EMERGENCY ELASTOMER INJECTION SYSTEM FOR USE ON E-LINE AND BRAIDED CABLE

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates in general to mineral recovery wells, and in particular to an apparatus and method for sealing a wellbore.

2. Brief Description of Related Art

[0002] Wire line operations in a wellbore typically use one of three types of wire line – slick line, e-line, or braided cable. In order to maintain pressure control during these operations, and thus prevent pressurized fluid escaping from the wellbore, the wire line is passed through a pressure controlling device. Devices for preventing pressure from escaping from the well bore include wire line blowout preventers ("BOP"), pressure control heads ("PCH"), lower riser packages ("LRP"), and lubricators.

[0003] These pressure control devices employ different methods of pressure control including rams, pressure energized packing sets, and grease. These methods, although different, follow the same principals in that they all form a seal around the outside of the wire line. It therefore follows that the outer profile and indeed construction of the wire line can significantly alter the effectiveness of the seal generated. For example, on braided cable, the structure is such that it has a labyrinth of leak paths so even with tight sealing on the outer diameter, leakage is possible through the gaps which exist in the structure of the cable itself. In some cases grease is injected into the cable, under high pressure, to fill the void, thus reducing the ingress and leakage of

wellbore fluids through the cable. Unfortunately, the grease will follow the same principle of leakage through the labyrinth and ultimately be depleted over the duration of the operation. The grease must be replenished to maintain the seal for a length of time. Therefore, it is desirable to have a semi-permanent seal for use in emergency situations.

SUMMARY OF THE INVENTION

[0004] Embodiments of the claimed invention relate primarily to sealing in an emergency. Because e-line and braided cable can have a labyrinth of leak paths, conventional sealing techniques require constant grease injection in order to maintain a seal. Under certain circumstances, such as an emergency condition, the seal around the wire line may be required to maintain pressure control for a significant length of time. The grease supply will therefore deplete and may be not be replenished or maintain enough pressure to seal. Embodiments of the claimed invention can include a cylinder of sealant, such as an elastomer, epoxy, or some other plastic, any of which can be stored in a liquid or paste form. In some embodiments, the sealant can include particles of predetermined sizes. The sealant can be stored in a two- part resin form, where it can remain in a fluid state for a long period of time. Upon actuation of an emergency sequence, an injection module would deploy the pressurized sealant to a pre-defined chamber in a wellbore member via one or several ports. Upon injection, it would begin to chemically change and increase in viscosity until it is set, ultimately forming a seal within the labyrinth of the e-line or braided cable.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] So that the manner in which the features, advantages and objects of the invention, as well as others which will become apparent, are attained and can be understood in more detail, more particular description of the invention briefly summarized above may be had by reference to the embodiment thereof which is illustrated in the appended drawings, which drawings form a part of this specification. It is to be noted, however, that the drawings illustrate only a preferred embodiment of the invention and is therefore not to be considered limiting of its scope as the invention may admit to other equally effective embodiments.

[0006] Figure 1 is a partial side view of an embodiment of a pressure control head with an injection module according to an embodiment of the present invention.

[0007] Figure 2 is a partial side view of the embodiment of Figure 1, showing the pressure control head in a pressurized position.

[0008] Figure 3 is a partial side view of the embodiment of Figure 1, showing the pressure control head in a pressurized position and the cable sealing apparatus having injected sealant into the cable.

[0009] Figure 4 is a cross section of an exemplary embodiment of cable.

[0010] Figure 5 is a cross section of another exemplary embodiment of cable.

[0011] Figure 6 is a partial side view of a cable having sealant injected into it according to an embodiment of the present invention.

[0012] Figure 7 is a partial sectional side view of an injection module and a lower riser package according to an embodiment of the present invention.

[0013] Figure 8 is a partial sectional side view of an injection module and a blowout preventer according to an embodiment of the present invention.

[0014] Figure 9 is a partial sectional side view of an injection module positioned within a remotely operated vehicle, and a blowout preventer according to an embodiment of the present invention.

[0015] Figure 10 is a partial sectional side view of an injection module and a lubricator according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] The present invention will now be described more fully hereinafter with reference to the accompanying drawings which illustrate embodiments of the invention. This invention may, however, be embodied in many different forms and should not be construed as limited to the illustrated embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout, and the prime notation, if used, indicates similar elements in alternative embodiments.

[0017] Referring to Figure 1, cable 100 is a flexible cable suspended through pressure control head ("PCH") 102 into a wellbore (not shown). Cable 100, which has a small diameter relative to the wellbore, can be used to lower a wireline-run tool into a wellbore. PCH 102 can be used to form a seal against cable 100 so that pressure from the wellbore is not released around cable 100 during wireline operations. Bore 104 is an axial passage through PCH 102. In some embodiments, bore 104 is sufficiently large inner diameter ("ID") that a wireline-run tool can pass through PCH 102. In other embodiments, cable 100 can be run through PCH 102 prior to attaching the wireline-run tool.

[0018] As best shown in Figures 4 and 5, cable 100 can be a braided cable having individual strands 106 of wire or other fibers. Strands 106 can be twisted or woven together to provide a cable with sufficient tensile strength and flexibility to lower a wireline-run tool into the wellbore. Even with a tight twisting or braiding of strands 106, however, gaps 108 can exist between strands 106. Cable 100 can also have an uneven outer profile, or outer surface, because of the gaps 108 around its outer diameter. Because strands 106 generally run in the axial direction, gaps 108 can form a labyrinth of leak paths through which fluid can travel. As shown in Figure

4, a cable 100 having relatively large diameter wires or strands 106 can have large gaps 108. As shown in Figure 5, a cable 100' having a larger number of small diameter strands 106' can have a smaller gaps 108', albeit a larger number of them. Cable 100 can be an electric line, or "e-line," wherein one or more of the strands 106 are insulated electrical conductors. In some embodiments, the outer diameter of cable 100 can have a protective or insulated sheath 110. Sheath 110 can be a braided sleeve around, for example, individually insulated wires. A leak path can exist for fluid to pass through sheath 110 and then along the individual wires.

[0019] Upper lubricator 112 and lower lubricator 114 can be used to form a seal against cable 100. As one of skill in the art will appreciate, lubricators 112 and 114, which can be conventional, can include fingers for imparting grease to cable 100 as cable 100 moves through PCH 102. The grease can fill gaps 108 within cable 100 and along the outer diameter of cable 100. Lubricators 112 and 114 can form a seal against cable 100 during routine operations.

[0020] During a high pressure condition in the wellbore, the seal between cable 100 and lubricators 112, 114 may be inadequate. A restrictor, such as pressure energized packing sets 116, can be used to establish a more robust seal around cable 100. In one embodiment, packing sets 116 can include chamber 118, connected to pressure port 120. Sealing face 122 is the inner diameter wall of chamber 118 and, thus, faces radially inward toward the axis of bore 104. As best shown in Figure 2, when pressure, such as pneumatic or hydraulic pressure, is applied through pressure port 120, chamber 118 expands to cause sealing face 120 to move radially inward toward the center of bore 104 to occupy the annular space of bore 104. As chamber 118 expands so that sealing face 122 presses against an outer diameter of cable 100 to limit the flow of wellbore fluid through bore 104. As with conventional pressure control heads, the grease

imparted by lubricators 112, 114 can reduce the flow of wellbore fluid through gaps 108 between strands 106 of cable 100.

[0021] During a period of prolonged exposure to a high pressure condition, the grease imparted by packing sets 112 and 114 may be insufficient to maintain a seal. The high pressure can, over time, displace the grease from gaps 108, in which case wellbore fluid can flow around and through cable 100 and past packing set 116 to ultimately leak out of the wellbore. In some circumstances, such a prolonged high pressure condition can be an emergency condition.

[0022] An injection module 124 can be connected to PCH 102. Injection module 124 is used to inject a curable sealant 126 into an axial passage such as bore 104 so that sealant 126 contacts at least a portion of cable 100. In one embodiment, sealant 126 is injected into a portion of bore 104 that is located between two flow restrictors such as, for example, packing sets 116. In some embodiments, the sealant can be injected into other portions of the wellbore or riser, provided that sealant 126 contacts cable 100. The flow restrictors force the sealant to flow around and through cable 100. Without the flow restrictors, sealant 126 could flow freely out of bore 104 rather than being injected into gaps 108.

[0023] As shown in Figures 1-3, injection module 124 has an injection port 128, which is a tube or other fluid path from injection module 124 into bore 104. Injection port 128 is located between two flow restrictors such as, for example, packing sets 116. A one-way valve, such as check valve 130, can be used to prevent fluid in bore 104 from moving through injection port 128 into injection module 124. Injection module 124 can have a syringe type injector, wherein the sealant is initially stored in reservoir 132 and plunger 134 is actuated to force the sealant out of the reservoir and into bore 104. In the embodiment shown in Figures 1-3, reservoir 132 is a

part of the syringe injector. As best shown in Figure 3, reservoir 132 can hold a sufficient volume of sealant 126 to adequately fill bore 104 between packing sets 116 with enough sealant 126 to cause at least a portion of the sealant to contact the outer diameter of cable 100. In one embodiment, there is sufficient sealant 126 to cause at least a portion of the sealant to flow through gaps 108 in the vicinity of packing sets 116.

[0024] Plunger 134 can be actuated by any of a variety of techniques. For example, plunger 134 could be connected to a hydraulic piston and hydraulic pressure from the surface platform or from a remotely operated vehicle ("ROV") (not shown in Figures 1-3) can move the piston to actuate plunger 134. Alternatively, plunger 134 could have a lead screw and an electric motor could rotate the lead screw to actuate plunger 134. In another embodiment, an ROV can mechanically actuate injection module 124. For example, the rod 136 of plunger 134 can be accessible from outside of the wellbore member such as PCH 102, such that an ROV (not shown in Figures 1-3) can move the rod to actuate plunger 134. In one embodiment, injection module 124 is only actuated after the other sealing apparatus in the wellbore, such as PCH 102, blowout preventers (not shown in Figures 1-3), and various valves (not shown in Figures 1-3) are closed to seal the wellbore.

[0025] Sealant 126 can be any type of sealant for sealing gaps 108 or forming a seal between the outer diameter of cable 100 and the cable-facing surface of a restrictor, such as sealing face 120. Sealant 126 can be stored as a liquid or paste, and can remain in a fluid state for a long period of time. Sealant 126 can chemically change upon injection into bore 104 so that it begins to harden and increase in viscosity. In one embodiment, sealant 126 can be an elastomer that sets, or hardens, under a pre-determined condition. For example, the elastomer could set after reaching a certain temperature or pressure. In another embodiment, the elastomer could set upon being

exposed to a particular chemical. In the embodiment wherein the elastomer sets in response to reaching a certain pressure, the pressure can be selected so that bore 104 can be filled with the elastomer and the elastomer will set only after the pressure is sufficiently high to cause a portion of the elastomer to enter gaps 108 or enter the gap that may exist between cable 100 and sealing face 120. In one embodiment, sealant 126 can be a curable sealant that hardens after being injected, such as, for example, a curable polymer, a binary epoxy, or two-part resin, wherein the sealant is initially stored as two separate liquids. As shown in Figure 6, the two liquids can be mixed as they are injected into the bore, thus forming a sealant which will set in a predetermined amount of time or in response to predetermined conditions. In the embodiments described, the sealant can be a semi-permanent sealant such that removing the sealant, after it has set, requires a specific solvent or requires machining and re work of the cavity and bores.

[0026] In one embodiment, sealant 126 can include a fluid suspended particulate such that, upon injection, a portion of the particulate will lodge in flow restrictions such as gaps 108 or the annular space between cable 100 and sealing face 120. As shown in Figure 6, various sizes of particulate can be used to form seals within cable 138 by sealing gaps between strands 140. In one embodiment using at least two sizes of particulate, larger particulate 142 can fill large gaps 144 between strands 140, and then smaller particulate 146 can lodge between the larger particulate and the strands, and can fill small gaps 148, to form a tighter seal. A liquid sealant can then complete the seal, if needed, by adhering to the large and small particulate and the strands.

[0027] In one embodiment, as shown in Figure 7, injection module 150 can include more than one reservoir. For example, injection module 150 can include a first reservoir 152 containing a first fluid 154 and a second reservoir 156 containing a fluid 158. The fluids within the reservoirs

152, 156 can be injected by plungers 160 and 162, respectively. In one embodiment, the fluid can be contained in reservoirs 152, 156 by rupture discs 164 to keep the fluid from mixing prematurely. Alternatively, a valve, check valve, or other device can be used to contain the fluids within reservoirs 152, 156. In embodiments where it is desirable to have the fluids mix prior to entering bore 104, the fluids can be mixed in tubing 166. In one embodiment, tubing 166 can include a mixing device (not shown) to promote the mixing of the fluids. The mixing device can be, for example, a vortex or series of baffles. This can be useful when the sealant is an epoxy having a separate curing agent. The reservoirs 152, 156 can be, but are not required to be, the same size or the same configuration. The fluid or fluids from the reservoirs 152, 156 can travel through tubing 166 to injection port 168, which is in communication with bore 170. A check valve 172 can be used to prevent fluid from bore 104 from entering tubing 166.

[0028] In one embodiment, the fluids can be a solvent and an elastomer, or a solvent and an epoxy. For example, reservoir 152 can initially contain a solvent that is suitable to displace grease, while reservoir 156 initially contains an elastomer sealant. The solvent, such as, for example, methanol, can be injected into bore 170 first, and used to displace grease from cable 174. After a predetermined condition, such as a given amount of time, the elastomer from reservoir 156 can be injected into bore 170 to fill gaps in cable 174. This can be useful when, for example, grease is occupying the gaps in cable 174 and that grease would prevent the elastomer from filling the gaps. Because the grease can be displaced over time, and thus undermine the seal, it can be beneficial to displace the grease before injecting the elastomer. In embodiments that do not use a solvent, the pressure of the sealant can displace some or all of the grease as the sealant is injected into the bore. In one embodiment, a solvent from a first reservoir 152 can be used to first displace and flush any grease that may be on cable 174, followed an etching agent

from the second reservoir 156. The etching agent can be used to clean and prepare surfaces within cable 174 and within bore 170 to better adhere to the sealant. A sealant from a third reservoir (not shown) can then be injected under high pressure to fill the gaps and adhere to the surfaces of cable 174 and bore 170.

[0029] Still referring to Figure 7, injection module 150 can be connected to lower riser package ("LRP") 176. Restrictors such as rams 178 can be used to close bore 170. A sleeve 182 can run through LRP 176 and be used to guide cable 174. Injection port 168 can be connected to sleeve 182 so that sealant is injected into sleeve 182 when injection module 150 is actuated. When rams 178 move inward toward the center of bore 170, they apply sufficient pressure to deform sleeve 182 around cable 174 such that the inner diameter of sleeve 182 is pressed against the outer diameter of cable 174. When the sealant is injected into sleeve 182, the flow path of least resistance will be through the gaps 108 (Figures 4 & 5), thus imparting sealant into cable 174. Furthermore, less sealant is required because the narrow diameter of sleeve 182 and the constriction of sleeve 182 due to rams 178 reduces the volume of sealant that must be injected. In some embodiments, the sealant does not flow axially past rams 178 due to the tight constriction. In some embodiments, some sealant does flow past rams 178 is it fills gaps 108.

[0030] The sealant injection system is not limited to use in a pressure control head. It can be used with any of a variety of wellbore devices, especially devices that constrict the bore around a wireline. As shown in Figure 8, injection module 186 can be used in conjunction with blowout preventers 188. In this embodiment, rams 190 move inward toward the center of bore 192 to prevent fluid flow through bore 192. Injection module 186 can inject sealant 194 into bore 192 to fill gaps within cable 196, which is extended between rams 190. Sealant 194 can flow between rams 190 and adhere to the opposing faces of rams 190 and the annular gaps between

rams 190 and cable 196. Because it is injected under high pressure, sealant 194 can be forced through the strands of cable 196, in the vicinity of rams 190, and fill gaps within cable 196.

[0031] Still referring to Figure 8, injection module 186 can be of various configurations suitable for injecting sealant into bore 192. In the embodiment shown in Figure 7, injection module 186 includes a reservoir 198 that is a cylindrical vessel, although reservoir 198 can be other shapes. Pump 200 is connected to reservoir 198. Pump 200 can be any type of pump including, for example, a diaphragm pump or a centrifugal (impeller) pump. Tubing 202 can connect injection module 186 to bore 192. One or more injection ports 204 can be used to inject sealant 194 into bore 192. Figure 7 is shown with two injection ports 204 spaced apart around bore 192, each with a check valve 206. In some embodiments, the injection ports can be located axially nearer to one or the other restrictor such as rams 190.

[0032] Referring to Figure 9, injection module 208 can be located apart from riser 210. For example, injection module 208 can be located inside a remote operating vehicle ("ROV") 212. In this embodiment, an injection port 214 is connected to riser 210, between a pair of BOPs 216. Connector 218 of ROV 212 can connect to injection port 214 to inject a sealant into the bore of riser 210. For example, ROV 212 can stab into a fluid passage in communication with injection port 214 and, thus, in communication with the bore of riser 210. Connector 218 can be, for example, a quick disconnect fitting that mates to a corresponding quick disconnect fitting on injection port 214. ROV 212 can connect connector 218 to injection port 214 so that after the restrictor, such as BOPs 216, close around cable 220, injection module 208 can inject sealant through injection port 214 to infuse cable 220 with sealant.

[0033] Referring to Figure 10, in another embodiment, injection module 222 can be used with lubricator 224. In this embodiment, the restrictors are the lubricators 226, with no other restrictors required. Injection module 222 can inject sealant through injection port 228 and into bore 230 of lubricator 224. The sealant can permeate through bore 230 and into cable 232, so that cable 232 can form a better seal against lubricators 226. In the embodiment shown in Figure 10, injection module 222 has a lead screw 234 to inject sealant from reservoir 236, through check valve 238, into bore 230.

[0034] Referring back to Figures 1-3, in operation of an embodiment, a seal can be formed around cable 100 that extends through a conduit, such as bore 104, and a subsea wellhead assembly into a wellbore. The seal can be formed by, for example, providing upper and lower passage restrictors such as packing set 116 in the conduit above the wellhead assembly. An injection module 124 can be connected to injection port 128, which is a port through a sidewall of bore 104. Injection port 128 is located between the upper packing set 116 and the lower packing set 116. Injection module 124 can have an injector and a reservoir 132, the reservoir 132 can initially contain a curable sealant 126.

[0035] The wellbore restrictors, such as packing sets 116, can be actuated so that sealing face 122 of the restrictors move radially toward the center of bore 104. Curable sealant can be injected from injection module 124, through injection port 128 so that curable sealant 124 flows around cable 100 between the upper and lower passage restrictors. In some embodiments, the restrictors can be actuated before curable sealant 124 is injected.

[0036] In some embodiments, the restrictors can be actuated after curable sealant 124 is injected. Curable sealant 124 can fill bore 104, permeate gaps 108 (Figure 4) in cable 100, and fill any

annulus space that may exist between the restrictors (such as sealing face 122 of packing set 116) and the outer diameter of cable 100. In embodiments, curable sealant 124 can cure to form a plug encompassing cable 100 and filling the space between cable 100 and the as-yet un-actuated restrictors. Subsequently, when the restrictors are actuated, sealing face 122 can move inwards to exert pressure against the now cured, or solidified, curable sealant 124, thus energizing curable sealant 124 as a seal between sealing face 122 and cable 100. In some embodiments, curable sealant 124, after it has cured, can provide the assistance of a preload force between any or all sealing surfaces.

[0037] In embodiments, curable sealant 124 can be stored as two or more separate components in two or more separate vessels 152, 156 in the reservoir. The two or more separate components 154, 158 can react to form the curable sealant when the components are mixed prior to or during the injection of the components through injection port 128. In embodiments, cable 100 can include a braided material and curable sealant 124 can be injected into the braided material. In embodiments, cable 100 can be remain axially stationary during the injection of curable sealant 124 and during the actuation of the restrictors. In some embodiments, cable 100 can be axially moved after the injection of curable sealant 124 so that the portion of cable 100 having sealant 124 is moved toward a restrictor prior to actuating the restrictor. In some embodiments, the reservoir can include a first and second container. The first container can initially contain a solvent and the second container can initially contain curable sealant 124. The solvent can be injected before the sealant to remove grease from cable 100, and then curable sealant 124 can be injected.

[0038] While the invention has been shown or described in only some of its forms, it should be apparent to those skilled in the art that it is not so limited, but is susceptible to various changes without departing from the scope of the invention.

What is claimed is:

1. An apparatus for sealing a passage around a cable, the apparatus comprising:

an axial passage adapted to have the cable passing therethrough, the cable having a plurality of strands;

an upper restrictor and a lower restrictor for closing the axial passage, the upper and lower restrictors occupying the annular space between an inner diameter of the axial passage and an outer diameter of the cable; and

an injection module having an injector and a reservoir, the injection module being in fluid communication with the axial passage at an axial location between the upper restrictor and the lower restrictor, the injector discharging a sealant initially stored in the reservoir into the axial passage so that at least a portion of the sealant contacts the cable at the axial location of the restrictor while the cable remains static.

2. The apparatus according to Claim 1, wherein the upper restrictor and the lower restrictor cause the sealant to flow between at least a portion of the plurality of strands.

3. The apparatus according to Claim 1, wherein the upper restrictor comprises an upper pair of rams and the lower restrictor comprises a lower pair of rams, each pair of rams moving axially inward to a constricted position to constrict the bore, the constricted position reducing the flow of sealant out of the axial passage, thereby forcing at least a portion of the sealant to enter a plurality of voids between the strands.

4. The apparatus according to Claim 1, wherein reservoir comprises a first chamber and a second chamber, the first chamber initially having a solvent, the solvent being a fluid that removes grease, and the second chamber initially having the sealant, wherein the solvent is discharged into the axial passage before the sealant is discharged into the axial passage.

5. The apparatus according to Claim 1, wherein the reservoir is located in a remotely operated vehicle, the remotely operated vehicle stabbing into a fluid passage in communication with the axial passage.

6. The apparatus according to Claim 1, wherein the sealant comprises suspended particulate, the suspended particulate lodging in flow restrictions within the plurality of strands of the cable.

7. The apparatus according to Claim 1, further comprising a sleeve in the passage adapted to pass the cable therethrough, the sleeve adapted to initially have an inner diameter greater than an outer diameter of the cable, and being deformable to reduce the annular space between an inner diameter of the sleeve and the outer diameter of the cable prior to discharging the sealant.

8. The apparatus according to Claim 1, wherein the sealant is a curable polymer that hardens after being injected.

9. The apparatus according to Claim 1, wherein at least a portion of the sealant displaces grease located within the plurality of braided strands.

10. A method for sealing around a cable extending through a conduit and a subsea wellhead assembly into a wellbore, the method comprising:

(a) providing upper and lower passage restrictors in the conduit above the wellhead assembly;

(b) providing an injection module connected to a port through a sidewall in the conduit, the port being located between the upper passage restrictor and the lower passage restrictor, the injection module having an injector and a reservoir, the reservoir initially containing a curable sealant;

(c) actuating the wellbore restrictor to cause the upper and lower passage restrictors to move radially toward the center of the wellbore; and

(d) injecting the curable sealant from the injection module through the port in the conduit around the cable between the upper and lower passage restrictors.

11. The method according to Claim 10, wherein the curable sealant is stored as two or more separate components in two or more separate vessels in the reservoir, the two or more separate components reacting to form the curable sealant, and wherein step (d) comprises mixing the two or more separate components prior to injecting the curable sealant.

12. The apparatus according to Claim 10, wherein the cable comprises a braided material, and wherein step (d) includes injecting the curable sealant into the braided material.

13. The apparatus according to Claim 10, wherein the cable remains axially stationary during steps (c) and (d).

14. The apparatus according to Claim 10, wherein step (d) occurs prior to step (c).

15. The apparatus according to Claim 10, wherein the reservoir comprises a first and second container, the first container initially containing a solvent and the second container initially containing the curable sealant, and wherein step (d) comprises first injecting the solvent to remove a grease from the cable and then injecting the curable sealant.

16. An apparatus for sealing around a cable extending through a subsea wellhead assembly into a wellbore, the apparatus comprising:

an axial passage having a conduit adapted to extend above the wellhead assembly and having an axial passage through which the cable extends, ;

a sleeve located in the passage, the cable extending through the sleeve, and the sleeve being deformable to reduce the annular space between an inner diameter of the sleeve;

an upper restrictor comprising an upper pair of rams and a lower restrictor comprising a lower pair of rams, each of the upper pair of rams and lower pair of rams moving from a first position to a second position to deform the sleeve to occupy the annular space between an inner diameter of the axial passage and an outer diameter of the cable; and

an injection module having an injector and a reservoir, the injection module being in fluid communication through a sidewall of the axial passage to a location within the axial passage between the upper restrictor and the lower restrictor, the injector discharging a curable sealant initially stored in the reservoir into the axial passage to seal between the cable and the sleeve.

17. The apparatus according to Claim 16, wherein the cable comprises a plurality of strands and wherein upper restrictor and the lower restrictor cause the sealant to flow between at least a portion of the plurality of strands.

18. The apparatus according to Claim 17, wherein the sealant comprises suspended particulate, the suspended particulate lodging in flow restrictions within the plurality of strands of the cable.

19. The apparatus according to Claim 16, wherein reservoir comprises a first chamber and a second chamber, the first chamber initially having a solvent, the solvent being a fluid that removes grease, and the second chamber initially having the sealant, wherein the solvent is discharged into the axial passage before the sealant is discharged into the axial passage.

20. The apparatus according to Claim 16, wherein the reservoir is located in a remotely operated vehicle, the remotely operated vehicle stabbing into a fluid passage in communication with the axial passage.