SECTION GR-B

ENGINEERING DATA AND SUBMITTAL SCHEDULE

1. ENGINEERING DATA: Compliance with the Schedule and the Seller's Deliverable Schedule (SDS) for engineering data submittal is essential to the scheduled progress and timely completion of the Project and is of the essence of this Contract.

1.1 Numbering System: The Buyer will designate the format type of all tags for equipment, instrument, line, valve, etc. that will be utilized in Seller's documentation. The Buyer has provided an identification numbering system to provide consistent numbering throughout the unit and consistent with the Buyer's numbering system, attached as Project Tagging Requirements (PTR). All electrical devices, control and instrumentation equipment, valves, and other items of similar nature shall be permanently identified with the identification number in agreement with the PTR. Except as specified otherwise, the identification shall be engraved on stainless steel nameplates and permanently affixed to the device using an epoxy adhesive, metal screws, pins, or wire. The Seller shall utilize the rules outlined in the PTR document for providing the first pass at tagging the various components on the Seller's initial review drawings, documents, and instruction manuals. Buyer will review the Seller's tags to ensure compliance with the PTR and no duplication with Buyer-tagged scope.

1.1.1 Tagging Details: For this Specification, the Seller shall use the following tagging details, to be verified by the Buyer during deliverable review and approval process.

a. Unit Identifier: 10, 20
b. Unique Line Number(s): 800-899
c. Unique Instrument/Valve/Specialty/Support Number(s): 800-899
d. System Code(s): See PTR
e. System Subdivision: See PTR

1.2 Kick-Off and Contract Review: The Seller shall participate in a kick-off meeting at the Buyer's office or via Microsoft Teams or WebEx. As part of this kick-off meeting, a specification page turn with the Buyer's Responsible Engineer and the Seller's operations personnel shall be conducted. The walk through of each contract section is intended to confirm that there are no misunderstandings of the contractual technical requirements and both parties are in agreement on the interpretation of the language.

2. SUBMITTALS AND CORRESPONDENCE: All correspondence, technical and commercial, including all documents, data, and drawings shall be provided in the English language. The following two articles describe in detail the minimum expectations for technical submittals; the third article describes the expectations for commercial correspondence, which follows a separate procedure.

2.1 General Submittal Format: All Engineering Drawings and Engineering Data shall be submitted to Buyer in electronic format (excluding vendor manuals). Electronic documents shall be submitted as noted below:

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a. Documents shall be submitted in minimum 200 dpi PDF format (searchable) with the exception of project schedules. Project schedules shall be submitted in Primavera 7.0 version or higher as well as 200 dpi PDF format. A higher resolution than 200 dpi may be requested depending on the amount of detail in the Seller's deliverable(s).
    1. Electronic Documents uploaded shall not exceed 2 GB for a single upload. Zip files are an unacceptable submittal format with the exception of model files.
b. PDF must be Acrobat 5.0 (PDF 1.4) compatible
c. Lists shall be provided in PDF format for review and approval. Lists with a corresponding template attached to this Section shall also be submitted in Excel format (.xls or .xlsx).
d. Model files may be submitted as zip files but should not contain any other submittals.
e. Electronic PDF documents shall not contain ANY of the document information listed below:
    1. PDF Security (password protection)
    2. Digital Signatures
    3. Metadata
    4. File Attachments
    5. Annotations and Comments
    6. Form field logic or actions
    7. Hidden Text
    8. Hidden Layers
    9. Embedded Search Index
    10. Deleted Hidden Page and Image Content
f. Project Records Information Management System (RIMS) shall be utilized for both document submittal and document return. Separate instructions will be provided for site access. Seller shall provide a list of personnel requiring access, including name, title, address, phone number and email address.
g. Information Management Lead (IML) shall provide log-in information and instructions to Seller's Document Control and Project Management team for posting documents to RIMS. If Seller will be required to provide any North American Electric Reliability Corporation-Critical Infrastructure Protection (NERC-CIP) sensitive material with the contract, submit certified memo stating who on the project from the Seller have background checks along with their phone number and email address to IML to provide secure access for those select personnel.
h. Seller shall enter the following Metadata for each document uploaded (instructions provided later):
    1. Document Number (match Vendor Drawing Number)
    2. Revision
    3. Status
    4. Title

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5. Type (based on SDS Line Item)
6. Vendor Drawing Number (VDN)
7. Vendor Drawing Revision (VDN Rev)
8. SDS Line Item (Deliverable Line Item)
9. Vendor Number
10. NERC-CIP Document

2.2 Transmittals: Document Transmittals shall originate out of the RIMS once submittal is uploaded and shall contain, at a minimum, the following:

a. Seller's Name
b. Contract Number (and if applicable, Item Purchased Number)
c. Title
d. Document Number
e. Vendor Document Number (VDN)
f. VDN Revision
g. Status (Vendor Document Review)
h. Quantity Sent (hard copy submittals only)
i. SDS Item Number to which the submittal applies
j. Date of submission
k. Transmittal recipients:

RIMS Mailbox (Vendor Doc Control)	Smarr.VDC@kiewit.com
Lead Engineer	John.Solar@kiewit.com
Responsible Engineer	Aaron.Kilstofte@kiewit.com

2.3 Submittals will be considered received when transmitted to Kiewit after upload to the RIMS. Submittals that arrive later than 5 PM Central Time will be documented as received at the beginning of the next calendar day.

2.4 Effort should be made to provide all submittals in electronic PDF format. Submittals such as large binders, paint samples, product samples, or other submittals that cannot be submitted electronically shall be submitted in hard copy to the following address:

HARD COPY

Kiewit
Attention: Rachel Akers
9701 Renner Blvd.
Lenexa, KS, 66219

2.5 One (1) copy of the transmittal the list of the data included in the transmittal, and two (2) prints of the Engineering Drawings and Engineering Data shall be sent by express mail to the Buyer's address above.

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2.6 Commercial Correspondence: All commercial documentation, including but not limited to, any correspondence regarding adjustments to cost or schedule shall be addressed to the Buyer as follows:

HARD COPY

BUYER
Attn: Kayla Sisk
9701 Renner Blvd.
Lenexa, KS, 66219

Phone: 210-317-6207

ELECTRONIC COPY

Kayla Sisk	Kayla.Sisk@kiewit.com
Steve Lorenz	Steve.Lorenz@kiewit.com
Kyle Moore	Kyle.Moore3@kiewit.com
RIMS Mailbox (Expediting)	Smarr.VDC@kiewit.com
Lead Engineer	John.Solar@kiewit.com
Responsible Engineer	Aaron.Kilstofte@kiewit.com

2.7 All commercial correspondence shall be identified with the Project name, Specification number, Buyer's Project number, and Seller's order number.

3. REVIEW OF ENGINEERING DATA: The Buyer's review of engineering data will cover only general conformity of the data to the Specifications and Documents, external connections, interfaces with equipment and materials furnished under separate specifications, and dimensions which affect plant arrangements. The Buyer's review including any indication or drawing approval, does not indicate a thorough review of all dimensions, quantities, and details of the Equipment, material, device, or item indicated or the accuracy of the information submitted; nor shall review by the Buyer be construed as relieving the Seller from any responsibility for errors or deviations from the requirements of the Contract. Additionally, any omission of requested deliverables or information in the SDS does not relieve the Seller of the responsibility to provide all required information for the Buyer to complete the overall project design.

3.1 All engineering data submitted, after final processing and acceptance by the Buyer shall become a part of the Contract. Work shall be performed in accordance with the accepted engineering data.

4. TEST AND INSPECTION DATA: Test and inspection reports shall be provided by the Seller for all tests and inspections conducted on the specified equipment or material.

4.1 CERTIFICATE OF COMPLIANCE FORM CC-2: The supplier shall fill out and submit CC-2 forms as certified shop drawings for compliance with ASME B31.1 for any NBEP (Non Boiler External Piping and Joint), piping subassembly (e.g. pipe spools),assembly (e.g. equipment skids), or non-standard piping component that is provided by the supplier as part of a covered piping system (CPS) as defined in ASME B31.1. The template Form CC-2 Certificate of

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Compliance for Fabricated Components, Subassemblies, and Assemblies is attached to this technical specification along with instructions for the supplier to fill it out. Multiple items may be listed on a single CC-2 form, but all items shall be of the same piping system. The Seller may choose to prepare more than one CC-2 form for a single piping system to better organize submittals or to meet schedule demands. Supplier shall maintain a Quality Management Program in accordance with ASME B31.1 Appendices Q & R, and submit a written description of the program with documentation name, number, and revision date.

5. DRAWINGS: All drawings necessary for design, installation and operation shall be submitted. Drawings shall be fully completed, checked, and certified by the Seller to verify that the information on the submittal is complete with the requirements of these Specifications. Drawings shall have title block entries clearly indicating the drawing is certified.

5.1 Each drawing submitted shall have a title block clearly marked with the name of the Project, the unit designation, the Specification title, the Specification number, the equipment or structure nomenclature, the equipment tag number, and the Seller's name, address, date of approval, drawing revision number, and responsible person. For drawings in which the Specification requires a Professional Engineer (PE) stamp, the drawing submitted shall be stamped and signed by the responsible PE licensed to practice in the state of the project location. If standard drawings or catalog pages are submitted, the applicable Equipment and devices furnished shall be clearly marked. Any drawing with detail or section views shall clearly be identified with the orientation of the view directly on the drawing (i.e. Elevation View, Top View, Bottom View, etc.).

5.2 All shop drawings and other submittals shall be corrected to as-built conditions prior to shipment.

5.3 The Seller shall notify the Buyer, in writing, of any information in the shop drawing that deviates from the requirements of the Contract.

5.4 Buyer approval of any deliverables does not release the Seller of responsibility for the accuracy, correctness, and quality of the Seller’s work.

5.5 Submittal of new or revised drawings resulting from a contract change order shall be completed within two (2) weeks of the executed change order unless noted otherwise in the change order. Drawing submittals resulting from change orders shall be as defined below. Liquidated damages shall apply as defined for similar drawings in the SDS.

5.6 The due dates for submittals as noted on the SDS correspond to the date the drawings are due in the office of the Buyer.

5.7 A copy of all native electronic files used to develop the project document or data deliverables shall be provided by Seller.

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5.8 All native application CAD files (e.g. AutoCAD, MicroStation, etc.) or any other electronic drawing files shall be delivered upon project completion. This includes the electronic files used for 3D modeling.

5.9 If the Manufacturer's Standard Operation and Maintenance Manual(s) have been issued prior to the change order, sufficient drawings shall be transmitted to ensure that all Manuals are updated.

5.10 Drawing Submittals:

5.10.1 If hard copy submittal is required, two (2) prints of each drawing shall be submitted.

5.10.1.1 Hard copy prints shall be black lines and text on white background.

5.10.1.2 Print size shall not exceed 34" by 44" (864 mm x 1118 mm), unless due to the size of the Equipment larger drawings are necessary.

5.10.1.3 Piping and Instrumentation Diagrams shall be provided on 11" x 17" (279.4 mm x 431.8 mm) paper.

5.10.1.4 All hard copy drawings submitted shall be folded to 8-1/2" by 11" (215.9 mm x 279.4 mm).

5.10.2 Electronic Submittal (PDF) Settings: Seller shall confirm that all drawings being submitted electronically are clear and legible prior to submitted to Buyer. Following are acceptable PDF settings:

5.10.2.1 PDF Files: Following are acceptable PDF formats:

PDF	Adobe Portable Document Format
PDF – Raw	Raster only PDF subset – bi-level, 8 bit, 24 bit RAW
PDF – CCITT G4	Raster only PDF subset – bi-level CCITT G4
PDF – CCITT G3	Raster only PDF subset – bi-level CCITT G3
PDF – JPEG	Raster only PDF subset – 8 bit, 24 bit color
PDF – Flate	Raster only PDF subset – bi-level, 8 bit, 24 bit
PDF – LZW	Raster only PDF subset – bi-level, 8 bit, 24 bit

5.10.2.2 PDF Security: Note that submittals must NOT be password-protected files, unless they are NERC-CIP related. Following are the acceptable PDF security settings (found under File → Document Properties → Security within Adobe Acrobat):

Security Method	No Security
Can be Opened by	All versions of Acrobat
Printing	Allowed
Document Assembly	Not Allowed

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Content Copying or Extraction	Allowed
Content Extraction for Accessibility	Allowed
Commenting	Not Allowed
Filling of form fields	Allowed
Signing	Not Allowed
Creation of Template Pages	Not Allowed
Submitting Forms	Not Allowed

5.11 The following articles for statuses and resubmittals apply to all Vendor deliverables.

5.11.1 Drawing Processing: Effort will be made to review and return all submittals to the Seller within twenty-one (21) calendar days as stipulated herein, except that drawings with "SUPERSEDED or SUPERSEDED BEFORE FULLY REVIEWED" (SSR) status will not be returned. The status "SSR" is assigned when the Seller submits the document before the already submitted document is not returned/still under review by the Buyer. Drawings returned to the Seller will be in Adobe Acrobat (pdf) format with the Buyer's comments and Action Stamp.

5.11.1.1 When drawings and data are returned marked "APPROVED AS NOTED" (AAN), the changes shall be made as noted thereon, and the drawing shall be resubmitted for final approval.

5.11.1.2 If a drawing(s) is returned to the Seller with a status of "RETURNED FOR RECORD" (RFR), comments made to the drawing(s) (such as addition of tag numbers) shall be noted by the Seller but the Seller is not required to pick up the comment immediately and resubmit unless requested by the Buyer. However, if the Seller does re-submit the drawing(s) for other reasons, the comment shall be picked up within the new revision.

5.11.1.3 Drawings and data that do not meet the minimum requirements of the Contract will be returned marked "RETURNED FOR CORRECTION" (RFC), and will be regarded as not submitted. When the drawings and data are returned marked RFC, the corrections shall be made as noted thereon and as instructed by the Buyer, and the drawing shall be resubmitted for final approval as soon as possible, but no later than fourteen (14) calendar days.

5.11.1.4 Additionally, drawings may receive a status of VOID if the drawings are no longer applicable to the project due to changes in project scope.

5.11.1.5 Seller shall resubmit drawings within fourteen (14) calendar days of receipt. Seller will be responsible for costs associated with engineering and construction costs caused from drawings information that was changed and not back circled and clearly identified as changed from the previous submittal. When a drawing is revised and resubmitted, the Seller shall include an issue number and revision description in the drawing revision block. All revisions pertaining to that particular drawing issue shall be back circled or otherwise clearly noted on the drawing.

5.11.1.6 Drawings marked FOR INFORMATION ONLY (INF) have been filed, but have not been reviewed.

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5.11.1.7 Where comments are made that result in a Change to the Contract, the quantification and qualification of the Change shall be recorded, in writing, in a form acceptable to Buyer and submitted to Buyer within seven (7) calendar days of receipt of the returned document.

5.11.1.8 No work shall be performed in connection with the fabrication or manufacture of Equipment and materials until the drawings and data therein have been reviewed by the Buyer, except at the Seller's own risk and responsibility. Work may proceed on Equipment and materials when the drawings and data therefore have been returned marked APPROVED AS NOTED (AAN), or the Buyer's transmittal indicates a status of APPROVED (APP) or FOR INFORMATION ONLY (INF), **provided the Work is performed in accordance with the Buyer's notations and the Contract**.

5.11.1.9 If changes are made to the Equipment at the Project Site, revised drawings indicating the changes made shall be prepared by the Seller and submitted to the Buyer.

5.11.2 Liquidated Damages: Where submittal dates for drawings and data are designated as “Liquidated Damages Apply” on the SDS, the following shall apply:

5.11.2.1 Returned for Correction (RFC): When drawings/documents are returned marked RFC, for the purposes of liquidated damages, the Seller’s submittal date shall be the date the corrected, revised drawings/documents are resubmitted.

5.12 Drawings shall not be “typical” but shall actually represent the Equipment provided for this project. Drawings may be representative of two (2) units. Typical documents, e.g. valve GA/datasheets submitted for review shall be marked to identify the specific components supplied so the documents are project specific. Tag numbers shall be included and optional devices that the Seller does not intend to supply shall be specifically identified and struck out on the document so the document is project specific. Where alternatives are shown, the alternative being furnished shall be easily identifiable on that document.

6. LISTS: All lists provided by the Seller shall conform to the requirements of this Section.

6.1 Tag Numbers: Each item on a list shall have one tag number per row. The tag number and tag name description for each item shall be unique. The tag number shall exactly match (with no cross-referenced document required) the tag numbers that will be found on the nameplates of the device(s). All lists shall be updated to their final version with final tag numbers at IFC release, at which point tag numbers, tag name descriptions, and engineering information shall be correct, complete, and final.

6.2 Lists with Templates: All lists for which a template is attached to this Section shall be submitted in the format of these attached templates. These lists shall be submitted in both Excel and PDF formats.

6.2.1 Spare Parts List and Documentation: The spare parts list shall be submitted in one

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list and include the following:

a. Mandatory Construction and Commissioning Spare Parts – This shall include those parts which, based on Seller documentation, the Seller requires to be replaced during Construction and Commissioning.
b. Recommended Start-Up Spare Parts – This shall include those parts which, based on past experience, the Seller recommends having available to replace parts that may fail during Start-Up.
c. Recommended Operational and Maintenance Spare Parts – This shall include those parts which, based on its maintenance guidelines, routine operation, and past experience, the Seller believes may require replacement in the first two (2) years of plant operation.

6.2.1.1 All applicable fields of the Spare Parts List Template shall be filled out, which includes the following at a minimum:

a. Cost of each part, DDP jobsite
b. Description of the spare part
c. Sufficient information to purchase the spare part, including:
    1. If the part is readily available, a list of available suppliers for each spare part and sufficient information to purchase from any of the available suppliers.
    2. If the part is only reasonably available from a single supplier, the Component OEM supplier and OEM part number shall be specified.
    3. If the part is a commodity item, design parameters and dimensions shall be provided.
d. Recommended quantities to be stocked
e. Anticipated lead time required for manufacture and delivery
f. Relative criticality of the spare part based on the Seller's experience

6.2.1.2 The Buyer or Owner will retain the option of purchasing any quantity of any one or any combination of spare parts listed at the prices quoted until 365 days after equipment delivery.

6.2.2 Bill of Materials: The Seller shall submit a complete Bill of Materials (BOM), for each contract in the Seller's scope. The BOM is considered to be a list, so all list requirements stated in this Section shall apply to the BOM. The BOM shall include the following at a minimum:

a. Purchase Order Description
b. Purchase Order Date (required)
c. Purchase Order to Company ID (required)
d. Purchase Order Category
e. Purchase Order Status
f. Purchase Order Reference
g. Purchase Order from Company ID
h. Purchase Order Scheduled Delivery Date

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i. Item Number (required)
j. Item Description
k. Item Quantity
l. Item Unit of Measure
m. Item Unit Price
n. Item Subtotal
o. Item Budget Code
p. Item Piece Mark or Tag Number
q. Item Drawing Number
r. Item Required Delivery Date
s. Item Vendor Reference 1
t. Item Vendor Reference 2

6.2.2.1 Additionally, a physical copy of the BOM shall be included with all deliveries, which shall include information regarding which items are included in each respective delivery.

7. WIRING DIAGRAMS: Connection and interconnection wiring diagrams furnished by the Seller shall be as indicated in ANSI Y14.15a, Section 15-11, Article 15-11.3.2.1 and Figure 11-4 except that function information and wire run code are not required. Each device connection shall have near each termination, indicated in breaks, conductor identification consisting of the opposite end destination. The wiring diagrams shall be drawn with all devices indicated in their relative physical locations and shall represent the Equipment and terminals arranged as they would appear to a person wiring the Equipment.

7.1 Where interconnecting wiring from different items of Equipment or sectional wiring diagrams of the same item of Equipment appear on different wiring diagram sheets, all interconnections shall be clearly identified. Where sectional wiring diagrams are required for a single item of Equipment, such as a relay panel or control panel, that section of the panel which is represented by each individual wiring diagram sheet shall be keyed on that sheet in a manner acceptable to the Buyer.

7.2 Information indicated on the Seller's drawings shall include wiring of the individual panel items as they actually will appear in the panel, contact arrangements of switches, and internal wiring of relays and instruments.

7.3 Elementary/Schematic diagrams shall be provided for all vendor-wired and vendor-provided equipment, and shall be cross-referenced to terminal markings on the connection and interconnection diagrams, but need not indicate complete details of circuits external to the panels. Each item of panel mounted Equipment indicated on the diagrams shall be identified by item number and name.

7.4 Sufficient space shall be left on the Buyer's side of outgoing terminal blocks for adding cable color codes and circuit numbers. Color codes and circuit numbers will be added by the Buyer. The Seller shall be responsible for adding the color codes and circuit numbers to his drawings after they are assigned by the Buyer.

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8. SELLER'S STANDARD OPERATION AND MAINTENANCE (O&M) MANUALS: Instruction manuals for the unloading, storage, installation, operation, and maintenance of the Equipment shall be furnished. If the scope of the Contract is for multiple pieces of equipment, or various pieces of equipment with different functions, manuals shall be provided for all equipment components, as available from the original equipment manufacturer (OEM). The required time of manual submittal is specified in the SDS. The O&M Manual electronic file shall be set up as follows:

a. One (1) pdf file per O&M Manual
b. Electronic file shall be bookmarked by section, and set to open
c. Electronic file shall be word searchable
d. Electronic documents should be oriented such that the viewing orientation is appropriate (text shall be read from left to right, and top to bottom)
e. Any updates or inserts to the final manual shall require a new submittal containing the entire manual

8.1 A separate manual containing the approved unloading, storage, installation and SDS (if applicable) shall be shipped with the equipment within weatherproof packaging. This is in addition to the information being included in the Seller's Standard O&M Manuals.

8.2 Content: The Seller's Standard O&M Manual(s) shall consist of the information typically supplied by the Seller. In some cases this may include manufacturer cutsheet-type drawings or datasheets which may be applicable for equipment of multiple sizes or design. Documentation shall be tailored to be project specific. The data, text, curves or illustrations that are not applicable to the scope of the Contract shall be crossed out.

8.2.1 Drawings or datasheets that have been supplied that are engineered, certified, or unique only to the equipment within the Contract are not considered part of the Seller's Standard O&M Manual.

8.2.2 Furnished Equipment: Seller's Standard O&M Manuals may also include the following information specific to the furnished Equipment:

a. Table of Contents and Index Tabs
b. Generic specifications, design data, test data, and curves
c. Description of the Equipment
d. Instructions in the methods of receiving, inspection, storage, and handling prior to installation.
e. Installation instructions
f. Operating instructions including startup, emergency, shutdown, calibration, and initial testing requirements.
g. Safety Precautions
h. Maintenance instructions and routine adjustments, including recommended maintenance schedule and frequency of spare parts replacement.
i. Drawing showing space provided for equipment maintenance for equipment and any fixed facilities for maintenance such as trolley beams, etc.

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j. (Generic) List and description of all alarms and trip set points for all devices.
k. (Generic) Outline and Assembly drawings
l. Unpriced Spare Parts List
m. Component Cut Sheets
n. Trouble-shooting guides
o. (Generic) Electrical Wiring Diagrams (one-lines)
p. Safety Data Sheets (if applicable)
q. Paint and coatings manufacturer's data sheets
r. List of acceptable lubricants and lubrication instructions, which shall list points to be greased or oiled, shall recommend type, incompatibility issues with vendor supplied lubricants, grade and temperature range of lubricants, fill volumes, shall recommend frequency of lubrication, and disposal procedures for lubricants, chemicals, or other hazardous material.
s. Nameplate information and shop order numbers for each item of Equipment and component part thereof.
t. List of maintenance tools and/or special tools furnished with the Equipment.
u. Maintenance and major overhaul instructions, which shall include detailed assembly drawings with parts numbers, parts lists, instructions for ordering spare parts and complete predictive and preventative maintenance instructions required to ensure satisfactory performance and longevity of the equipment involved.
v. Manuals covering multiple models shall specifically indicate the model(s) provided. Where information does not apply to the equipment or model being supplied, this information shall be crossed-out or clearly indicated as irrelevant in the Table of Contents, or the model information can be indicated with an arrow stamp.
w. Balance records for each impeller/rotor.
x. Detailed operations on the Cyber Security System hardware, software, security related features, capabilities, and configuration of the system. The Cyber Security System includes all devices that are electronic and programmable.
y. Cleaning and conservation procedures
z. Setting and running clearances and tolerances.
aa. Dismantling and assembly procedures for equipment with associated tests and checks prior to returning equipment to service.
bb. Detailed assembly drawings to complement assembly procedures mentioned above, including parts lists and numbers for replacement ordering.

8.3 Submittal: The Seller's Standard O&M Manual(s) shall be submitted as a single electronic PDF, per the procedures identified above in this Section. Electronic manual submittals shall be bookmarked, and set to open.

9. COMPREHENSIVE EQUIPMENT MANUAL (CEM): The Comprehensive Equipment Manual (CEM) shall be compiled and supplied by the Buyer. The CEM is a compilation

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of the Seller's standard O&M Manual(s) and all other documents submitted for review/approval by the Seller. The content below is provided to the Seller as a reference point for understanding the expectations of deliverable submittals, such that Buyer can complete the production of the CEMs without undue or unnecessary delay.

9.1 Required Sections: The following Sections (or tabs) shall be the required format of the CEM, and are provided as a reference to the Seller for understanding the content and thought-process by which Buyer will compile the manuals.

a. Cover Page (containing the following):
    1. Title of the CEM
    2. Related Unit(s)
    3. Vendor Name, address and phone number
    4. System and Equipment identification number(s)
    5. Date Issued

b. CEM Table of Contents – This shall be located in front of all tabs, as the first page of the binder. If there are multiple binders/volumes for the CEM, a copy of the complete volume TOC shall be provided at the front of each binder.

c. The following standard tabs shall be provided within the CEM. Additionally, all submittals listed on the SDS shall be included in the CEM, with the exceptions of 3D Models and submittals with line numbers that begin with the following three-letter combinations: CHK, SCH, and WPK. All SDS submittals included in the CEM shall be included in the appropriate tab designated by the line number of the submittal, according to the table below.

CEM Tab	Title	Default Tab for SDS Submittals
1	Seller's Standard O&M Manual(s)	MNL
2	Procedures, Reports, and Quality Documents	CRT, ITP, NCR, PRO, QAC, RPT
3	Calculations	CAL
4	General Arrangements and Detail Drawings	GAD, DTL
5	Narratives	NAR
6	Electrical Hazardous Classifications	HAC
7	Lists	BOM, LST
8	Instrumentation & Controls Drawings and Design Information	COM, GRP, LOD
9	Electrical Drawings and Design Information	ELD, SCM
10	Mechanical Piping Drawings and Design Information	ISO, PFD, PID, PIS
11	Structural & Civil Drawings and Design Information	STS
12	Data Sheets	DTS

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CEM Tab	Title	Default Tab for SDS Submittals
13	Other Miscellaneous Documentation	PHO, SPC

d. If a document is added to the CEM that is not listed in the SDS, it shall be added to the first applicable tab in the table above (sorted numerically) with a title that describes the document.
e. For example, Instrument Data Sheets fit the descriptions of both Tab 8 (Instrumentation & Controls Drawings and Design Information) and Tab 12 (Data Sheets). Per the requirement above, Instrument Data Sheets shall be included in Tab 8, not in Tab 12.

9.1.1 It is not acceptable to omit a tab, even if that section is deemed not applicable. If one of the above tabs does not apply, then Seller shall include the tab with a page behind stating that section is not applicable.

10. SYSTEM P&IDs: The format type of the instrument, pipe line, specialty, valve and equipment tagging shall be in accordance with the Project Tagging Requirements (PTR) document. All tagging requirements shall be incorporated into the Seller's drawing(s).

10.1 Process and Instrumentation Drawings (P&ID): The Seller shall provide P&IDs including, but not limited to, the following:

a. All pipe, valves, mechanical specialties, in-line devices, process equipment, and instrumentation.
b. Pipe designations showing service, pipe size and pipe identification number as specified in the PTR.
c. Pipe symbols to differentiate between shop-installed piping and field-installed piping.
d. Instrumentation tag numbers as specified in the PTR
e. Valve tag numbers as specified in the PTR
f. Mechanical Specialties tag number as specified in the PTR
g. Pressure set points for safety and relief valves
h. Interface connections including pipe size, schedule, ASTM material, type of end connection, etc.
i. Legend for all symbols used

11. DESIGN LOADS FOR FOUNDATIONS: The Seller shall provide and submit all the foundation interface loads and location drawings providing all dead, live, wind, and seismic loads in a tabulated type format based on the project design codes and values specified in Section GR-A and S1.

12. RECEIVING AND INSTALLATION: Written instructions for the unloading, receiving, handling, long and short term storage, and installation of the Equipment shall be furnished by Seller per the requirements below. In the event the written instructions are not

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received by Buyer 30 calendar days prior to Delivery, Buyer reserves the right to delay offloading until such time written instructions are received and reviewed. The required Delivery dates are specified in the Agreement.

12.1 Receiving Requirements: All requirements for unloading, receiving, handling, and long and short term storage shall be provided. At a minimum, these requirements shall include the following:

a. A description of the Equipment including Equipment Tag Numbers and manufacturer model numbers
b. Instructions for receiving, unloading and inspection of the Equipment, including reference to any special handling required during unloading
c. Center of gravity and weight (lbs) indicated on drawings included in the written instructions and clearly indicated on the equipment prior to Delivery
d. Drawings of any special lifting devices or rigging provided by Seller
e. Instructions for long and short term storage of the Equipment, including reference to type of storage required (outdoor, indoor, climate controlled, etc.), type of utility connections required during storage, and instructions for required in-storage maintenance

12.2 Installation Sequence and Procedure: Detailed installation sequences and procedures shall also be provided. At a minimum, these sequences and procedures shall include the following:

a. Sequence of installation
b. Lifting plans, piping and utility connections
c. Grouting instructions, or any other similar requirements
d. Copies of outline or arrangement drawings of the Equipment.

13. SCHEDULE: The time durations listed in the SDS indicate the latest dates by which the listed activities shall be completed. Data, drawings, and lists for planning, engineering, and documentation may be submitted earlier than the indicated dates at the Seller's option.

14. SELLER PRODUCTION SCHEDULE: Seller shall submit monthly engineering and fabrication/manufacturing progress reports by item or tag number. As a minimum these reports must state the following:

a. Progress of engineering, including scheduled release of drawings and data, and/or release of drawings to fabricator/manufacturer.
b. Progress of work in shop on a percentage completion basis.
c. PO issue date for each major item of procurement.
d. List of all impacts or delays from the SDS.
e. Change Order Log including all change orders in progress or identified to be submitted.
f. Photographs of work in progress that substantiates progress reported.
g. Commodity curves and detailed reporting of all major sub-vendors.

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h. Scheduled receipt of Seller shipments of major buy-out equipment or materials.
i. Scheduled date for all inspection activities.
j. Scheduled shipping date for each item or tag number.
k. Payment status for Contract.
l. Any substantial change to the Seller's financial status.

15. ENGINEERING AND DESIGN SOFTWARE/3-D MODELING: Seller shall provide a copy of any 3D model(s) generated so it can be loaded into the Buyer's 3D model. The Seller shall place all models on the project coordinates provided by the Kiewit Engineering project leads. Seller's model shall be an accurate physical representation of the equipment being designed, and shall include smaller components such as valves, pipe supports, instrumentation, door swing allowance, equipment disassembly areas, allowances in connections and platforms for thermal movements, equipment, piping and equipment insulation, etc. Excessive detail in the model that causes the file to be too large to easily manage in the overall facility model, shall be omitted. Seller shall work with the Buyer to determine the necessary amount of detail and acceptable file size for the 3D model. The model shall be submitted monthly and shall be up to date. The model shall be compatible with NavisWorks and MicroStation.

END OF SECTION

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