructions required to properly fabricate and/or install the system Drawings shall be in the Final state.	Location: Presentation Format: Overview Image(s) with Notation Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC TSS
2.5			**Structural Analysis** Provide copies of all identified calculations and analysis. Analysis shall be sufficient to verify, at a minimum, the following: ▪ Solution is capable of satisfying the current requirements ▪ Solution is in compliance with the code(s) of construction ▪ Buildings are capable of accomodating all applicable loads ▪ Foundations are capable of accomodating all applicable loads ▪ Support structures are capable of accomodating all applicable loads ▪ Components and materials are suitable for use in the system All analysis shall be provided as a complete report, including clear identification of all inputs and evaluation methods and a clear and concise conclusion. Analysis reports shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC
2.6		**Electrical Power Design**	**Electrical Line Diagrams** Provide copies of all electrical schematics, line diagrams, and loop diagrams required to clearly depict the design solution. Drawings shall include, at a minimum, the following: ▪ Powered devices and equipment ▪ Voltage and capacity of equipment and panels ▪ Connecting wire sizes ▪ Amperage for each conection ▪ External system connections and power sources ▪ Fabrication and installation notes and limitations ▪ Operating notes and limitations Line Diagrams shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC
2.7			**Electrical Drawings** Provide copies of all identifed fabrication and installation drawings, including reference drawings. Drawings shall be sufficient to verify that the proposed solution is consistent with the provided analysis, sufficient to meet the current requirements, and can be installed in the available area and shall include, at a minimum, the following: ▪ Complete Bill of Materials sufficient to allow for procurement of all materials and components for which additional procurement documentation has not been provided ▪ Complete fabrication details, including detailed dimensions, sufficient to allow for fabrication of all non-commodity components in accordance with the design intent (e.g. material identificatoin, weld types, weld sizes, or heat treatment) ▪ Complete installation details, including detailed dimensions and references to building walls, column lines, or other suitable reference points, sufficient to allow for the system to be properly installed in accordance with the design intent (e.g. component identification, component orientations, bolt torques, or assembly procedures) ▪ Notes or instructions required to properly fabricate and/or install the system Drawings shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC
2.8			**Electrical Analysis** Provide copies of all identified calculations and analysis. Analysis shall be sufficient to verify, at a minimum, the following: ▪ Solution is capable of satisfying the current requirements (e.g. equipment sizing calculations or wire sizing calculations) ▪ Solution is in compliance with the code(s) of construction (e.g. breaker sizing calculations or thermal calculations) ▪ Components and materials are suitable for use in the system (e.g. low temperature evaluations or chemical compatibility evaluations) All analysis shall be provided as a complete report, including clear identification of all inputs and evaluation methods and a clear and concise conclusion. Analysis reports shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDC

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2.9		**Instrumentation & Controls Design**	**Instrumentation and Controls Wiring Diagrams** Provide copies of all electrical schematics, line diagrams, and loop diagrams required to clearly depict the design solution. Drawings shall include, at a minimum, the following: ▪ All input, output, or interlock devices ▪ Display or control card for each device ▪ Wire connections and colors ▪ External system connections ▪ Fabrication and installation notes and limitations ▪ Operating notes and limitations Wiring diagrams shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDI
2.10			**Instrumentation and Controls Drawings** Provide copies of all identifed fabrication and installation drawings, including reference drawings. Drawings shall be sufficient to verify that the proposed solution is consistent with the provided analysis, sufficient to meet the current requirements, and can be installed in the available area and shall include, at a minimum, the following: ▪ Complete Bill of Materials sufficient to allow for procurement of all materials and components for which additional procurement documentation has not been provided ▪ Complete fabrication details, including detailed dimensions, sufficient to allow for fabrication of all non-commodity components in accordance with the design intent (e.g. material identificatoin, weld types, weld sizes, or heat treatment) ▪ Complete installation details, including detailed dimensions and references to building walls, column lines, or other suitable reference points, sufficient to allow for the system to be properly installed in accordance with the design intent (e.g. component identification, component orientations, bolt torques, or assembly procedures) ▪ Notes or instructions required to properly fabricate and/or install the system Drawings shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TSDI
2.11		**Procurement**	**Procurement Documentation** Provide preliminary copies of all identified procurement documentation Procurement documentation shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM TG TS
3.1		**Execution Planning**	**Demolition Plan** Provide a current Demolition Plan. Plan shall include, at a minimum, the following: ▪ Scope of demolition effort, including all components or structures to be removed ▪ Demolition methods and how each will be used ▪ Site information (e.g. site conditions, existing equipment, or existing utilities) ▪ Required equipment or machinery ▪ How the remaining existing system will be isolated or reconnected ▪ How the system or structures will be supported or stabilized both during and after demolition ▪ Agreed upon location of laydown areas for removed equipment prior to disposal ▪ How and where the removed materials will be disposed of ▪ Outages and permits required ▪ Issues, concerns, or limitations associated with demolition (e.g. operations, maintenance, or testing impacts) All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Demolition Plan shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Demolition Plan is desired, the Government will provide one upon request.	AF PM
3.2			**Manufacturing Plan** Provide a current Manufacturing Plan. Plan shall include, at a minimum, the following: ▪ Fabrication activities that will be performed ▪ Who will perform the work (e.g. shop or area craft) ▪ Crafts or specific skills required ▪ Site plan for field fabricaton ▪ Equipment, utilities, or facilities required ▪ Prerequisites required for fabrication (e.g. site preparation, training, or cetification) ▪ All equipment that must be procured or rented to support fabrication ▪ Inspection or testing activities required following fabrication ▪ Fabrication and delivery schedule ▪ Issues, concerns, or limitations associated with fabrication (e.g. operations, maintenance, or testing impacts) All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Manufacturing Plan shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Manufacturing Plan is desired, the Government will provide one upon request.	AF PM
3.3			**Installation Plan** Provide a current Installation Plan. Plan shall include, at a minimum, the following: ▪ Installation activities that will be performed ▪ Who will perform the work (e.g. shop or area craft) ▪ Crafts or specific skills required ▪ Equipment, utilities, or facilities required ▪ Site plan for locating large equipment (e.g. cranes or lifts) ▪ Prerequisites required for installation (e.g. site preparation, training, or cetification) ▪ Specific safety or security considerations associated with installation ▪ Identification of other areas and services affected by installation outage ▪ Installation schedule ▪ Issues, concerns, or limitations associated with installation (e.g. area, service, operations, maintenance, or testing impacts) All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Installation Plan shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Installation Plan is desired, the Government will provide one upon request.	AF PM

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3.4			**Concept of Operations** Provide a current Concept of Operations. CONOPS shall describe how the system is intended to be operated, including, at a minimum, the following: ▪ Operational environment (e.g. conditions, assumptions, constraints, or limitations) ▪ How the system is intended to operate, including expected operating conditions (NOT design conditions) ▪ Potential system configurations (e.g. startup, shutdown, maintenance, different users, or different sources) ▪ Detailed sequence required for reconfiguration (including valve names) ▪ Lock out-tag out requirements for major equipment The CONOPS shall account for all phases of operation, including checkout, pre-ops, operations, and post-ops. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. CONOPS shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Concept of Operations is desired, the Government will provide one upon request.	TS
3.5	**Planning Documentation**	**Operations Planning**	**Operations and Maintenance Plan** Provide a current Operations and Maintenance Plan. Plan shall include, at a minimum, the following: ▪ Protective measures addressing safety, security, and environmental concerns, including mitigation of or protection from the operating environment (e.g. noise, heat, or humidity) ▪ Staffing required to operate the system, including number and qualifications ▪ Total cost of materials, utilities, and resources required to operate the system (e.g. cost per hour, cost per year, or cost per test) ▪ Required routine and preventative maintenance activities ▪ Staffing required to perform maintenance activities, including number and qualifications ▪ Total cost of labor, materials, utilities, and resources associated with each maintenance activity ▪ Frequency that each activity is expected to be performed ▪ Special tools that must be purchased or rented to operate or maintain the system ▪ Recommended spare parts All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. Operations and Maintenance Plan shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** O&M Plan is desired, the Government will provide one upon request.	TSS TS
3.6			**Failure Modes and Effects Analysis** Provide a current Failure Modes and Effects Analysis. FMEA shall address, at a minimum, the following: ▪ Failure modes that could result in a non-functional system ▪ Assess the likelihood and impact of each failure mode ▪ Mitigations that could be employed to limit the impact of each failure mode ▪ Assess the likelihood and impact of each mitigated failure mode All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. FMEA shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** FMEA is desired, the Government will provide one upon request.	TS
3.7			**Verification, Validation, and Acceptance Plan** Provide a current Verification, Validation, and Acceptance Plan. Plan shall include all currently known information for the following: ▪ Verification and validation activities that will be performed as part of the project ▪ Type of verification or validation provided by each activity (e.g. analysis, inspection, demonstration, or testing) ▪ Why each verification or validation activity is required (e.g. associated project requirement(s), code, or standard) ▪ Acceptance criteria for each verification and validation activity ▪ Documentation to be provided for each activity to show that the acceptance criteria has been satisfied All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. VV&A Plan shall be in the Final state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** VV&A Plan is desired, the Government will provide one upon request.	TG TS
3.8		**Verification Planning**	**System Test Plan** Provide a current System Test Plan. Plan shall include, but not be limited to, all currently known information for the following: ▪ All inspection and testing activities identified in the VV&A Plan ▪ Activity in the VV&A Plan associated with each inspection or test activity ▪ Specific, step-by-step procedures or instructions that will govern how each activity will be performed (e.g. codes, standards, or work instructions) ▪ Objectives, assumptions, and prerequisites for each test. ▪ Who is responsible, by role, for each step of the test procedure ▪ Equipment and resources required to perform each activity When referencing outside codes and standards, the specific edition and section of the code or standard being reference should be clearly identified. When no existing codes, standards, or work instructions provide suitable procedures or instructions for conducting an identified inspection or testing activity, the System Test Plan shall provide detailed, step-by-step instructions for how the activity is to be performed. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated. System Test Plan shall be in the Final state.D15	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** STP is desired, the Government will provide one upon request.	TG TS

3.9		**Requirements Traceability Document** Provide a current Requirements Traceability Document to cross-reference the information provided in the current requirements documents, Verification, Validation, and Acceptance Plan, and System Test Plan. Requirements traceability shall verify, at a minimum, the following: ▪ All capability-level requirements have been addressed by the system-level requirements ▪ All system-level requirements are justified by the capability-level requirements or otherwise approved (e.g. Requirements Review) ▪ All system-level requirements have associated verification activities in the VV&A Plan ▪ All verification activities specifically identified for each system-level requirement in the requirements documents have corresponding verification activities in the VV&A Plan ▪ All inspection and testing activities identified in the VV&A Plan are addressed in the System Test Plan ▪ All verification activities identified in the VV&A Plan that are not directly associated with a system-level requirement are reasonable and justifiable (e.g. code, standard, safety, or risk mitigation) Any system-level requirement that does not currently have associated verification activities identified in the VV&A Plan shall be clearly identified.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Requirements Traceability Document is desired, the Government will provide one upon request.	TG TS TSS XP*
4.1		**Project Schedule** Provide a current project schedule. Schedule shall include, at a minimum, the following: ▪ Timing and duration of planning activities ▪ Timing and duration of design activities ▪ Timing of each required design review or milestone ▪ Timing and duration of procurement activities ▪ Timing and duration of outages ▪ Timing and duration of fabrication activities ▪ Timing and duration of installation activities ▪ Timing and duration of verification activities ▪ Timing of project completion The schedule shall be exported directly from P6 or Microsoft Project. The schedule shall be a resource loaded schedule broken down to WBS Level 3 or better.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF, 11"X17" Format Location: Review Folder Format: Original File in Native File Format	AF PM
4.2		**Schedule Changes** Provide a summary of all significant changes to the schedule incorporated after the currently approved baseline schedule. A significant change shall be any change that impacts the overall schedule by more than 10% of the total schedule duration. If multiple schedule changes, in aggregate, impact the overall schedule by more than 10% of the total schedule duration, they may be identified as a single change.	Location: Presentation Format: List	AF PM
4.3		**Project Cost Estimate** Provide a current project cost estimate. Estimate shall include, at a minimum, all costs associated with the following: ▪ Engineered equipment (e.g. pumps, compressors, switchgear, or transformers) ▪ Commodity items (e.g. valves, fittings, enclosures, breakers, or fasteners) ▪ Commodity materials (e.g. pipe, tube, wire, cable, or structural materials) ▪ Specialty materials (e.g. specialty forgings, castings, or alloys) ▪ Expendable materials (e.g. welding rod or grinding wheels) ▪ Imposed surcharges or tariffs ▪ Design labor ▪ Fabrication labor ▪ Installation labor ▪ Verification labor ▪ Verification utilities ▪ Project Management The cost estimate shall be a detailed estimate broken down to WBS Level 3 or better.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
4.4		**Cost Estimate Changes** Provide a summary of all significant changes to the cost estimate incorporated after the currently approved baseline estimate. A significant change shall be any change that impacts the overall estimate by more than 10% of the total estimate. If multiple estimate changes, in aggregate, impact the overall estimate by more than 10% of the total estimate, they may be identified as a single change.	Location: Presentation Format: List	AF PM
4.5	**Programmatic Documentation**	**Risk Assessment Matrix** Provide a current Risk Assessment Matrix identifying all known risks associated with execution of the project in accordance with the proposed plans. Risk assessment shall include the following: ▪ All known risks that could significantly affect the technical solution ▪ All known risks that could significantly affect the project cost ▪ All known risks that could significantly affect the project schedule ▪ Any known or potential funding disconnects ▪ Likelihood of each listed risk ▪ Cost, schedule, or performance impact of each listed risk ▪ Potential mitigation activities for each listed risk ▪ When each identified mitigation activity will be implemented ▪ Adjusted likelihood and impact for each listed risk after mitigation All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Summary Table with Link to File Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Risk Assessment Matrix is desired, the Government will provide one upon request.	TG XP*

4.6		**Hazard Tracking Log** Provide a current Hazard Tracking Log. Hazard Tracking Log shall identify the following: ▪ Maintenance and operation hazards that could pose a threat to personnel, equipment, the environment, or operational capability ▪ System, subsystem, or component associated with the hazard ▪ Conditions or events that would cause the hazard ▪ Potential adverse effects as a result of the hazard ▪ Severity of the risks associated with the hazard ▪ Probability of the risks associated with the hazard ▪ Overall risk level associated with the hazard ▪ Potential risk reduction measures and mitigations ▪ Who is responsible for implementing each risk reduction measure or mitigation ▪ Who is responsible for ensuring safeguards are provided for remaining hazards ▪ How it will be verified that each hazard has been effectively controlled ▪ Severity of the risks associated with the hazard following mitigation ▪ Probability of the risks associated with the hazard following mitigation ▪ Overall risk level associated with the hazard following mitigation ▪ Hazard resolution status All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS TSS
4.7		**Exit Criteria** Provide a list of all approved Exit Criteria.	Location: Presentation Format: Table or List	AF PM
4.8		**Entrance Criteria** Provide a list of Entrance Criteria for the next scheduled review. The list shall include the following: ▪ All Government-identified Entrance Criteria for the next scheduled review ▪ Requested deviations from the Entrance Criteria for the next scheduled review If no deviations are requested, this should be clearly stated.	Location: Presentation Format: Table or List	AF PM TG

EXIT CRITERIA		
	Agreement that the provided documentation and supporting information is sufficient to describe the design solution.	*Meeting Minutes Signed AEDC-1683 indicating Approval AEDC-1565 capturing Deficiencies and Action Items.
	Agreement that the planned verification activities are clearly and completely defined.	
	Agreement that the provided cost and schedule is reasonable and acceptable for the design solution.	
	Agreement the technical performance, cost and schedule risks for the effort are acceptable.	
	Agreement that the Entrance Criteria for the next review are acceptable.	

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VERIFICATION READINESS REVIEW (VRR)					
ENTRANCE CRITERIA			WORK PRODUCTS TO BE DELIVERED BY CONTRACTOR	ACCEPTABLE FORMAT(S)	CONCURRENCE
Any required work product not provided for this review, or any work product not provided in the required state, shall have Government approval for the status of the product prior to commencing the review process. Documentation of Government approval shall be provided, clearly identifying the associated work product(s).					
1.1	Review Documentation		**Comments Log** Provide a Comments Log for this review. Comments Log shall include, at a minimum, the following: ▪ All reviewer provided comments ▪ Resolution or disposition for each comment ▪ Status of reviewer concurrance for each comment	Location: Review Folder Format: Excel Spreadsheet If a **TEMPLATE** or **EXAMPLE** Comment Log is desired, the Government will provide one upon request.	AF PM
1.2			**Deficiencies and Action Items.** Provide an updated status for all previous deficiencies and action items. Update shall include the following: ▪ Copy of the signed AEDC-1565 from the previous review ▪ Updated status for all deficiencies and action items listed All unresolved deficiencies or action items shall be clearly identified with documentation indiciating prior Government approval to move forward.	AEDC-1565 Location: Review Folder Format: PDF Status List Location: Presentation Format: Table	TG TS TSS
1.3			**Entrance Criteria** Provide a list of all required Entrance Criteria with mapping to the satisfying documentation. The list shall include the following: ▪ Identification of all approved Entrance Criteria for this review ▪ Acceptable location and format for each item listed ▪ Presentation slide or file intended to satisfy each item listed	Location: Presentation Format: Table	AF PM
1.4			**Deviations from Entrance Criteria** Provide a detailed list of requested deviations from the approved Entrance Critera. The list shall include the following: ▪ All Entrance Criteria that are not satisfied by the information presented at this review ▪ Verification of prior Government approval for the deviation (if previously approved) ▪ Requests for Government approval for the deviation (if not previously appoved)	Location: Presentation Format: List	TG
2.1	O&M Documentation	System Documentation	**User Manuals** Provide a copy of all user manuals or other vendor-supplied operations and maintenance documentation for all new equipment.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF or Native Format	AF PM
2.2			**Training Material** Provide a copy of all training materials used to qualify personnel to operate or maintain the system, including recordings of specialized on-site training.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF or Native Format	AF PM
2.3		Training Verification	**Personnel Qualifications** Provide verification that all required training has been conducted and personnel are qualified to operate the system. Verification shall consist of training certificates, certifications, or other suitable documentation showing that personnel are qualified to operate the system.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
2.4		System Configuration	**Demolition Plan** Provide verification that all activities identified in the Demolition Plan are complete. Verification shall consist of the following: ▪ List of all activities identified in the Demolition Plan ▪ Photographs or documentation showing that each activity has been completed	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF or Image(s)	AF PM
2.5			**Manufacturing Plan** Provide verification that all activities identified in the Manufacturing Plan are complete. Verification shall consist of the following: ▪ List of all activities identified in the Manufacturing Plan ▪ Photographs or documentation showing that each activity has been completed	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF or Image(s)	AF PM
2.6			**Installation Plan** Provide verification that all activities identified in the Installation Plan are complete. Verification shall consist of the following: ▪ List of all activities identified in the Installation Plan ▪ Photographs or documentation showing that each activity has been completed	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF or Image(s)	AF PM
2.7			**System Configuration** Provide verification that the system is in the final configuration. Verification shall consist of photographs, or other documentation, showing that the installed system is in compliance with the approved design drawings and documentation.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF or Image(s)	AF PM
2.8		Drawings	**Field Revisions** Provide a copy of all field revisions to drawings made during execution. Revisions shall identify all deviations from the approved drawings, including the following: ▪ Red-lined revisions that have not been submitted to drafting ▪ As-built revisions that have not received final approval in the CMMS Revisions shall include documentation or signatures to show that any deviation from the approved design was reviewed and accepted prior to execution.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF or Image(s)	AF PM

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3.1	Planning Documentation	Verification, Validation, and Acceptance Plan	**Verification, Validation, and Acceptance Plan** Provide a copy of the approved Verification, Validation, and Acceptance Plan. Plan shall be provided in the approved and unaltered state. Any proposed corrections, changes, or other revisions shall be provided separately for Government approval.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
3.2			**Verification Status** Provide verification that all verification and validation activities identified in the VV&A Plan that are required prior to operational testing have been completed. Verification shall consist of, at a minimum, the following: ▪ List of verification and validation activities required prior to operational testing ▪ Photographs or documentation showing that each activity has been completed	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF or Image(s)	AF PM
3.3		System Test Plan	**System Test Plan** Provide a copy of the approved System Test Plan. Plan shall be provided in the approved and unaltered state. Any proposed corrections, changes, or other revisions shall be provided separately for Government approval.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
3.4			**System Testing Status** Provide verification that all testing activities identified in the System Test Plan that are required prior to operational testing have been completed. Verification shall consist of, at a minimum, the following: ▪ List of testing activities required prior to operational testing ▪ Photographs or documentation showing that each activity has been completed	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF or Image(s)	AF PM
4.1	Programmatic Documentation	Schedule	**Project Schedule** Provide a current project schedule. Schedule shall include, at a minimum, the following: ▪ Timing and duration of planning activities ▪ Timing and duration of design activities ▪ Timing of each required design review or milestone ▪ Timing and duration of procurement activities ▪ Timing and duration of outages ▪ Timing and duration of fabrication activities ▪ Timing and duration of installation activities ▪ Timing and duration of verification activities ▪ Timing of project completion The schedule shall be exported directly from P6 or Microsoft Project. The schedule shall be a resource loaded schedule broken down to WBS Level 3 or better. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF, 11"X17" Format Location: Review Folder Format: Original File in Native File Format	AF PM
4.2			**Schedule Concerns** Provide a summary of any current schedule concerns and how these concerns will be addressed to maintain the required delivery date. Schedule concerns may include delays resulting from, but not limited to, the following: ▪ Area access restrictions ▪ Material delivery ▪ Craft availability ▪ Design revisions ▪ Government resource availability	Location: Presentation Format: List	AF PM
4.3		Cost	**Project Cost Estimate** Provide a current project cost estimate. Estimate shall include, at a minimum, all costs associated with the following: ▪ Engineered equipment (e.g. pumps, compressors, switchgear, or transformers) ▪ Commodity items (e.g. valves, fittings, enclosures, breakers, or fasteners) ▪ Commodity materials (e.g. pipe, tube, wire, cable, or structural materials) ▪ Specialty materials (e.g. specialty forgings, castings, or alloys) ▪ Expendable materials (e.g. welding rod or grinding wheels) ▪ Imposed surcharges or tariffs ▪ Design labor ▪ Fabrication labor ▪ Installation labor ▪ Verification labor ▪ Verification utilities ▪ Project Management The cost estimate shall be a detailed estimate broken down to WBS Level 3 or better. All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
4.4			**Cost Concerns** Provide a summary of any current cost concerns and how these concerns will be addressed to keep costs within the available funding. Cost considerations may include cost increases resulting from, but not limited to, the following: ▪ Additional project scope ▪ Additional design revisions ▪ Additional documentation or testing ▪ Additional Government resource requirements	Location: Presentation Format: List	AF PM

4.5			**Risk Mitigations** Provide verification that identified risk mitigations for operations or maintenance have been implemented. Verification shall consist of the following: ▪ List of all mitigations identified in the Risk Assessment Matrix ▪ Photographs or documentation showing that each mitigation has been implemented	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF or Image(s)	AF PM
4.6		**Hazards and Risks**	**Hazard Tracking Log** Provide a current Hazard Tracking Log. Hazard Tracking Log shall identify the following: ▪ Maintenance and operation hazards that could pose a threat to personnel, equipment, the environment, or operational capability ▪ System, subsystem, or component associated with the hazard ▪ Conditions or events that would cause the hazard ▪ Potential adverse effects as a result of the hazard ▪ Severity of the risks associated with the hazard ▪ Probability of the risks associated with the hazard ▪ Overall risk level associated with the hazard ▪ Potential risk reduction measures and mitigations ▪ Who is responsible for implementing each risk reduction measure or mitigation ▪ Who is responsible for ensuring safeguards are provided for remaining hazards ▪ How it will be verified that each hazard has been effectively controlled ▪ Severity of the risks associated with the hazard following mitigation ▪ Probability of the risks associated with the hazard following mitigation ▪ Overall risk level associated with the hazard following mitigation ▪ Hazard resolution status All changes from the previous review shall be clearly identified. If there are no changes from the previous review, this shall be clearly stated.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	TS TSS
EXIT CRITERIA					
	Agreement that personnel are adequately trained and are available to conduct system verifications.			*Meeting Minutes	
	Agreement that adequate documentation and safety countermeasures exists to conduct system verifications.			Signed AEDC-1683 indicating Approval	
	Agreement that risks of conducting system verifications are mitigated and acceptable.			AEDC-1565 capturing Deficiencies and Action Items.	

PROCUREMENT READINESS REVIEW (PRR)					
	ENTRANCE CRITERIA		WORK PRODUCTS TO BE DELIVERED BY CONTRACTOR	ACCEPTABLE FORMAT(S)	CONCURRENCE
Any required work product not provided for this review, or any work product not provided in the required state, shall have Government approval for the status of the product prior to commencing the review process. Documentation of Government approval shall be provided, clearly identifying the associated work product(s).					
1.1	Review Documentation		**Comments Log** Provide a Comments Log for this review. Comments Log shall include, at a minimum, the following: • All reviewer provided comments • Resolution or disposition for each comment • Status of reviewer concurrance for each comment	Location: Review Folder Format: Excel Spreadsheet If a **TEMPLATE** or **EXAMPLE** Comment Log is desired, the Government will provide one upon request.	AF PM
1.2			**Project Summary** Provide a brief project summary. Summary shall clearly identify, at a minimum, the following: • Purpose of the project • Current scope of the project • Approvals requested as part of this review • Waivers or deviations requested as part of this review • Scope changes or clarifications requested as part of this review • Requirements revisions or clarifications requested as part of this review	Location: Presentation Format: Narrative	AF PM
1.3			**Entrance Criteria** Provide a list of all required Entrance Criteria with mapping to the satisfying documentation. The list shall include the following: • Identification of all approved Entrance Criteria for this review • Acceptable location and format for each item listed • Presentation slide or file intended to satisfy each item listed	Location: Presentation Format: Table	AF PM
1.4			**Deviations from Entrance Criteria** Provide a detailed list of requested deviations from the approved Entrance Critera. The list shall include the following: • All Entrance Criteria that are not satisfied by the information presented at this review • Verification of prior Government approval for the deviation (if previously approved) • Requests for Government approval for the deviation (if not previously appoved)	Location: Presentation Format: List	TG
2.1	Procurement Documentation	Procurement Planning	**Procurement Summary** Provide a detailed description of each component or piece of equipment for which approval for early procurement is requested as part of this review. For each component, the description shall include, at a minimum, the following: • Component description, including type or function • Summary of salient features and requirements • Explanation of how the component fits into the overall design • Anticipated Cost • Anticipated Delivery Time • Justification for early procurement, including a need date • Associated procurement documents (e.g. SOW, Specification, or Advanced Release BOM) • Associated analysis and calculation reports	Location: Presentation Format: List or Table	AF PM
2.2			**Procurement Documentation** Provide procurement documentation for each component or piece of equipment for which approval for early procurementis requested as part of this review. Procurement documentation shall be sufficient to procure a suitable component and may include: • Advanced Release Bill of Materials • Data Sheets • Equipment Specification • Statement of Work • Statement of Objectives • Waivers or approvals required to execute the listed procurement documentation All procurement documentation shall be in the Approved state and all required waivers or approvals shall be signed and approved.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM TG TS
2.3		Drawings	**Operational Drawings** Provide supporting schematics, line diagrams, or wiring diagrams for each component or piece of equipment for which approval for early procurementis requested as part of this review. Drawings shall justify that the component specified is capable of satisfying the system requirements and shall be sufficient to establish, at a minimum, the following: • Specified design conditions are consistent with the listed design conditions • Where the component will be located in the system • How the component will function in the system • Provided analysis is consistent with the intended installation and function of the component All drawings shall be in the Approved state. For all drawings not in the Approved state, a specific line item shall be included in the Risk Assessment Matrix detailing the level of risk associated with executing the procurement without complete documentation.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM TG TS
2.4			**Fabrication and Installation Drawings** Provide supporting fabrication and installation drawings for each component or piece of equipment for which approval for early procurementis requested as part of this review. Drawings shall justify that the component specified is capable of satisfying the system requirements and shall be sufficient to establish, at a minimum, the following: • Specified connections are consistent with the intended system construction • Specified materials are consistent with the intended system construction • There is sufficient space to properly install the component • There is sufficient space to properly operate and maintain the component • There is sufficient support to accomodate the component All drawings shall be in the Approved state. For all drawings not in the Approved state, a specific line item shall be included in the Risk Assessment Matrix detailing the level of risk associated with executing the procurement without complete documentation.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM TG TS

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2.5		Analysis	**Analysis** Provide supporting analysis and calculations for each component or piece of equipment for which approval for early procurementis requested as part of this review. Analysis shall justify that the component specified is capable of satisfying the system requirements and shall be sufficient to establish, at a minimum, the following: • Specified design conditions are consistent with the evaluated design conditions • Specified component ratings are consistent with the design conditions of the system (e.g. pressure, temperature, load, voltage, or amperage) • Specified component sizing has considered the appropriate operating conditions (**NOT** design conditions) and is capable of providing the required capacity • Specified component performance is capable of satisfying system requirements (e.g. valve actuator timing or control system response time) • Component is capable of accomodating all loads imposed by the system • Component materials are appropriate for the specified design conditions All analysis shall be in the Approved state. For all analysis not in the Approved state, a specific line item shall be included in the Risk Assessment Matrix detailing	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM TG TS
3.1	Funding Documentation		**Market Research** Provide detailed market research for each requested procurement. Research shall include, at a minimum, the following: • Potential vendors or manufacturers • Location and contact information for each vendor or manufacturer • Status of each vendor or manufacturer (e.g. small business, minority owned, or veteran owned) • CAGE / DUNS ID for each vendor or manufacturer • Proposed product with manufacturer and model number from each vendor • Estimated price from each vendor • Estimated delivery time from each vendor If a contacted vendor responds that they are not interested in bidding on the procurement based on the information provided, this information should be provided as "NO BID" for the product, price, and delivery.	Location: Presentation Format: Table	AF PM
3.2			**Simplified Acquisition** Provide Single Source Justification documentation for each qualifying component that will not be competitively bid. For each qualifying procurement, documentation shall include, but not be limited to, the following: • Manufacturer and/or model number for requested component • Justification for simplified acquisition • Approvals required for simplified acquisition	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
3.3			**Cost Estimate** Provide a detailed cost estimate for each procurement. Cost estimate shall be provided using the Independent Government Cost Estimate (IGCE) format.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM
4.1			**Acquisition Strategy** Provide a recommended Acquisition Strategy for each procurement. The strategy shall identify, at a minimum, the following: • What procurement method will be used for each procurement (e.g. TOS or PZ) • All procurement waivers required to execute the identified acquisition strategy Commodity materials (e.g. pipe or fittings) may be addressed as a singular item as long as all procurement is expected to have the same procurement method.	Location: Presentation Format: Table	AF PM
4.2			**Calibration Information** Provide calibration information for each applicable procurement. Calibration information shall include, at a minimu, the following: • Calibration certifications to be received from the vendor or manufacturer • Whether the component will require calibration on base • Timeline for on-base calibration, if required	Location: Presentation Format: Table	TSDI
4.3	Programmatic Documentation		**Risk Assessment Matrix** Provide a Risk Assessment Matrix specific to the requested procurements. Risk Assessment shall identify, at a minimum, the following: • All known risks that could significantly affect the technical solution • All known risks that could significantly affect the project cost • All known risks that could significantly affect the project schedule • Any known or potential funding disconnects • Likelihood of each listed risk • Cost or schedule impact of each listed risk • Potential mitigation activities for each listed risk • When each identified mitigation activity will be implemented • Adjusted likelihood and impact for each listed risk after mitigation Risks identified shall include all risks associated with both executing and not executing the procurement as requested. The project Risk Assessment Matrix shall be updated following this review to reflect the decision made.	Location: Presentation Format: Summary Table with Link to File Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Risk Assessment Matrix is desired, the Government will provide one upon request.	AF PM

EXIT CRITERIA		
	Agreement that the information provided adequately identifies the requirements for the components to be procured.	*Meeting Minutes Signed AEDC-1683 indicating Approval AEDC-1565 capturing Deficiencies and Action Items.
	Agreement that the procurement documenation provided adequately defines the component to be procured.	
	Agreement that the estimated cost of the procurements is acceptable.	
	Agreement that the estimated delivery time, including calibration time, of the procurements is acceptable.	
	Agreement that the technical performance, cost, and schedule risks for the procurements are acceptable.	

EXECUTION READINESS REVIEW (ERR)					
ENTRANCE CRITERIA			WORK PRODUCTS TO BE DELIVERED BY CONTRACTOR	ACCEPTABLE FORMAT(S)	CONCURRENCE
Any required work product not provided for this review, or any work product not provided in the required state, shall have Government approval for the status of the product prior to commencing the review process. Documentation of Government approval shall be provided, clearly identifying the associated work product(s).					
1.1	Review Documentation		**Comments Log** Provide a Comments Log for this review. Comments Log shall include, at a minimum, the following: • All reviewer provided comments • Resolution or disposition for each comment • Status of reviewer concurrance for each comment	Location: Review Folder Format: Excel Spreadsheet If a **TEMPLATE** or **EXAMPLE** Comment Log is desired, the Government will provide one upon request.	AF PM
1.2			**Project Summary** Provide a brief project summary. Summary shall clearly identify, at a minimum, the following: • Purpose of the project • Current scope of the project • Approvals requested as part of this review • Waivers or deviations requested as part of this review • Scope changes or clarifications requested as part of this review • Requirements revisions or clarifications requested as part of this review	Location: Presentation Format: Narrative	AF PM
1.3			**Entrance Criteria** Provide a list of all required Entrance Criteria with mapping to the satisfying documentation. The list shall include the following: • Identification of all approved Entrance Criteria for this review • Acceptable location and format for each item listed • Presentation slide or file intended to satisfy each item listed	Location: Presentation Format: Table	AF PM
1.4			**Deviations from Entrance Criteria** Provide a detailed list of requested deviations from the approved Entrance Critera. The list shall include the following: • All Entrance Criteria that are not satisfied by the information presented at this review • Verification of prior Government approval for the deviation (if previously approved) • Requests for Government approval for the deviation (if not previously appoved)	Location: Presentation Format: List	TG
2.1		Activity Planning	**Execution Summary** Provide a detailed description of all demolition, fabrication, or installation activities for which approval for early execution is requested as part of this review. For each activity, the description shall include, at a minimum, the following: • Scope of work to be performed • Craft / Labor required to perform the work • Craft / Labor availability to perform the work • Estimated cost • Proposed schedule • Required verification activities and acceptance criteria • Justification for early execution, including need date • Associated procurements • Associated demolition / fabrication / installation drawings • Associated analysis and calculation reports	Location: Presentation Format: List or Table	AF PM
2.2			**Required Materials** Provide a detailed list of materials required for each requested activity. A complete list of materials shall be provided for each individual activity. Each list shall include, at a minimum, the following: • Material or item description • Whether each material or item has been procured • Whether each material or item has been delivered and is on-base • Anticipated delivery time for any outstanding materials or items	Location: Presentation Format: List or Table	AF PM
2.3			**Demolition Drawings** Provide all design drawings required to perform each requested demolition activity. Drawings shall be sufficient to establish, at a minimum, the following: • What components will be removed • What components will remain in service • How each system that will remain in service will be blinded, capped, or isolated Drawings shall include, at a minimum, the following: • Code of Construction • NDE requirements • Complete identification of all fabrication materials • Complete identification of all purchased components • Clear identification of demolition scope • Complete identification of all welds All drawings shall be in the Approved state. For all drawings not in the Approved state, including Advanved Release Drawing, a specific line item shall be included in the Risk Assessment Matrix detailing the level of risk associated with executing the activity without complete documentation.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM TG TS

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2.4	**Activity Documentation**	**Drawings**	**Fabrication Drawings** Provide all design drawings required to perform each requested fabrication activity. Drawings shall justify that the component specified is capable of satisfying the system requirements and shall be sufficient to establish, at a minimum, the following: • Specified connections are consistent with the intended system construction • Specified materials are consistent with the intended system construction • There is sufficient space to properly install the component • There is sufficient support to accomodate the component Drawings shall include, at a minimum, the following: • Code of Construction • Design conditions • NDE requirements • Complete identification of all fabrication materials • Complete identification of all purchased components • Detailed fabrication dimensions and details, including fabrication tolerances • Complete identification of all welds If additional fabrication details are identified on the same drawings, what components will or will not be fabricated shall be clearly identified. The information requirements stated above only apply to the portions of the drawings intended to be fabricated as a result of this review. All drawings shall be in the Approved state. For all drawings not in the Approved state, including Advanved Release Drawing, a specific line item shall be included in the Risk Assessment Matrix detailing the level of risk associated with executing the activity without complete documentation	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM TG TS
2.5			**Installation Drawings** Provide all design drawings required to perform each requested installation activity. Drawings shall justify that the component specified is capable of satisfying the system requirements and shall be sufficient to establish, at a minimum, the following: • Specified connections are consistent with the intended system construction • Specified materials are consistent with the intended system construction • There is sufficient space to properly install the component • There is sufficient support to accomodate the component Drawings shall include, at a minimum, the following: • Code of Construction • Design conditions • NDE requirements • Complete identification of all components • Detailed installation dimensions and details, including installation tolerances • Complete identification of all welds If additional installation details are identified on the same drawings, what components will or will not be installed shall be clearly identified. The information requirements stated above only apply to the portions of the drawings intended to be installed as a result of this review. All drawings shall be in the Approved state. For all drawings not in the Approved state, including Advanved Release Drawings, a specific line item shall be included in the Risk Assessment Matrix detailing the level of risk associated with executing the activity without complete documentation	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM TG TS
2.6		**Analysis**	**Analysis** Provide supporting analysis and calculations for each requested activity. Analysis shall justify that the component specified is capable of satisfying the system requirements and shall be sufficient to establish, at a minimum, the following: • Specified design conditions are consistent with the evaluated design conditions • Specified component ratings are consistent with the design conditions of the system (e.g. pressure, temperature, load, voltage, or amperage) • Specified component sizing has considered the appropriate operating conditions (**NOT** design conditions) and is capable of providing the required capacity • Specified component performance is capable of satisfying system requirements (e.g. valve actuator timing or control system response time) • Component is capable of accomodating all loads imposed by the system • Component materials are appropriate for the specified design conditions All analysis shall be in the Approved state. For all analysis not in the Approved state, a specific line item shall be included in the Risk Assessment Matrix detailing the level of risk associated with executing the procurement without complete	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM TG TS
3.1			**Demolition Plan** Provide a Demolition Plan for all requested demolition activities. Plan shall include, at a minimum, the following: • Scope of demolition effort, including all components or structures to be removed • Demolition methods and how each will be used • Site information (e.g. site conditions, existing equipment, or existing utilities) • Required equipment or machinery • How the remaining existing system will be isolated or reconnected • How the system or structures will be supported or stabilized both during and after demolition • Agreed upon location of laydown areas for removed equipment prior to disposal • How and where the removed materials will be disposed of • Outages and permits required • Issues, concerns, or limitations associated with demolition (e.g. operations, maintenance, or testing impacts) The Demolition Plan for early execution shall be provided separately from the overall project Demolition Plan. Demolition Plan shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Demolition Plan is desired, the Government will provide one upon request.	AF PM

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3.2	Planning Documenation	Execution Planning	**Manufacturing Plan** Provide a Manufacturing Plan for all requested fabrication activities. Plan shall include, at a minimum, the following: • Fabrication activities that will be performed • Who will perform the work (e.g. shop or area craft) • Crafts or specific skills required • Site plan for field fabricaton • Equipment, utilities, or facilities required • Prerequisites required for fabrication (e.g. site preparation, training, or cetification) • All equipment that must be procured or rented to support fabrication • Inspection or testing activities required following fabrication • Fabrication and delivery schedule • Issues, concerns, or limitations associated with fabrication (e.g. operations, maintenance, or testing impacts) The Manufacturing Plan for early execution shall be provided separately from the overall project Manufacturing Plan. Manufacturing Plan shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Manufacturing Plan is desired, the Government will provide one upon request.	AF PM
3.3			**Installation Plan** Provide an Installation Plan for all requested installation activities. Plan shall include, at a minimum, the following: • Installation activities that will be performed • Who will perform the work (e.g. shop or area craft) • Crafts or specific skills required • Equipment, utilities, or facilities required • Site plan for locating large equipment (e.g. cranes or lifts) • Prerequisites required for installation (e.g. site preparation, training, or cetification) • Specific safety or security considerations associated with installation • Identification of other areas and services affected by installation outage • Installation schedule • Issues, concerns, or limitations associated with installation (e.g. area, service, operations, maintenance, or testing impacts) The Installation Plan for early execution shall be provided separately from the overall project Installation Plan. Installation Plan shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Installation Plan is desired, the Government will provide one upon request.	AF PM
3.4		Verification Planning	**Verification, Validation, and Acceptance Plan** Provide a Verification, Validation, and Acceptance Plan for all requested demolition, fabrication, and installation activities. Plan shall include all currently known information for the following: • Verification and validation activities that will be performed as part early execution • Type of verification or validation provided by each activity (e.g. analysis, inspection, demonstration, or testing) • Why each verification or validation activity is required (e.g. associated project requirement(s), code, or standard) • Acceptance criteria for each verification and validation activity • Documentation to be provided for each activity to show that the acceptance criteria has been satisfied The VV&A Plan for early execution shall be provided separately from the overall project VV&A Plan. VV&A Plan shall be in the Approved state.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** VV&A Plan is desired, the Government will provide one upon request.	TG TS
4.1			**Acquisition Strategy** Provide a recommended Acquisition Strategy for each fabrication or installation activity. The strategy shall identify, at a minimum, the following: • Who is expected to perform each activity (e.g. TOS, FARM, or outside contractor) • Justification for each selected acquisition approach • All waivers, permits, or documentation required to execute the identified acquisition strategy Commodity materials (e.g. pipe or fittings) may be addressed as a singular item as long as all procurement is expected to have the same procurement method.	Location: Presentation Format: Table	AF PM
4.2			**Activity Cost Estimate** Provide a detailed cost estimate for each requested demolition, fabrication, or installation activity. Estimate shall include, at a minimum, all costs associated with the following: • Engineered equipment (e.g. pumps, compressors, switchgear, or transformers) • Commodity items (e.g. valves, fittings, enclosures, breakers, or fasteners) • Commodity materials (e.g. pipe, tube, wire, cable, or structural materials) • Specialty materials (e.g. specialty forgings, castings, or alloys) • Expendable materials (e.g. welding rod or grinding wheels) • Imposed surcharges or tariffs • Design labor • Fabrication labor • Installation labor • Verification labor • Verification utilities • Project Management The cost estimate shall be a detailed estimate broken down to WBS Level 3 or better.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF	AF PM

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4.3	**Programmatic Documentation**	**Activity Schedule** Provide a detailed schedule for each requested demolition, fabrication, or installation activity. Schedule shall include, at a minimum, the following: • Timing and duration of outages • Timing and duration of fabrication activities • Timing and duration of installation activities • Timing and duration of verification activities • Return to service date The schedule shall be exported directly from P6 or Microsoft Project. The schedule shall be a resource loaded schedule broken down to WBS Level 3 or better.	Location: Presentation Format: Link(s) to File(s) Location: Review Folder Format: PDF, 11"X17" Format Location: Review Folder Format: Original File in Native File Format	AF PM
4.4		**Outage Planning** Provide a detailed list of outages required for each requested activity. The list shall include, at a minimum, the following: • Timing and duration of each outage requested • What resources will be affected by each outage (e.g. systems, subsystems, test cells, test areas, facilities, or plants) • Whether each outage has been coordinated with the test schedule / MIG • What outage preparations are required (e.g. LOTO, reconfiguration, or draining)	Location: Presentation Format: Table	AF PM
4.5		**Risk Assessment Matrix** Provide a Risk Assessment Matrix specific to the requested activities. Risk Assessment shall identify, at a minimum, the following: • All known risks that could significantly affect the technical solution • All known risks that could significantly affect the project cost • All known risks that could significantly affect the project schedule • Any known or potential funding disconnects • Likelihood of each listed risk • Cost or schedule impact of each listed risk • Potential mitigation activities for each listed risk • When each identified mitigation activity will be implemented • Adjusted likelihood and impact for each listed risk after mitigation Risks identified shall include all risks associated with both executing and not executing the activities as requested. The project Risk Assessment Matrix shall be updated following this review to reflect the decision made.	Location: Presentation Format: Summary Table with Link to File Location: Review Folder Format: PDF If a **TEMPLATE** or **EXAMPLE** Risk Assessment Matrix is desired, the Government will provide one upon request.	AF PM

EXIT CRITERIA		
	Agreement that the information provided adequately identifies the work to be performed.	*Meeting Minutes Signed AEDC-1683 indicating Approval AEDC-1565 capturing Deficiencies and Action Items.
	Agreement that the information provided adequately identifies the equipment and material to be procured.	
	Agreement that the estimated cost of the work is acceptable.	
	Agreement that the estimated execution time, including verifiction, of the work is acceptable.	
	Agreement that the technical performance, cost, and schedule risks for the work are acceptable.	

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