

	PER CO #7817	Approved By <i>[Signature]</i> 4/15/04	Effective Date APR 15 2004	Document No. 62112	Revision A
	Originator <i>SKT</i> JOHN TERRY	Checked By <i>[Signature]</i> 4/15/04	Page 1 of 15	Reference OPM-222/223-23	Class 23

SUBJECT: MBARI MOOS MOORING BOUY CABLE TERMINATION, D/N 61040 (OPM-222-01) & D/N 61041 (OPM-223-01) FIELD INSTALLATION PROCEDURE

CUSTOMER: _____

CUSTOMER REPRESENTATIVE: _____

PROJECT: _____

JOB NUMBER: _____

UMBILICAL ID: _____

DATE: _____

TECHNICIANS: _____

THE FOLLOWING PROCEDURE IS TO BE USED FOR FIELD INSTALLATION OF PARTS DESCRIBED BY D/N'S 61040 (OPM-222-01) & 61041 (OPM-223-01). PRIOR TO ASSEMBLY, LAY OUT THE MATERIAL NEEDED FOR EACH COMPLETED TERMINATION IN KIT FORM. VERIFY KIT IS COMPLETE WITH THE ASSEMBLY DRAWING.

MATERIAL REQUIRED:

- D/N 61040 (OPM-222-01) ASSEMBLY DRAWING OR
- D/N 61041 (OPM-223-01) ASSEMBLY DRAWING
- D/N 14219 (FIB-201-01) SUBASSEMBLY DRAWING
- D/N 31321 (SOP-064-39) 3M SCOTCHCAST PREPARATION PROCEDURE
- D/N 34137 (SOP-066-39) FIELD VERIFICATION TEST OF CABLE BREAKOUT INSULATION INTEGRITY
- D/N 55115 (ATP-050-40) FITA FIELD ACCEPTANCE TEST PROCEDURE
- D/N 10555 (MAN-22.0) HIGH RELIABILITY SOLDERING SPECIFICATION
- LOCTITE 222, 290, 425
- HEATING FIXTURE
- DC-4 DOW CORNING DIELECTRIC LUBRICANT
- STRIPPERS, CUTTERS, ETC.
- TIOLON X20 SPRAY

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<u>TEST EQUIPMENT</u>	<u>TYPE</u>	<u>S/N</u>	<u>NEXT CAL</u>
MEGGER	_____	_____	_____
MULTIMETER	_____	_____	_____
PRESSURE GAUGE	_____	_____	_____
_____	_____	_____	_____

OPERATOR INITIALS: _____ DATE: _____

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PROCEDURE:

1. PRIOR TO PERFORMING ANY WORK, DISCUSS WITH THE CUSTOMER/MANUFACTURING REPRESENTATIVE THE DETAILS OF THE TERMINATION; INQUIRE ABOUT THE MOUNTING DETAILS ANY SPECIAL REQUIREMENTS/PROCEDURES AND OBTAIN AN APPROVED CIRCUIT DIAGRAM AND TERMINATION LENGTH. INFORM THE CUSTOMER OF THE TESTS THAT ARE TO BE PERFORMED AND THAT THEY MAY WITNESS IF THEY DESIRE.

TERMINATION LENGTH: _____

OPERATOR INITIALS: _____ DATE: _____

CUSTOMER INITIALS: _____ DATE: _____

2. VERIFY THERE ARE NO VISUAL/OBVIOUS DEFECTS ON THE CABLES FOR ANY ACCESSIBLE LENGTH. RECORD OBSERVATIONS BELOW. IF DEFECTS ARE FOUND, A CUSTOMER CONCESSION MUST BE OBTAINED. DOCUMENT WITH A DIGITAL PHOTO IF AVAILABLE.

OPERATOR INITIALS: _____ DATE: _____

CUSTOMER INITIALS: _____ DATE: _____

3. PRIOR TO TERMINATION, VERIFY CABLE CONTINUITY, INSULATION RESISTANCE AT 500 VDC, AND OPTICAL INSERTION LOSS AT 1310 nm PER D/N 55115 (ATP-050-40). RECORD RESULTS ON D/N 55115 (ATP-050-40) AND ATTACH TO THIS INSTALLATION PROCEDURE. IR ACCEPTANCE IS $\geq 1 \text{ G}\Omega$.

OPERATOR INITIALS: _____ DATE: _____

4. PRIOR TO TERMINATION, "DRY" FIT THE MAJOR COMPONENTS TOGETHER TO ENSURE ALL COMPONENTS CAN BE PROPERLY ALIGNED

OPERATOR INITIALS: _____ DATE: _____

5. CUT THE CABLE SO IT HAS A CLEAN, SQUARE END.

OPERATOR INITIALS: _____ DATE: _____

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6. MAKE A MARK AT LEAST 50" FROM THE END OF THE CABLE. THIS WILL ALLOW FOR ENOUGH FIBER TO SPLICE TO IN SUBSEQUENTS ASSEMBLY STEPS.

OPERATOR INITIALS: _____ DATE: _____

7. LUBRICATE THE CABLE TO FACILITATE INSTALLATION OF COMPONENTS.

OPERATOR INITIALS: _____ DATE: _____

8. SLIDE THE CUSTOMER SUPPLIED BEND RESTRICTOR OVER THE CABLE AND BACK PAST THE MARK.

OPERATOR INITIALS: _____ DATE: _____

9. SLIDE THE CUSTOMER SUPPLIED DORN FITTING COMPRESSION PLATE OVER THE CABLE AND BACK PAST THE MARK.

OPERATOR INITIALS: _____ DATE: _____

10. CLEAN AND LIGHTLY LUBRICATE THE I.D. AND O.D. OF THE DORN CABLE FITTING RUBBER PACKING. SLIDE THE RUBBER PACKING AND THE SMALL WASHER OVER THE CABLE AND BACK PAST THE MARK.

OPERATOR INITIALS: _____ DATE: _____

11. SLIDE THE TERMINATION CONE OVER THE CABLE AND BACK PAST THE MARK.

OPERATOR INITIALS: _____ DATE: _____

12. MAKE A SECOND MARK ON THE CABLE APPROXIMATELY 4" FORWARD OF THE FIRST MARK.

OPERATOR INITIALS: _____ DATE: _____

13. FOR CABLE TERMINATION P/N 1033545 (OPM-222-01), REMOVE THE OUTER JACKET UP TO THE SECOND MARK TO EXPOSE THE KEVLAR. FOR CABLE TERMINATION P/N 1033607 (OPM-223-01), REMOVE THE FISHBITE PROTECTION AND THE OUTER JACKET UP TO THE SECOND MARK TO EXPOSE THE KEVLAR.

OPERATOR INITIALS: _____ DATE: _____

14. TRIM THE KEVLAR TO APPROXIMATELY 3-3/4" TO ALLOW FOR POTTING. USE THE TERMINATION CONE AS A GAGE IF NECESSARY.

OPERATOR INITIALS: _____ DATE: _____

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15. CLEAN AND LIGHTLY SAND THE INNER JACKET AS REQUIRED TO ACHIEVE AN ULTRA SMOOTH SEALING SURFACE FOR THE INNER JACKET GLAND SEAL LOCATED APPROXIMATELY 3" TO 6" FORWARD OF THE OUTER JACKET EDGE. WHEN SANDING, SAND INNER JACKET RADially AROUND PERPENDICULAR TO ITS AXIS. USE FINE GRIT SAND PAPER (~400 GRIT). FINISH BY POLISHING SURFACES WITH NYLON TIE WRAPS OR BACK OF THE SAND PAPER. CLEAN WITH ALCOHOL.

OPERATOR INITIALS: _____ DATE: _____

16. USING THE TERMINATION CONE CAP AS A GAGE, CUT THE SOLDER POTS OFF THE KEMLON FEED-THRU SO IT DOES NOT SIT ABOVE EITHER SIDE OF THE TERMINATION CONE CAP WHEN INSTALLED.

OPERATOR INITIALS: _____ DATE: _____

17. CLEAN AND LIGHTLY LUBRICATE THE O-RING ON THE KEMLON FEED-THRU. INSTALL THE KEMLON FEED-THRU INTO THE TERMINATION CONE CAP. ENSURE THAT IS DOES NOT SIT ABOVE EITHER SIDE OF THE TERMINATION CONE CAP.

OPERATOR INITIALS: _____ DATE: _____

18. CLEAN AND LIGHTLY LUBRICATE THE 2-149 O-RING AND ITS GROOVE ON THE TERMINATION CONE CAP. INSTALL THE O-RING.

OPERATOR INITIALS: _____ DATE: _____

19. MAKE A MARK ON THE INNER JACKET APPROXIMATELY 5-5/8" FORWARD OF THE OUTER JACKET EDGE. CAREFULLY REMOVE THE INNER JACKET UP TO THE MARK.

OPERATOR INITIALS: _____ DATE: _____

20. VERIFY THE INTEGRITY OF THE CONDUCTOR JACKETS PER STANDARD ODI PROCEDURE 34137 (SOP-066-39) FIELD VERIFICATION TEST OF CABLE BREAKOUT INSULATION INTEGRITY.

OPERATOR INITIALS: _____ DATE: _____

21. REMOVE THE FIBER TUBE JACKETS APPROXIMATELY 1/2" FORWARD OF THE INNER JACKET EDGE.

OPERATOR INITIALS: _____ DATE: _____

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22. CLEAN AND LIGHTLY SAND THE CONDUCTOR JACKETS AND FIBER TUBES AS REQUIRED TO ACHIEVE ULTRA SMOOTH SEALING SURFACES FOR THE CONDUCTOR AND TUBE GLAND AND BOOT SEALS LOCATED APPROXIMATELY 1" TO 4" FORWARD OF THE INNER JACKET EDGE. WHEN SANDING, SAND JACKETS/TUBES RADially AROUND PERPENDICULAR TO THEIR AXES. USE FINE GRIT SAND PAPER (~400 GRIT). FINISH BY POLISHING SURFACES WITH NYLON TIE WRAPS OR BACK OF THE SAND PAPER. CLEAN WITH ALCOHOL.

OPERATOR INITIALS: _____ DATE: _____

23. SPRAY AN EVEN COAT OF TIOLON X20 INSIDE THE TERMINATION CONE WHERE THE SOCKETFAST BLUE WILL BE IN CONTACT. ALLOW TO DRY PER MANUFACTURER'S INSTRUCTIONS.

OPERATOR INITIALS: _____ DATE: _____

24. SLIDE THE TERMINATION CONE FORWARD UNTIL THE BACK EDGE IS ALIGNED WITH THE MARK ON THE CABLE OUTER JACKET.

OPERATOR INITIALS: _____ DATE: _____

25. CLEAN AND LIGHTLY LUBRICATE THE DORN CABLE FITTING RUBBER PACKING THEN SLIDE FORWARD WITH WASHERS AND SEAT WITHIN THE TERMINATION CONE. INSTALL DORN FITTING COMPRESSION PLATE USING ASSOCIATED FASTENERS TO SEAT THE FITTING COMPLETELY WITHIN THE TERMINATION CONE.

OPERATOR INITIALS: _____ DATE: _____

26. ORIENT ASSEMBLY VERTICALLY IN PREPARATION FOR POTTING.

OPERATOR INITIALS: _____ DATE: _____

27. "FAN" OUT THE KEVLAR IN PREPARATION FOR POTTING.

OPERATOR INITIALS: _____ DATE: _____

28. POT KEVLAR REINFORCEMENT USING SOCKETFAST BLUE. OVERFILL WITH SOCKETFAST BLUE APPROXIMATELY 1/16" TO ALLOW FOR PRELOADING USING THE TERMINATION CONE CAP. USE THE TERMINATION CONE CAP AS A GAGE TO DETERMINE THE PROPER FILL HEIGHT.

OPERATOR INITIALS: _____ DATE: _____

29. ALLOW SOCKETFAST BLUE TO CURE THEN INSTALL THE TERMINATION CONE CAP.

OPERATOR INITIALS: _____ DATE: _____

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30. APPLY LOCTITE 222 TO THE FIRST 3-4 THREADS OF THE 10-32 CAP SCREWS. INSTALL AND TORQUE INCREMENTALLY TIL SNUG. ENSURE TERMINATION CONE CAP BOTTOMS WITHIN THE TERMINATION CONE.

OPERATOR INITIALS: _____ DATE: _____

31. CLEAN AND LIGHTLY LUBRICATE THE I.D. AND O.D. OF THE INNER JACKET GLAND SEAL. CAREFULLY SLIDE THE GLAND SEAL OVER THE CABLE AND SEAT WITHIN THE TERMINATION CONE CAP. ENSURE THE GLAND SEAL IS NOT DAMAGED DURING INSTALLATION BY REMOVING ANY SHARP EDGES FROM THE CABLE JACKET. ALTERNATIVELY, TEMPORARILY INSTALL PROTECTIVE TUBING OVER THE CABLE TO PREVENT GLAND SEAL DAMAGE. SLIDE THE BACKUP WASHER OVER THE CABLE AND SEAT WITHIN THE TERMINATION CONE CAP.

OPERATOR INITIALS: _____ DATE: _____

32. FIT BOTH HALVES OF THE CABLE GRIP OVER THE CABLE SO THEY ARE IN CONTACT WITH THE TERMINATION CONE CAP.

OPERATOR INITIALS: _____ DATE: _____

33. CLEAN AND LIGHTLY LUBRICATE ONE 2-345 O-RING AND THE LOWER GROOVE ON THE POTTING HOUSING. INSTALL O-RING.

OPERATOR INITIALS: _____ DATE: _____

34. FEED THE CONDUCTORS AND FIBER TUBES THRU THE POTTING HOUSING. SEAT THE POTTING HOUSING WITHIN THE TERMINATION CONE WHILE ALIGNING THE THRU HOLES WITH THE TAPPED HOLES.

OPERATOR INITIALS: _____ DATE: _____

35. USE THE 10-32 X 1-1/4" CAP SCREWS TO START SEATING THE POTTING HOUSING AND CABLE GRIP. AFTER THE 10-32 X 1-1/4" SCREWS HAVE BOTTOMED OUT, REMOVE THEM ONE AT A TIME AND APPLY LOCTITE 222 TO THE FIRST 3-4 THREADS OF THE 10-32 X 1" CAP SCREWS THEN INSTALL. TORQUE THE 10-32 X 1" CAP SCREWS INCREMENTALLY TIL SNUG. TRY TO KEEP THE GAPS BETWEEN THE CABLE GRIP HALVES EVEN. ENSURE POTTING HOUSING BOTTOMS WITHIN THE TERMINATION CONE.

OPERATOR INITIALS: _____ DATE: _____

36. PROTECT THE HEX SOCKETS OF THE 10-32 X 1" CAP SCREWS BY FILLING WITH A SUITABLE PUTTY. THIS WILL ENABLE THE SCREWS TO BE REMOVED IN CASE RE-TERMINATION IS REQUIRED

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37. BEND/FORM THE CONDUCTORS AND FIBER TUBES SO THEY HAVE STRAIGHT ENTRY INTO THE GLAND SEAL HOUSING. WHEN BENDING/FORMING CONDUCTORS, CONSIDER THE ALIGNMENT OF THE GLAND SEAL HOUSING SET SCREW COUNTERBORES INCLUDING THE PROTECTIVE SLEEVES. TEST FIT THE SEPARATOR PLATE AND GLAND SEAL HOUSING.

OPERATOR INITIALS: _____ DATE: _____

38. ORIENT THE CABLE VERTICALLY IN PREPARATION FOR POTTING CABLE BREAKOUT.

OPERATOR INITIALS: _____ DATE: _____

39. PREPARE THE SCOTCHCAST POTTING COMPOUND PER D/N 31321 (SOP-064-39) AND POT THE CABLE IN ACCORDANCE WITH STANDARD ODI PRACTICE. POT THE ASSEMBLY IN TWO POURS, APPROXIMATELY $\frac{1}{4}$ OF THE VOLUME THE FIRST POUR WITH THE SECOND POUR TO FILL TO THE TOP OF THE POTTING HOUSING MINOR DIAMETER BORE. AGITATE POTTING COMPOUND WHILE FILLING TO ALLOW TRAPPED AIR BUBBLES TO RISE. FILL ANY REMAINING POCKETS AFTER CURING. ALLOW POTTING TO SET AFTER EACH POUR. ENSURE THERE ARE NO REMAINING POCKETS AT THE TOP OF THE POTTING. DO NOT ALLOW THE POTTING TO EXTEND PASSED THE TOP OF THE POTTING HOUSING MINOR DIAMETER BORE.

CAUTION: ENSURE NO VOIDS REMAIN IN THE POTTING AS THIS WILL ALLOW THE CONDUCTORS TO PUSH BACK INTO THE VOIDS AND POSSIBLY LEAD TO INSULATION OR SEAL FAILURE.

OPERATOR INITIALS: _____ DATE: _____

40. PRIOR TO POTTING COMPOUND SETTING, INSTALL SEPARATOR PLATE AND BACKUP WASHERS OVER THEIR APPROPRIATE CABLE ELEMENTS. CLEAN AWAY EXCESS POTTING COMPOUND AS REQUIRED.

OPERATOR INITIALS: _____ DATE: _____

41. ALLOW POTTING COMPOUND TO CURE.

OPERATOR INITIALS: _____ DATE: _____

42. CLEAN AND LIGHTLY LUBRICATE THE O.D. AND I.D. OF THE CONDUCTOR AND FIBER TUBE GLAND SEALS THEN SLIDE THEM OVER THE APPROPRIATE WIRES AND FIBER TUBES. ENSURE THE GLAND SEALS ARE NOT DAMAGED DURING INSTALLATION BY REMOVING ANY SHARP EDGES FROM THE JACKETS. ALTERNATIVELY, TEMPORARILY INSTALL PROTECTIVE TUBING OVER THE WIRES AND FIBER TUBES TO PREVENT GLAND SEAL DAMAGE.

OPERATOR INITIALS: _____ DATE: _____

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SUBJECT: MBARI MOOS MOORING BOUY CABLE
TERMINATION, D/N 61040 (OPM-222-01)
& D/N 61041 (OPM-223-01) FIELD
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43. CLEAN AND LIGHTLY LUBRICATE THE 2-137 O-RINGS AND THEIR GROOVES IN THE GLAND SEAL HOUSING. INSTALL O-RINGS.

OPERATOR INITIALS: _____ DATE: _____

44. FEED THE CONDUCTORS AND FIBER TUBES THROUGH THE APPROPRIATE PASSAGES IN THE GLAND SEAL HOUSING WHILE ALIGNING THE TAPPED HOLES WITH THE SET SCREW SEATS, SLIDE THE HOUSING BACK THEN SEAT THE GLAND SEALS WITHIN THE GLAND SEAL HOUSING. INSURE THE GLAND SEALS ARE NOT DAMAGED.

OPERATOR INITIALS: _____ DATE: _____

45. SEAT THE GLAND SEAL HOUSING WITHIN THE POTTING HOUSING. IF EXCESSIVE RESISTANCE IS FELT, BACK OFF AND INVESTIGATE TO INSURE THE GLAND SEALS ARE NOT DAMAGED.

OPERATOR INITIALS: _____ DATE: _____

46. APPLY LOCTITE 425 TO THE FIRST 3-4 THREADS OF THE 10-32 SET SCREWS AND INSTALL INTO POTTING HOUSING. TORQUE TIL SNUG.

OPERATOR INITIALS: _____ DATE: _____

47. CLEAN AND LIGHTLY LUBRICATE THE 5-124 O-RINGS AND THEIR SEATS THE **TITANIUM** SEAL SCREWS. INSTALL THE O-RINGS.

OPERATOR INITIALS: _____ DATE: _____

48. INSTALL THE SEAL SCREWS INTO THE GLAND SEAL HOUSING. TORQUE TIL SNUG.

OPERATOR INITIALS: _____ DATE: _____

49. CLEAN AND LIGHTLY LUBRICATE THE WIRES AND FIBER ELEMENTS TO FACILITATE INSTALLATION OF THE JACKET BOOT SEALS. INSTALL THE BOOT SEALS OVER THE APPROPRIATE CONDUCTORS AND FIBER ELEMENTS. ENSURE THEY ARE FULLY SEATED AND EXCESS LUBRICANT OR AIR IS BURPED OUT.

OPERATOR INITIALS: _____ DATE: _____

50. FEED THE FIBER TUBES THRU THE FIRST TWO PROTECTIVE SLEEVES AND SEAT THEM WITHIN THE GLAND SEAL HOUSING. ALIGN THE SET SCREW SEATS WITH THE TAPPED HOLES. APPLY LOCTITE 425 TO THE FIRST 3-THREADS OF THE 8-32 SET SCREWS AND INSTALL WITHIN THE GLAND SEAL HOUSING TO SECURE THE PROTECTIVE SLEEVES. TORQUE SCREWS TIL SNUG.

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51. CUT FIBER TUBES TO LENGTH SO THEY EXTEND APPROXIMATELY 7/8" ABOVE THE TOP OF THE PROTECTIVE SLEEVES. USE THE TUBING SEAL PARTS AS A GUIDE FOR CUTTING THE FIBER TUBES TO LENGTH. THE TUBE SEALS ARE TO BE AS CLOSE TO THE PROTECTIVE SLEEVES AS POSSIBLE. USE A FILE TO SCORE THE FIBER TUBE AND CAREFULLY BREAK TUBE SO FIBERS ARE NOT DAMAGED. DEBURR AND CLEAN THE ENDS OF THE TUBES.

OPERATOR INITIALS: _____ DATE: _____

52. THOROUGHLY CLEAN ALL FIBERS WITH ALCOHOL AND LINT FREE TISSUE.

OPERATOR INITIALS: _____ DATE: _____

53. CLEAN ALL TUBING SEAL PARTS MATING SURFACES WITH ALCOHOL AND SWAB.

OPERATOR INITIALS: _____ DATE: _____

54. CAREFULLY LIGHTLY LUBRICATE THE O-RING GROOVES ON THE FEED-THRU SEALS AND INSTALL 5-124 O-RINGS SO AS NOT TO CONTAMINATE SURFACES OF SEALS TO BE EPOXIED.

OPERATOR INITIALS: _____ DATE: _____

55. INSERT THE FEED-THRU SEALS INTO THEIR SEAL BODIES UNTIL THEY ARE FULLY SEATED.

OPERATOR INITIALS: _____ DATE: _____

56. INSTALL THE RETAINER NUTS ONTO THE SEAL BODIES. TORQUE TIL SNUG.

OPERATOR INITIALS: _____ DATE: _____

57. SLIDE THE TUBING-GLAND NUTS, JAM BUSHINGS, AND GRIP BUSHINGS OVER FIBERS AND ONTO THE ENDS OF THE TUBES.

OPERATOR INITIALS: _____ DATE: _____

58. SLIDE THE SEAL BODY ASSEMBLIES OVER THE FIBERS AND ONTO THE TUBES.

OPERATOR INITIALS: _____ DATE: _____

59. SEAT THE GRIP BUSHINGS BETWEEN THE TUBES AND SEAL BODIES. MOVE THE JAM BUSHINGS AND GLAND NUTS TO THE BODY OF THE SEALS. TIGHTEN ¼ TURN PAST HAND TIGHT.

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60. PREPARE THE EPOXY INCLUDED IN THE FITA KIT PER MANUFACTURER INSTRUCTIONS.

OPERATOR INITIALS: _____ DATE: _____

61. CENTRIFUGE THE EPOXY AT 3400 RPM FOR 3 MINUTES IN A SYRINGE.

OPERATOR INITIALS: _____ DATE: _____

62. TAKING CARE NOT TO STRESS THE TUBE SEALS, ORIENT THE CABLE AND TERMINATION VERTICALLY WITH THE FIBER UP.

OPERATOR INITIALS: _____ DATE: _____

63. CAREFULLY INJECT THE EPOXY INTO THE FEED-THRU SEALS STARTING AT THE BOTTOM AND FILLING UPWARD UNTIL FULL. CAREFULLY SPREAD FIBERS OUT TO ALLOW FOR SUFFICIENT EPOXY TO FIBER COVERAGE.

OPERATOR INITIALS: _____ DATE: _____

64. INSTALL THE HEATING FIXTURE ONTO THE SEAL BODIES.

OPERATOR INITIALS: _____ DATE: _____

65. APPLY HEAT TO THE HEATING FIXTURE TO THE SCHEDULE PROVIDED BY THE MANUFACTURER (65°C FOR 2 HRS). ALLOW THE EPOXY TO CURE AS SPECIFIED BY THE MANUFACTURER.

OPERATOR INITIALS: _____ DATE: _____

66. REMOVE THE HEATING FIXTURE FROM THE SEAL BODIES AND INSTALL THE FRONT SWAGE NUTS.

OPERATOR INITIALS: _____ DATE: _____

67. INSTALL SPACERS BEHIND TUBE SEAL ASSEMBLIES TO FILL THE GAP BETWEEN THEM AND THE PROTECTIVE SLEEVES.

OPERATOR INITIALS: _____ DATE: _____

68. FEED THE FIBERS THRU THE SECOND SET OF PROTECTIVE SLEEVES AND SEAT THEM OVER THE FIRST SET OF PROTECTIVE SLEEVES. ALIGN THE SET SCREW SEATS WITH THE TAPPED HOLES. APPLY LOCTITE 425 TO THE FIRST 3-4 THREADS OF THE 8-32 SET SCREWS AND INSTALL WITHIN THE GLAND SEAL HOUSING TO SECURE THE PROTECTIVE SLEEVES. TORQUE SCREWS TIL SNUG.

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69. CLEAN AND LIGHTLY LUBRICATE THE REMAINING 2-345 O-RING AND THE UPPER GROOVE ON THE POTTING HOUSING. INSTALL O-RING.

OPERATOR INITIALS: _____ DATE: _____

70. APPLY LOCTITE 222 TO THE FIRST 3-4 THREADS OF THE STAND OFF RODS THEN INSTALL TO THE POTTING HOUSING. TORQUE TILL SNUG.

OPERATOR INITIALS: _____ DATE: _____

71. CLEAN AND LIGHTLY LUBRICATE THE 2-340 O-RING AND ITS GROOVE ON THE END CAP. INSTALL O-RING.

OPERATOR INITIALS: _____ DATE: _____

72. AS APPLICABLE, CLEAN AND LIGHTLY LUBRICATE THE 3-912 O-RING AND ITS ASSOCIATED SEAT ON THE ODI HOSE ASSEMBLY. INSTALL O-RING ONTO THE BOSS SEAT.

OPERATOR INITIALS: _____ DATE: _____

73. AS APPLICABLE, FEED WIRES/FIBERS FROM THE HOSE ASSEMBLY THROUGH THE PORT IN THE END CAP.

OPERATOR INITIALS: _____ DATE: _____

74. AS APPLICABLE, APPLY LOCTITE 290 TO THE FIRST 2-3 THREADS, INSTALL AND TORQUE THE BOSS FITTING TIL SNUG.

OPERATOR INITIALS: _____ DATE: _____

75. FOR THE LOWER TERMINATION, CLEAN AND LIGHTHLY LUBRICATE THE O-RING AND ITS SEAT ON THE CUSTOMER SUPPLIED SEACON PENETRATOR. INSTALL O-RING. APPLY LOCTITE 290 TO THE FIRST 3-4 THREADS OF THE PENETRATOR. CAREFULLY FEED THE WIRES THRU THE END CAP AND INSTALL THE PENETRATOR. TORQUE TIL SNUG ENSURING IT IS COMPLETELY SEATED.

OPERATOR INITIALS: _____ DATE: _____

76. FOR THE UPPER TERMINATION, CLEAN AND LIGHTHLY LUBRICATE THE 2-125 O-RING AND ITS SEAT ON THE CUSTOMER SUPPLIED PENETRATOR. INSTALL O-RING. CAREFULLY FEED THE WIRES AND FIBERS THRU THE END CAP AND INSTALL THE PENETRATOR WHILE ALIGNING THE FIXING HOLES. APPLY LOCTITE 222 TO THE FIRST 3-4 THREADS OF THE ¼-28 SCREWS. TORQUE SCREWS TIL SNUG.

OPERATOR INITIALS: _____ DATE: _____

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77. INSTALL END CAPS ONTO THE STAND OFF RODS THEN APPLY LOCTITE 222 TO THE FIRST THREE TO FOUR THREADS OF THE 8-32 SET SCREWS. INSTALL SET SCREWS AND TORQUE TIL SNUG.

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78. TRIM THE WIRES TO THE PROPER LENGTH FOR TERMINATION. LOOP WIRES AS REQUIRED.

OPERATOR INITIALS: _____ DATE: _____

79. CLEAN AND LIGHTLY LUBRICATE THE WIRES FROM THE HOSE ASSEMBLY AND PENETRATORS, THEN SLIDE THE APPROPRIATE SPLICE BOOT SEALS OVER THE WIRES AND BACK APPROXIMATELY 1 INCH.

OPERATOR INITIALS: _____ DATE: _____

80. SPLICE THE WIRES USING THE APPROPRIATE SPLICE SOLDER POTS IN ACCORDANCE WITH D/N 10555 (MAN-22.0) AND THE CUSTOMER APPROVED WIRING DIAGRAM.

OPERATOR INITIALS: _____ DATE: _____

81. SLIDE THE SPLICE BOOT SEALS INTO POSITION AND ENSURE THEY ARE FULLY SEATED. BURP OUT EXCESS LUBRICANT AND AIR.

OPERATOR INITIALS: _____ DATE: _____

82. CLEAN AND LIGHTLY LUBRICATE THE FREE WIRES THEN INSTALL BOOT CAPS.

OPERATOR INITIALS: _____ DATE: _____

83. FOR THE UPPER TERMINATION, PERFORM BOOT SEAL INTEGRITY TEST BY SUBMERGING EACH SPLICE BOOT SEAL IN A WATER BATH AND MEASURING I/R AT 500 VDC FROM THE BATH TO THE CONDUCTOR.

OPERATOR INITIALS: _____ DATE: _____

84. MANAGE WIRES INTO THE VOLUME OF THE TERMINATION TAKING CARE TO LEAVE PLENTY OF ROOM FOR FIBER SPLICING. TIE WRAP AS REQUIRED BE SURE THAT THE WIRES ARE SECURED.

OPERATOR INITIALS: _____ DATE: _____

85. CUT FIBERS TO SUITABLE LENGTHS FOR SPLICING THEN SLIDE AN OPTICAL SPLICE OVER EACH OF THE PAIRED FIBERS TO BE SPLICED. TAKE CARE NOT TO DAMAGE THE FIBERS.

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86. USING AN OPTICAL SPLICE TOOL, SPLICE THE FIBERS TOGETHER IN ACCORDANCE WITH THE WIRING DIAGRAM ON ASSEMBLY DRAWING. RECORD THE RESULTS OF OPTICAL LOSS AT 1310 nm ON D/N 55115 (ATP-050-40).

OPERATOR INITIALS: _____ DATE: _____

87. HEAT SHRINK SPLICE COVERS OVER SPLICES.

OPERATOR INITIALS: _____ DATE: _____

88. COIL FIBERS INTO THE VOLUME OF THE TERMINATION TAKING CARE TO ENSURE THAT THE BEND RADIUS DOES NOT BECOME LESS THAN 1". TIE WRAP IN CONJUNCTION WITH FOAM PADS TO ENSURE THE FIBERS ARE SECURED WITHOUT INTRODUCING PINCH POINTS.

OPERATOR INITIALS: _____ DATE: _____

89. ORIENT THE SPLICE TUBE COVER IN PREPARATION FOR INSTALLATION. FEED CABLES AND/OR HOSE THRU SPLICE TUBE COVER AND INSTALL WHILE ALIGNING FLANGE THRU HOLES.

OPERATOR INITIALS: _____ DATE: _____

90. BOLT THE SPLICE TUBE COVER TO THE TERMINATION CONE USING THE CUSTOMER SUPPLIED 5/8-11 BOLTS, NUTS, FLAT WASHERS, AND LOCK WASHERS.

OPERATOR INITIALS: _____ DATE: _____

91. FOR THE LOWER TERMINATION, CLEAN AND LIGHTLY LUBRICATE THE 3-904 O-RING AND INSTALL ONTO THE FILL/VENT PLUG. INSTALL FILL/VENT PLUG INTO SPLICE TUBE COVER. TORQUE TILL SNUG.

OPERATOR INITIALS: _____ DATE: _____

92. FOR THE LOWER TERMINATION, POSITION THE ASSEMBLY VERTICALLY WITH THE END CAP FACING UP.

OPERATOR INITIALS: _____ DATE: _____

93. FOR THE LOWER TERMINATION, FILL THE TERMINATION ASSEMBLY WITH CLEAN WATER UNTIL THE SOLDER SPLICE BOOT SEALS ARE COMPLETELY SUBMERGED.

NOTE: AT NO TIME SHOULD ANY WATER BE ALLOWED TO ENTER THE HOSE ASSEMBLY.

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94. FOR THE LOWER TERMINATION, MEASURE CONTINUITY, INSULATION RESISTANCE AT 500 VDC FROM CIRCUIT TO CIRCUIT AND EACH CIRCUIT TO GROUND, AND OPTICAL INSERTION LOSS AT 1310 nm. RECORD RESULTS ON D/N 55115 (ATP-050-40). CONTINUITY PASSING IS ≤ 0.2 OHM OVER PREVIOUSLY MEASURED VALUE. INSULATION RESISTANCE PASSING IS ≥ 1 GIGOHM. OPTICAL INSERTION LOSS PASSING IS ≤ 0.5 dB PER MATCHED PAIR OR ≤ 0.75 dB PER UNMATCHED PAIR PLUS 0.1 dB PER SPLICE ABOVE LOSS ASSOCIATED WITH CABLE SEGMENT MEASURED EARLIER.

OPERATOR INITIALS: _____ DATE: _____

95. FOR THE LOWER TERMINATION, REMOVE THE FILL/VENT PLUG AND ALLOW THE WATER TO DRAIN. REMOVE THE SPLICE TUBE COVER AND THOROUGHLY DRY THE TERMINATION USING DRY NITROGEN OR HELIUM.

OPERATOR INITIALS: _____ DATE: _____

96. FOR THE LOWER TERMINATION, AFTER DRYING, INSTALL THE SPLICE TUBE COVER AS DESCRIBED IN PREVIOUS STEPS.

OPERATOR INITIALS: _____ DATE: _____

97. FOR THE LOWER TERMINATION, USING TEFLON THREAD SEALANT TAPE, INSTALL THE CHECK VALVE INTO THE MODIFIED FITTING. CLEAN AND LIGHTLY LUBRICATE THE 3-904 O-RING AND INSTALL ONTO THE MODIFIED FITTING. INSTALL THE ASSEMBLY INTO THE SPLICE TUBE COVER. TORQUE TIL SNUG. INSTALL THE PROTECTIVE CAP ON THE CHECK VALVE.

OPERATOR INITIALS: _____ DATE: _____

98. FOR THE LOWER TERMINATION, TEST USING HELIUM OR DRY NITROGEN PER D/N 55115 (ATP-050-40). RECORD RESULTS ON THE LOG SHEET.

OPERATOR INITIALS: _____ DATE: _____

99. AFTER PASSING THE HELIUM TEST, BACK OFF THE 5/8-11 NUTS ON THE UPPER AND LOWER TERMINATIONS ONE AT A TIME AND APPLY LOCTITE 290 TO THE THREADS WHERE THE NUTS WILL REST. RETIGHTEN NUTS ENSURING SPLICE TUBE COVER IS FULLY SEATED.

OPERATOR INITIALS: _____ DATE: _____

100. FOR THE LOWER TERMINATION, PLACE THE ASSEMBLY WITH THE FILL/VENT PLUG VERTICALLY FACE UP. REMOVE THE FILL/VENT PLUG AND SLOWLY POUR SILICONE FLUID INTO THE TERMINATION. ROTATE THE ASSEMBLY OCCASIONALLY TO ALLOW TRAPPED AIR TO ESCAPE UNTIL THE TERMINATION IS FULL AND NO MORE AIR BUBBLES CAN BE SEEN.

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101. FOR THE LOWER TERMINATION, ELEVATE THE CONNECTOR END HIGHER THAN THE TERMINATION ASSEMBLY ON A CONSTANT SLOPE. REMOVE THE FILL/VENT PLUG FROM THE CONNECTOR AND ALTERNATELY INJECT AND WITHDAW SILICONE OIL INTO THE CONNECTOR FILL PORT USING A SYRINGE UNTIL NO AIR REMAINS WITHIN THE ASSEMBLY. REPLACE THE FILL/VENT PLUG AND TORQUE TILL SNUG.

OPERATOR INITIALS: _____ DATE: _____

102. INSTALL THE CUSTOMER SUPPLIED BEND RESTRICTOR. APPLY LOCTITE 222 TO ALL FASTENERS AND TORQUE TIL SNUG.

OPERATOR INITIALS: _____ DATE: _____

103. MEASURE CONTINUITY, INSULATION RESISTANCE AT 500 VDC FROM CIRCUIT TO CIRCUIT AND EACH CIRCUIT TO GROUND, AND OPTICAL INSERTION LOSS AT 1310 nm PER D/N 55115 (ATP-050-40). RECORD RESULTS ON LOG SHEET. CONTINUITY PASSING IS ≤ 0.2 OHM OVER PREVIOUSLY MEASURED VALUE. INSULATION RESISTANCE PASSING IS ≥ 1 GIGOHM. OPTICAL INSERTION LOSS PASSING IS ≤ 0.5 dB PER MATCHED PAIR OR ≤ 0.75 dB PER UNMATCHED PAIR PLUS 0.1 dB PER SPLICE ABOVE LOSS ASSOCIATED WITH CABLE SEGMENT MEASURED EARLIER.

OPERATOR INITIALS: _____ DATE: _____

104. PERFORM ANY CUSTOMER REQUIRED TESTING AT THIS TIME. RECORD TEST PERFORMED AND OBSERVATIONS ON D/N 55115 (ATP-050-40).

OPERATOR INITIALS: _____ DATE: _____

105. IF REQUESTED, ASSIST THE CUSTOMER WITH FURTHER ASSEMBLY, INTEGRATION OR TESTING. RECORD A BRIEF DESCRIPTION OF ADDITIONAL WORK THAT IS PERFORMED.

OPERATOR INITIALS: _____ DATE: _____