Specification for Material and Application of Fusion Bonded Epoxy Coating on Line Pipe
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1. **SCOPE**

This specification describes materials, surface preparation, application, quality control and repairs of external fusion bonded epoxy anti-corrosion coating for flowlines and bundle casing pipe for a flowline bundle to be installed in BP Exploration, Inc.'s (BPX) Green Canyon Block 200 Development Project (Troika).

2. **DEFINITIONS**

   a) **COMPANY**

   b) **CONTRACTOR** The organization, person or company that contracts with COMPANY to apply coating according to this specification.

   c) **CONTRACT** The entire written agreement between CONTRACTOR and COMPANY.

   d) **Nonconformity** An instance of failure to meet contractual requirements, including physical, procedural or performance deficiencies.

3. **REFERENCES**

The appropriate sections and supplements of the latest versions of the following codes, standards and guidelines are incorporated by reference as a part of this specification. Where there are conflicts, the referenced specifications shall apply until the COMPANY can make a determination on the conflict.

   a) **National Association of Corrosion Engineers**

   b) **Steel Structures Painting Council**

   c) **International Standards Organization**

   d) **American Society for Testing and Materials**

   e) **American Petroleum Institute**

   f) **COMPANY Specifications:**

   - Specification for Seamless Steel Line Pipe for Flowlines
   - Specification for Steel Line Pipe for Bundle Casing
   - Specification for Steel Line Pipe for Heating Lines

   NACE RP-04-90 Holiday Detection of Fusion-Bonded Epoxy External Coating of 10 to 30 mils

   - Solvent Cleaning
   - White Metal Blast Cleaning
   - Near White Blast Cleaning
   - Visual Standard for Abrasive Blast Cleaned Steel

   - ISO 1519 Paints and Varnishes - Bend Test (Cylindrical Mandrel)

   - ASTM D 4417 Test Method for Field Measurement of Surface Profile of Blast Cleaned Surface

   - API RP-5L7 Recommended Practice for Unprimed Internal Fusion Bonded Epoxy Coating of Line Pipe
4. CONTRACTOR RESPONSIBILITIES

4.1 GENERAL

CONTRACTOR shall provide all labor, materials, tools and equipment and shall undertake all inspection, handling, reporting, storage and shipping necessary to do the work required in this specification and the CONTRACT. If CONTRACTOR believes this specification conflicts with other terms of the CONTRACT, CONTRACTOR shall inform COMPANY and resolve the conflict by the terms of the CONTRACT.

4.2 SUBCONTRACTORS

CONTRACTOR shall be responsible for the actions and performance of its Subcontractors.

4.3 REPORTING AND APPROVALS

4.3.1 CONTRACTOR Work Plan

Thirty days before work begins, CONTRACTOR shall submit and receive written approval for a work plan for performing the work required by this specification and the CONTRACT. The work plan shall include but will not be limited to:

a) Detailed work schedule
b) Procedures for surface preparation and coating

c) Abrasive cleaning procedure and coating materials to be used
d) Testing procedures
e) Procedures for pipe handling, transportation and storage according to COMPANY Specification No. SP-051
f) Procedures for identifying, documenting, and segregating or disposing of non-conforming materials
g) Quality control of materials and applications
h) Method and equipment for application
i) Description of all major equipment used to coat the line pipe

4.3.2 Disposition of Non-Conforming Materials

CONTRACTOR must submit bi-weekly summary reports of all non-conformities and their disposition. Dispositions of non-conforming materials should be categorized as "scrap," "rework," or "use as is." The report also should include a full description. If a non-conformity cannot be eliminated by replacement or by a procedure set out herein, then immediately upon its occurrence or discovery, CONTRACTOR shall inform COMPANY and propose a disposition. Dispositions shall be approved in writing by the COMPANY according to the terms of the Purchase Order. COMPANY may reject coating that does not conform to these specifications. CONTRACTOR shall not allow repairs or replacements to delay the delivery schedule or increase costs to COMPANY.

4.4 PROJECT DOCUMENTS

Project documents shall be in English, prepared in basic US sizes of 8.5" wide by 11" long and progressively larger related paper sizes.
The system of units for project documents shall be customary US units.

4.5 DEVIATIONS AND DISCLAIMERS

Work done under this specification shall be according to all requirements herein, without deviations and disclaimers. If COMPANY approves changes, they will be incorporated into a revised specification and this specification will be void.

4.6 RECORDS

CONTRACTOR shall keep current and complete records that reflect the work performed under this specification. These records shall be indexed and legibly recorded with sufficient detail to be used and understood by a qualified, independent third party. In absence of other instructions, CONTRACTOR shall keep these records available to COMPANY for inspection or photocopying for five years. The records should include:

a) A description of each test or inspection and its results, with a reference to the section number of the test requirement of this specification
b) The date of the test or inspection
c) The name and qualifications or authority of the inspector or reviewer and his employer
d) Evidence of calibrations
e) Production History Report
f) CONTRACTOR shall record pertinent information about non-conforming materials or test failures including:
   • Material condition that caused rejection
   • Method of detection
   • Number of items involved, if more than one

• Proposed and actual disposition
• Preventive action taken
g) All information needed for the reports required in Section 4.3 of this specification

4.7 INTERACTIONS BETWEEN CONTRACTOR AND COMPANY

CONTRACTOR shall allow COMPANY access to all facilities and processes for the purposes of monitoring, surveillance and inspection, including but not limited to:

a) Review of adequacy of facilities and equipment
b) Review of personnel qualifications
c) Performing or witnessing inspections, tests and analyses COMPANY deems necessary to confirm compliance with requirements of this specification

CONTRACTOR shall give COMPANY notice of the production start and all tests and inspections required herein. The number of days notice prior to production start or any tests shall be according to the requirements of the CONTRACT. CONTRACTOR shall provide all reasonable facilities to COMPANY for the above purposes. Such facilities shall include office equipment, telecommunications equipment and temporary office work space.

4.8 ON-SITE DOCUMENTS

CONTRACTOR shall have copies of all specifications, references and other documents relating to the work at the site and available for CONTRACTOR personnel.

5. GENERAL SPECIFICATIONS
5.1 COATING THICKNESS

The finished coating shall be uniformly applied over the specified area to a dry film thickness which varies no less than 15 mils minimum thickness or more than 22 mils maximum thickness.

5.2 AREA TO BE COATED

All pipe specified in the CONTRACT shall be coated over the external surface of the pipe joint between “cutback” areas approximately two inches from each end. The cutback and beveled area shall be free of coating.

5.3 MATERIALS

The coating material shall be a COMPANY-approved rapid curing, fusion bond, epoxy resin and catalytic epoxy curing agent, together in a powder form. The following coating materials are acceptable, although CONTRACTOR may submit alternatives for consideration.

a) Interpon HD3005
b) Lilly 1,500
c) Scotchkote 206N
d) Napguard 2501

However, for the casing pipe a rust color FBE or equivalent is required for providing a non-reflective surface under ROV lighting used subsea. CONTRACTOR shall obtain a written test certificate from the Manufacturer for each test the Manufacturer performed on the powder. Powder shall not be used more than one year after manufacture. If the powder is to be used more than three months after it was received by the CONTRACTOR or more than six months after it was manufactured, then CONTRACTOR shall perform acceptance tests described in Section 6.6.1 of this specification.

5.4 FINISH

The cured coating shall have a smooth, uniform color and finish, without blisters, pinholes, craters, orange peel, runs, sags or other irregularities.

6. APPLICATION AND IN-PROCESS TESTING

6.1 HANDLING, TRANSPORTATION AND STORAGE OF LINE PIPE

CONTRACTOR shall handle, transport and store line pipe according to COMPANY Specification No. SP-051.

6.2 HANDLING AND STORAGE OF COATING MATERIALS

CONTRACTOR shall follow the Coating Manufacturer’s directions for storage of coating materials. Any material detrimentally affected by climate or storage conditions will be rejected and replaced by the CONTRACTOR. CONTRACTOR shall keep moisture and dirt out of the coating material. Mixing or use of coating materials shall be done in an area protected from the weather. Each batch of material shall be indelibly marked with the name of manufacturer, trade name or number under which the material is sold, batch number, date of manufacture and date received by the CONTRACTOR.

6.3 EQUIPMENT

6.3.1 Condition of Equipment
All equipment and tools furnished by the CONTRACTOR shall be suitable, of good quality and well maintained to apply quality coating materials.

6.3.2 Rubber Wheels

All wheels and rollers which contact the pipe shall be made of, or overlaid with a resilient material such as a hard elastomer or fibrous materials to prevent marking or indenting the pipe or the pipe coating. Bare steel or knurled rollers capable of marking, indenting or damaging the line pipe or coating may be used only in limited applications after approval by COMPANY. COMPANY may allow the use of steel wheels for electrical grounding or for conveying pipe through the furnace if CONTRACTOR can demonstrate that neither pipe nor coating damage occurs.

6.4 SURFACE PREPARATION

6.4.1 Inspection before Cleaning

Before preparation of the pipe surface, CONTRACTOR shall visually examine the line pipe for dents, laps, defective bevels and other obvious defects to avoid coating unusable pipe. CONTRACTOR shall keep a record of pipe joints found damaged and joints whose surface is extremely rough and/or slivered. If light grinding cannot correct line pipe joints to compliance standard with the applicable COMPANY Specification Nos. PS-1001, SP-002, SP-010 and SP-011, the pipe joints shall not be coated. Otherwise, line pipe repaired by grinding shall be re-inspected for COMPANY approval.

6.4.2 Washing

No pressure wash is required.

6.4.3 Bevel Protectors and End Caps

CONTRACTOR shall use pipe end cap covers to prevent the coating material from entering the bore. All visible abrasive remains from blasting shall be removed from inside the pipe before the ends are capped.

6.4.4 Preheating

CONTRACTOR shall preheat the external pipe surfaces and maintain the surface at least 5 degrees above the dew point or 90° F minimum through the abrasive cleaning operation. CONTRACTOR shall use a heat source that leaves no residue or contamination on the surface of the pipe.

6.4.5 Abrasive Cleaning

Before production begins, the method of abrasive grit blasting shall be demonstrated to comply with the methods of SSPC Vis 1-89 and ASTM D 4417.

The external surface of the pipe joints shall be abrasive grit blasted to a "near white metal" finish according to SSPC SP-10. The anchor pattern profile shall be between 2.5 mils and 4 mils according to ASTM D 4417. A stable working mix of cleaning media shall be supported by frequent small added quantities of new grit in balance with consumption. Infrequent large additions should be avoided. The abrasive mix should be kept clean and free of contaminates by continuous effective operation of blasting machine scalping and air separators. The abrasive mix shall be selected to achieve specified results following the Powder Manufacturer directions and the CONTRACTOR work plan in section 4.3.1 of this specification.

6.4.6 Detailed Bare Metal Inspection

CONTRACTOR shall clean and inspect the entire line pipe joints according to SSPC Vis 1-89 under good illumination (500 lux)
immediately after blasting. Slivers, swabs, burrs, lamination and gouges shall be removed by grinding. CONTRACTOR shall reblast any ground area larger than 0.5 square feet and all ground spots on pipe joints with total ground areas exceeding two square feet. CONTRACTOR shall remove all visible dust, filings and abrasive particles with brushes. COMPANY may approve the use of compressed air systems that delivers clean, dry, oil-free compressed air for the removal of such debris. Pipe joints which have not been coated within six hours after blasting or that have rust formation shall be re-blasted.

6.4.7 Acid Wash

After other surface preparations are complete and immediately before coating, CONTRACTOR shall apply an acid wash as follows:

a) CONTRACTOR shall use a phosphoric acid base metal cleaning wash solution comparable to Oakite 31 manufactured by Oakite Products, Inc., or Foxbond 0, manufactured by US Polychemical Corporation or other COMPANY approved wash solution.

b) The product shall be mixed and applied according to the CONTRACTOR Work Plan and Manufacturer directions.

c) CONTRACTOR shall leave the wash solution on the pipe for at least twenty seconds while the pipe temperature is between 110 °F and 150 °F. At the discretion of COMPANY, the treatment time may be extended by one second for each degree of pipe temperature below 110 °F.

d) CONTRACTOR shall remove the wash solution with a pressure washer operating at 600 to 800 psi, and using at least 2.5 gallons of clean, fresh de-ionized water per 100 square feet of pipe.

e) CONTRACTOR shall dry the pipe joints with dry, oil-free compressed air.

f) CONTRACTOR shall handle and dispose of the phosphoric acid waste from the acid wash following directions of the manufacturer and requirements of government regulatory authorities with jurisdiction over the coating facility location.

6.5 COATING APPLICATION

6.5.1 Pipe Preheating

After the acid wash, CONTRACTOR shall heat the pipe surface to a temperature between 450 °F to 488 °F and within the limits specified by the Powder Manufacturer. Maximum pipe temperature shall not exceed 540 °F, even if the temperature is reduced before coating application. Formation of blue oxide on the pipe surface shall be considered as overheating.

Overheated pipe in excess of 540 °F shall be set aside as designated in the CONTRACTOR Work Plan. Overheated pipe shall be replaced by CONTRACTOR unless COMPANY accepts the pipe after evaluation of laboratory tests performed at CONTRACTOR expense.

Heating shall be done with a smoke-free gas-fired radiant heat, electrical induction or a heat-soak convection oven, described in CONTRACTOR Work Plan. CONTRACTOR shall monitor pipe surface temperatures with an infra-red temperature measuring device, unless COMPANY accepts another method that CONTRACTOR presents as effective. COMPANY may approve temperature indicating crayons if CONTRACTOR demonstrates them to be compatible with
the coating, and the crayon test area is limited to 1/8 inch wide by 1/2 inch long. Pipe joint surface temperatures shall be uniform at the specified temperature levels.

6.5.2 Masking

Beveled ends and cutbacks shall be masked or otherwise shielded from shotgrit and coating overspray. CONTRACTOR shall remove coating deposited on these areas.

6.5.3 Reclaimed Powder

CONTRACTOR may use reclaimed powder after impurities have been removed using methods and equipment approved by the Powder Manufacturer. CONTRACTOR shall attach the Powder Manufacturer approval or recommendations to the CONTRACTOR Work Plan. The proportion of reclaimed powder in the working mix shall not exceed 20 percent.

6.5.4 Method of Application

CONTRACTOR shall use COMPANY approved thermosetting epoxy powder that has been verified according to Section 6.6.1 of this specification. CONTRACTOR shall apply powder electrostatically, using automatic or semiautomatic spraying. The spray guns shall be positioned in the coating chamber to deposit powder uniformly. The coating shall be applied in one pass through the coating hood, unless otherwise approved by COMPANY. Air used in spraying shall be dry and free of contamination. CONTRACTOR shall use minimum spray pressures for good results to avoid excessive overspray.

Before coating pipe, CONTRACTOR shall perform tests to determine the rate of powder delivery for the specified cured coating thickness. CONTRACTOR shall use test experience to adjust the spray gun distance from the pipe, the line speed and the air pressure necessary to give optimum coating with uniform cured film thickness in the range 15 to 22 mils.

6.5.5 Primer

No surface primer is required.

6.5.6 Curing

CONTRACTOR shall take steps to ensure that the pipe surface remains hot enough and long enough to completely cure the coating following Powder Manufacturer's directions. Powder melt, gel time, reaction time and coating temperature before water quenching of the pipe shall follow the Powder Manufacturer's directions. CONTRACTOR may not quench the pipe with water earlier than one minute for large diameter pipe and 30 seconds for small diameter pipe after the pipe leaves the coating chamber.

6.5.7 Marking

If the paint stenciled pipe markings applied by the pipe mill are removed in the coating process, then CONTRACTOR shall record and paint stencil the markings on the pipe after coating. In such cases, the pipe serial number shall be marked, on the inside of the pipe before the outside markings are removed for control to eliminate any chance for the pipe to lose its identity.

6.5.8 Bevel Protectors

If bevel protectors were removed to install pipe caps, CONTRACTOR shall replace the bevel protectors before pipe shipment or storage.

6.6 IN-PROCESS TESTS AND INSPECTION

6.6.1 Epoxy Powder Acceptance Test

6.6.1.1 General

Specification for Material and Application of Fusion Bonded Epoxy Coating on Line Pipe
CONTRACTOR shall verify that the properties of the epoxy powder are within specified limits of the Powder Manufacturer. Manufacturer's certificates, required in Section 5.3 of this specification, will be accepted as verification that the powder is used less than six months after date of manufacture and less than three months from Manufacturers shipping date. If the powder is to be used more than three months after delivery to the CONTRACTOR or more than six months after manufacture, CONTRACTOR shall perform acceptance tests described in this section.

### 6.6.1.2 Glass Transition and Heat of Reaction Determination

If necessary, powder requiring acceptance tests shall be qualified by testing with a differential scanning calorimeter by the method of Appendix 5 of API RP-5L7.

### 6.6.1.3 Gel Time Determination

Powder requiring acceptance tests shall be qualified by testing gel time by the method described in the Powder Manufacturer’s directions or Appendix 4 of API RP 5L7. One test for each shipment of powder is required.

### 6.6.2 Destructive Tests of Coating Properties

#### 6.6.2.1 General

The first coated pipe joint of a specific OD shall be tested according to the requirements of this section. COMPANY shall be informed of any changes in procedure and COMPANY shall determine if additional testing is required.

#### 6.6.2.2 Test Samples

The test samples shall be taken from one pipe end, cut twelve (12) inches long.

CONTRACTOR shall mark the coating date and pipe serial number on the unused section of pipe end. The ends of the remaining pipe joints shall be rebeveled according to the COMPANY pipe specification. The test samples shall not be taken from the pipe joint end with the steel mill control die punch serial number. The pipe ends must be re-beveled and UT inspected.

#### 6.6.2.3 Porosity

CONTRACTOR shall examine a test specimen under a forty-power microscope according to Appendix 15 of API RP-5L7. The coating shall be rejected if porosity rating is greater than eight (8).

#### 6.6.2.4 Contamination Test

CONTRACTOR shall take a test specimen described in Appendix 15 of API RP-5L7 and examine the metal interface surface with a 40-power stereo microscope. The coating shall be rejected if more than 30% of the surface shows interface contamination. This shall be determined by counting the points of contamination in several grid sections where the grid size shall be large enough to include at least 25 points.

#### 6.6.2.5 Bend Test

CONTRACTOR shall do bending tests on cut pipe samples to show that the coating will withstand 1.5% bending strain without cracking or disbonding. Tests shall be done according to API RP-5L7.

#### 6.6.2.6 Cathodic Disbondment

CONTRACTOR shall carry out cathodic disbondment tests on each test coupon using the methods of API RP-5L7, section 5.3.3.2 as modified in the following procedure:
CONTRACTOR shall drill a 1/8-inch diameter hole through the coating and immerse the punctured area in a three (3) percent salt solution at 150 °F. A three volt electrolytic current shall be applied for twenty-four (24) hours. Voltage, time and temperature shall be recorded six times at intervals of four (4) hours. The duration of the test shall be twenty-four (24) hours. If coating disbondment extends no more than 5/16 inch from the drilled hole, the test shall be deemed successful. If the disbondment extends between 5/16 inch and 7/16 inch from the hole, the test shall be repeated. If the disbondment in the second test is less than 7/16 inch the test shall be accepted. If the disbondment is greater than 7/16 inch in either test, then other pipe joints shall be tested as required in API RP-SL7.

6.6.3 Non-Destructive Examinations

6.6.3.1 Visual Inspection of Blasted Surface

After blasting, CONTRACTOR shall visually inspect the blasted surface of each pipe according to SSPC Vis 1-89.

6.6.3.2 Visual Inspection of Finished Coating

CONTRACTOR shall visually inspect the integrity and uniformity of all of the coating on each pipe. Discontinuities or abnormalities, such as orange peel, unused over spray, fish eyes, inclusion and contamination shall be circled with a waterproof marker. Markings shall be far enough from the holiday, imperfection or damaged area to allow surface preparation and patching to take place without obliterating the markings.

6.6.3.3 Holiday Detection

a) CONTRACTOR shall verify the continuity of the coating and detect voids or holidays by using an electric holiday spark tester according to NACE RP-04-90. The operating voltage of the detector shall be 125 volts per mil of thickness, properly maintained throughout the testing work, and shall be controlled by routine checking and resetting, at least twice daily: once just before starting work in the morning and once before starting in the afternoon. The spark tester should be grounded according to the instructions of the Manufacturer.

b) The detector's signal shall be easily noticeable by the operator and close bystanders in the background noise prevailing at the site, even if this requires both audio and visual signals.

c) All holidays, imperfections and damaged areas shall be circled with a waterproof marker. Markings shall be far enough from the holiday, imperfection or damaged area to allow surface preparation and patching to take place without obliterating the markings.

6.6.3.4 Thickness Test

Each pipe joint shall be examined at least at five (5) points along its length for coating thickness, using thin coating thickness gauge approved in the CONTRACTOR Work Plan of Section 4.3.1 of this specification. The coating thickness shall be a minimum of 15 mils and the maximum thickness at any point shall be no more than 22 mils.

6.6.3.5 Differential Scanning Calorimetry (DSC)

One DSC test will be taken per day from a ring sample.

6.7 CAUSES AND REMEDIES FOR REJECTION

6.7.1 General
Failure to conform to the requirements herein shall be cause for rejection. The following sections describe some causes and remedies for rejection.

6.7.2 Thickness

CONTRACTOR shall remove and re-apply the coating from pipe with a minimum coating thickness of less than 15 mils.

6.7.3 Pipe Preparation

Pipe joints that fail to meet the specified roughness and cleanliness requirements shall be rejected. Coating so rejected shall be removed and reapplied.

6.7.4 Coating Properties

Failure of any test in Section 6.6.3 of this specification shall result in rejection of all pipe joints that were coated between successfully tested pipes. A successfully tested pipe joint is one which has passed all the tests. CONTRACTOR may elect to test additional pipe joints to reduce the number rejected but the cost of such additional tests and the pipe joint used for the samples shall be for the cost of the CONTRACTOR.

6.7.5 Localized Defects

Pipe joints with more than five areas of unbonded or nonadherent coating for pipe sizes less than 12.75" OD, or pipe joints with more than twenty (20) individual, small damaged areas for pipe sizes greater than 12.75" OD, holidays or pinholes, shall be rejected. CONTRACTOR shall remove the coating and clean and recoat it after inspecting the pipe joint for damage. Repairs shall be done without removing the markings made according to Sections 6.6.3.2 and 6.6.3.3 of this specification. COMPANY shall make exceptions to the number of localized defects found on pipe joints with extremely rough and/or slivered pipe surface which the CONTRACTOR had recorded during inspection as stated in Section 6.4.1.

6.7.6 Repair Procedures

No repairs will be allowed within six inches of a pipe end. Pipe joints with fewer or smaller damage defects than described in Section 6.7.5 of this specification may be repaired by following a process described in the CONTRACTOR Work Plan. The damaged area shall be thoroughly roughened with 80 grit paper to remove all loose or damaged coating. Melt sticks may be used only for pinholes less than 1/32-inch in diameter. Touch up sticks should not be used for any other repairs.

Patching compounds shall be compatible with and shall adhere to the epoxy powder and shall be approved by the Powder Manufacturer. Patches shall overlap the surrounding undamaged coating by at least one half inch. If the patching system has several components, CONTRACTOR shall mix in the portions specified by the Coating Manufacturer.

CONTRACTOR shall apply the coating within the specified workable pot life to give a smooth patch of the specified thickness. Thinners shall not be used. In cold conditions, CONTRACTOR shall preheat the area of pipe coating to be repaired. CONTRACTOR shall not handle the pipe until the repair has cured completely. Any slivers detected should be removed by light grinding with means that will maintain the required anchor profile. All repairs shall be visually inspected, tested with a holiday detector and accepted by the COMPANY.
APPENDIX A
SUMMARY OF TEST REQUIREMENTS

Table 1 - Powder Acceptance/Qualification Tests (if Powder is 3 to 6 months old)

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<th>Glass Transition/Heat of Reaction</th>
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<td>API RP-5L; {Sec. 6.6.1}</td>
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Table 2 - Frequency of Tests on Coated Pipe

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<th>Porosity</th>
<th>Contamination</th>
<th>Bend Test</th>
<th>Cathodic Disbondment</th>
<th>Holiday Detection</th>
<th>Thickness</th>
<th>DSC</th>
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<tr>
<td>Frequency</td>
<td>1st 2 joints &amp; 1 per 200 joints or one per shift</td>
<td>each pipe</td>
<td>1 per day</td>
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<td></td>
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<td>{Sec. 6.6.2.4}</td>
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APPENDIX B
VENDOR DATA REQUIREMENTS LIST (VDRL)

CLIENT: __________________________ P.O. NO.: __________________________

LOCATION: Gulf of Mexico SELLER/SUBCONTRACTOR: __________________________

EQUIPMENT TAG NO.(S): __________________________

DESCRIPTION(S): Fusion Bonded Epoxy Coating of Line Pipe

The seller's/subcontractor's quotation shall state his intended compliance with this listing, as regards to the type of data required and schedule for data submittal, as well as the quantity and data form (reproducible, prints, etc.) indicated in the inquiry and purchase order/subcontract standard clauses. The seller/subcontractor shall confirm responsibility for similar compliance by his subvendors and/or subcontractors.

As a part of the seller's/subcontractor's quotation, any deviation(s) from the data submittal schedule shall be shown in the comments column.

All data submitted shall be identified with equipment tag number, equipment description, buyer's job number, and purchase order/subcontract number.

AFTER ORDER IS PLACED, UNLESS OTHERWISE NOTED IN THE COMMENTS COLUMN, the following data submittal schedule shall apply:

FOR APPROVAL DATA DUE ___ WEEKS AFTER PURCHASE ORDER/SUBCONTRACT IS PLACED,

CERTIFIED CORRECT DATA DUE ___ WEEKS AFTER BUYER'S APPROVAL, RECORD DATA DUE ___ WEEKS AFTER PURCHASE ORDER/SUBCONTRACT IS PLACED.

ABBREVIATIONS: Q = With Quotation, A = Approval, C = Certified,
R = Record, P = Prints, RP = Reproducible,
M = Microfilm, S = Shutdown
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## APPENDIX C
### INSPECTION MATRIX

<table>
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<tr>
<th>APPROVAL DATE</th>
<th>INSPECTION LEVEL: A</th>
<th>INSPECTION LEVEL:</th>
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<tr>
<td>SPECIFICATIONS/CODES/STANDARDS:</td>
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<td>See Section 3 of this specification.</td>
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<tr>
<td>Other sections listed below are references to information within this specification.</td>
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<tr>
<td>B = One or More In-Process Insp., Witness Tests, Final Inspection, Doc. Review</td>
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<td>C = Witness Tests, Final Insp., Doc. Review</td>
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<tr>
<td>D = No Inspection, Review Vendor Submitted Documentation (if applicable)</td>
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### INSPECTION ACTIONS:

1 = Observe/Verify by Inspection
2 = Review of Documentation
3 = Obtain Certification/Test Documents
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<th>ACTIVITIES</th>
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<tr>
<td>1  Pre-Fabrication Meeting</td>
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<td>3  Contractor's Quality Plan</td>
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<td>5  Locate FBE Powder, Trace To Certificates, Verify Marking/Age</td>
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<td>6  Transportation, Handling Storage</td>
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<td>7  Segregating Damaged Pipe</td>
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