|  |  |  |  |
| --- | --- | --- | --- |
| itu_logo | **Международный союз электросвязи**  **Бюро стандартизации электросвязи** | |  |
|  | |  | |

Женева, 4 сентября 2015 года

|  |  |  |
| --- | --- | --- |
| Осн.:  Тел.: Факс: Эл. почта: | **Циркуляр 170 БСЭ** COM 15/HO  +41 22 730 6356 +41 22 730 5853 [tsbsg15@itu.int](mailto:tsbsg15@itu.int) | – Администрациям Государств – Членов Союза  – Членам Сектора МСЭ-Т  – Ассоциированным членам МСЭ-Т  – Академическим организациям − Членам МСЭ |
| **Копии**:  – Председателю и заместителям председателя 15-й Исследовательской комиссии  – Директору Бюро развития электросвязи  – Директору Бюро радиосвязи |

|  |  |
| --- | --- |
| Предмет: | **Вопросник по кабельным судам и погружному оборудованию** |

Уважаемая госпожа,  
уважаемый господин,

15-я Исследовательская комиссия на своем последнем по времени собрании, которое состоялось в Женеве с 22 июня по 3 июля 2015 года, приняла решение о том, чтобы в рамках исследований, проводимых по Вопросу 8/15 (*Характеристики подводных волоконно-оптических кабельных систем*), пересмотреть Рекомендацию МСЭ-Т G.971 (*Общие свойства подводных волоконно-оптических кабельных систем*) и обновить существующее Дополнение I, в котором представлены данные по кабельным судам и погружному оборудованию.

Пересмотренную Рекомендацию МСЭ-Т G.971 планируется представить для получения согласия на собрании 15-й Исследовательской комиссии в сентябре 2016 года.

В связи с этим просим вас, при необходимости, изменить существующие данные по кабельным судам и погружному оборудованию, представленные в **Приложении 1** к настоящему Циркулярному письму. Если указанное в перечне оборудование более не используется и/или если после 2010 года построены новые кабельные суда и созданы новые типы погружного оборудования, просьба представить их описание (на английском языке) в соответствии с **Приложением 2**.

Просьба вернуть ваши предлагаемые измененияредактору Рекомендации МСЭ-Т G.971 не позднее **31 декабря 2015 года** по адресу:

Mr. K. Nakajima

NTT Access Network Service Systems Laboratories

1-7-1, Hanabatake, Tsukuba, Ibaraki

305-0805, Japan

Эл. почта: [nakajima.kazuhide@lab.ntt.co.jp](mailto:nakajima.kazuhide@lab.ntt.co.jp)

Факс: +81 29 868 6142

Заранее благодарю вас за ваше сотрудничество в обеспечении того, чтобы ваши ответы были как можно более точными и поступили до указанного предельного срока.

С уважением,

Чхе Суб Ли  
Директор Бюро  
стандартизации электросвязи

**Приложения**: 2

ANNEX 1

Data on cable ships and submersible equipment of various countries

**1.1 Cable ships**

| **Name of ship** | **Year of cons-truction** | **Dis-place-ment (tons)** | **Overall length (m)** | **Draft (m)** | **Normal speed (knots)** | **Range (auto-nomy) (nautical miles)** | **Number of tanks** | **Cable capacity** | | | **Cable gear** | | | | **Max operating depth (m)** | **Capability** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cable** | | **Re-peaters** | **Cable engine** | | **Unwinding pulley** | |
| **Cubic metres (m3)** | **Weight (tons)** | **Drum (diameter) (m)** | **Linear (pairs of wheels)** | **Bow sheave (diameter) (m)** | **Stern sheave (diameter) (m)** |
|  |  |  |  |  |  |  | **DENMARK** *Ships belonging to Tele Denmark* | | | | |  |  |  |  |  |
| ***Peter Faber*** | 1982 | 3680 | 78.35 | Ice 3.8 Summer 5.0 | 13.0 | 7000 | 1 tank  1 hold | 310  230 | 600  400 | App. 10 | 3.0 |  | 2 × 3.0 | – | 4000 | Reinforced for operation in ice-filled waters. A-frame for ROV. Two hydraulic double-drum warping winches. |
| ***Lodbrog*** | 1985/ 2002 | 12'503 | 143.4 | 8.50 | 16.0 | 10'000 | 6 | 2940 | 5040 | 84 | 2 × 4.0 (25 t) | 2 × 6 (6 t) | – | 2 × 3.0 | All | Laying/burying and repair of all types of cables (coaxial, optical fibre and power cables). ROV capability, SWL 8 ton. |
|  |  |  |  |  |  |  | **FINLAND***1)**Ship belonging to Sonera Ltd* | | | | |  |  |  |  |  |
| ***M/S Telepaatti*** | 1978 (modifi-cation) | 450 | 42.6 | 3.0 | 12 | – | 1 | – | 350 | – | 2 linear engines with 3 caterpillar tracks on each | 3.0 |  | 300 |  | Laying of all types of telecom cables. Specially equipped for cable route survey and cable repair. Fully automatic autopilot and DP‑system. |
|  |  |  |  |  |  |  | *2) Ship belonging to YIT Primatel* | | | | |  |  |  |  |  |
| ***c/s Telepaatti*** | 1978 Modifi-cation 1999 | 450 | 42.6 | 3.0 | 10.5 | – | 1 | 250 | 260 | – | – | 2 linear engines with 3 cater-pillar tracks on each | 3.0 | – | 300 | Laying of all types of telecom cables and < 150 mm power cables.  Specially equipped for cable route survey and cable repair.  Fully automatic autopilot and DP‑system. |
|  |  |  |  |  |  |  | **FRANCE** *1)**Ships belonging to France Telecom Marine* | | | | | |  |  |  |  |
| ***Chamarel (formerly Vercors)*** | 1974 | 11'000 | 136 | 7.2 | 16.0 | 12'000 | 3 | 2425 | 4900 | 144 | 3.0 | 24 | 3.0 | Chute | All | Laying and repair of all types of telecom cables. Burying of cables with plough and 200 kW Hector 4. |
| ***Léon Thevenin*** | 1983 | 6800 | 107 | 6.24 | 15.0 | 10'000 | 2 + 1 | 1420 | 2000 | 11 | 3.4 | 12 | 3.0 | Chute | All | Laying and repair of all types of telecom cables. Burying of cables using 300 kW Hector 5. |
| ***Raymond Croze*** | 1983 | 6800 | 107 | 6.24 | 15.0 | 10'000 | 2 + 1 | 1420 | 2000 | 11 | 3.4 | 12 | 3.0 | Chute | All | Laying and repair of all types of telecom cables. Burying of cables using 250 kW Hector 3. |
| ***René Descartes*** | 2002 | 15'450 | 114.50 | 7.42 | 16.0 | 12'000 | 4 | 3250 | 5500 | 210 | 4.0 | 20 | Aft sheave 3.0 m | Sheave | All | Stem concept cable ship. Laying and repair of all types of telecom cables. Burying of cables with plough and 250 kW ROV Hector 6. |
|  |  |  |  |  |  |  | *2) Ships belonging to Alda Marine* | | | | | |  |  |  |  |
| ***Ile de Sein Ile de Batz Ile de Brehat*** | 2002 | 18'006 | 140.4 | 8.016 | 15.0 | 15'000 | 2 + 2 | 3000 | 5500 | 202 | 4.0 | 21 | NA | 3.0 | All | Laying and repair of all types of telecom cables. Burying of cables with. 2/3m Rock plough. Sea state 7 A-frame |
| ***Ile de Ré*** | 1983 rebuilt 2002 | 12'687 | 143.4 | 7.23 | 16.0 | 11'000 | 3 + 3 | 2900 | 4500 | 84 | 2 × 4.0 | NA | NA | 3.0 | All | Laying and repair of types of cable. ROV to 2500 m. A plough is available. |
|  |  |  |  |  |  |  | **ITALY** *1) Ships belonging to Elettra TLC S.p.A* | | | | | |  |  |  |  |
| ***Teliri*** | 1996 | 6500 | 111.5 | 6.5 | 14.01 | 10'000 | 3 | 2000 | 2600 | 70 | 2 × 3.5 | 18 | 3 | 4 | All | Laying and repair optical fibre systems. |
| ***Certamen (ex John Cabot)*** | 1966 rebuilt  1998 | 5000 | 96.6 | 7.3 | 12.0 | 8000 | 3 | 600 | 1900 | 24 | 1 × 3.0 | 18 (on the stern) + 6 (on the bow) | 3 | 3 | All | Laying, survey and repair optical fibre systems. |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **ITALY** *2) Ships belonging to Prysmian Cavi e Sistemi Energia S.r.l.* | | | | | |  |  |  |  |
| ***Giulio Verne*** | 1984 | 16'900 | 133.18 | 8.5 | 10 | 7000 | 2 | 2600 | 7000 | 10 | 6.0 (55 t) | 1 (Pads  type 10 t) | – | 6.0 | All | Lay and repair from the stern. |
|  |  |  |  |  |  |  | **SPAIN** *Ships belonging to Tyco Submarine Systems Ltd.* | | | | | |  |  |  |  |
| ***Teneo*** | 1992 | 4000 | 81 | 5.7 | 14.5 | 4200 | 2 | 500 | 1000 | 20 | 2 × 3.5 | 1 × 9 | 2 × 3 | 1 × 3 | All | Lays and repairs of all types of telephone cables. |
|  |  |  |  |  |  |  | **JAPAN** *1) Ships belonging to Kokusai Cable Ship (KCS)* | | | | | |  |  |  |  |
| ***KDDI Ocean Link*** | 1992 | 11'700 | 133.2 | 7.0 | 15 | 10'000 | Main 3 Spare 4 | 2600 | 4500 | 57 | 3.6 | 21 | 3.2 | 4.0 | All | Laying by linear engine. Lays and repairs all types of submarine cables. |
| ***KDDI Pacific Link*** | 1997 | 11'207 | 109.0 | 7.5 | 11 | 10'000 | Main 2 Spare 2 | 2720 | 4500 | 50 | 3.6 | 20 | – | 3.0 | All | Laying by linear engine. Lays and repairs all types of submarine cables. |
|  |  |  |  |  |  |  | *2) Ships belonging to NTT World Engineering Marine Corporation (NTT-WE Marine)* | | | | | |  |  |  |  |
| ***Subaru*** | 1999 | 9557 | 123.3 | 7.0 | 13.2 | 8800 | Main 2 Spare 2 | 2770 | 4000 | 50 | 4.0 | 21 | – | 3.2 | All | Lays and repairs all types of telephone cables. |
| ***C/S VEGA*** | 1984 | 2293 | 74.3 | 4.5 | 13.0 | 4500 | 2 | 169 | 250 | – | 3.0 | 6 | 2.5 | 2.0 | All | Lays and repairs for non-powered telephone cable system.  DP, ROV system |
|  |  |  |  |  |  |  | **UNITED KINGDOM** *1) Ships belonging to British Telecommunications plc* | | | | | |  |  |  |  |
| ***Sovereign*** | 1991 | 13'018 | 131 | 7.0 | 13.5 | 14'000 | 4 | 2800 | 6200 | 90 | 3.50 |  | 3.00 | 3.50 | All | Lays, repairs all types of coaxial and optical fibre cable. (Operated by C&W marine.) |
|  |  |  |  |  |  |  | **UNITED KINGDOM** *2) Ships belonging to Global Marine Systems Ltd* | | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Ditto (no plough). |
| ***MV Cable Installer*** | 1980 | 6065 | 89.42 | 5 | 12 | 42 days | 4 | 840 | 1600 | None | 3.0 | 4-track pair | – | 3.0 | – | Repeaterless installation vessel fully DP Cegelec 901 system. |
| ***Seaspread*** | 1980 | 10'887 | 116 | 6.8 | 13 | 65 days | 2 | 1010 | 1701 | – | 2 × 3 | – | – | 3 | All | Lays/repairs by aft drums. Burial by plough. Lays/repairs armoured and lightweight cables. |
| ***Pacific Guardian*** | 1984 | 7526 | 116 | 6.32 | 14.0 | 8000 | 3 | 1416 | 3470 | 96 | 3.5 |  | 3.00 | 3.00 | All | Laying by linear cable engine. Lays and repairs armoured and lightweight cables. |
| ***Sir Elic Sharp*** | 1988 | 7526 | 115 | 6.3 | 13.5 | 9600 | 3 | 1416 | 1700 | 96 | 2 × 3.5 | – | 3 | 3 | All | Laying by linear cable engine. Repairs and lays armoured and lightweight cables. Post lay/repair burial by integral ROV. |
|  |  |  |  |  |  |  | **UNITED KINGDOM** *3) Ships belonging to Global Marine Systems Ltd* | | | | | |  |  |  |  |
| ***MV Cable Innovator*** | 1995 | – | 142 | 8.3 | 14.5 | 42 days | 4 | 4900 | 7500 | 180 | 4.0 | 21 pairs (min) | – | 4.0 | – | Simplex *D*/*P* system. Lays/repairs cables. |
|  |  |  |  |  |  |  | **MARSHALL ISLANDS** *Ships belonging to Tyco Submarine Systems Ltd.* | | | | | |  |  |  |  |
| ***CS Coastal Connector*** | 1997 Conver-ted in 1996 | 6761 | 92.47 | 7.1 | 12.5 | 25'000 | 3 main 1 spare | 675 (main, total) 70 (spare) | 1600 | 30 | 2 × 3 | N/A | N/A | 2 × 3 | – | The CS Coastal Connector is a stern‑laying design. She is capable of deploying the SCARAB II, SCARAB IV, and Pacific SCARAB I ROVs, as well as the Seabed Tractor. |
| ***CS Tyco Provider*** | 1978, Conver­ted in 1999 | 14'500 | 139.4 | 7.6 | 14.5 | 20'000 | 5 | 3349 | 6000 | 100+ | 2 × 4 | – | – | 2 × 3 | – | The CS Tyco Provider is a stern‑laying design. She is capable of deploying Sea Plow VIII. |
|  |  |  |  |  |  |  | **UNITED STATES OF AMERICA** *Ships belonging to AT&T* | | | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ***CS NIWA (ex. CS Global Link)*** | 1990 | 16'375 | 145.7 | 8.08 | 15 | 10'000 | 3 main, 4 spare | 3258 (main, total)  164 (spare, total) | 6098 | 100+ | 2 × 3.7 | 1× Western Gear Tractor Type | 2 × 3 | 1× trough/ Chute type | – | The CS NIWA is capable of deploying the SCARAB II ROVs. |
|  |  |  |  |  |  |  | **UNITED STATES OF AMERICA** *Ships belonging to AT&T* | | | | | |  |  |  |  |
| ***Gulmar Badaro  (ex. CS Global Mariner)*** | 1993 | 15'638 | 151.5 | 7.8 | 13.8 | 10'000 | 2 main,  3 spare | 2172 (main, total) 447 (spare, total) | 4999 | 80+ | 2 × 3.7 | 1× Dowty 21 pairs | 2 × 3 | 1× trough/ Chute type | – | The Gulmar Badaro is capable of deploying the SCARAB II and SCARAB IV ROVs, as well as Sea Plow VII, Sea Plow VIII, and the Seabed Tractor. |
| ***CS Global Sentinel*** | 1991 | 16'375 | 145.7 | 8.08 | 15 | 10'000 | 3 main, 4 spare | 3258 (main, total) 164 (spare, total) | 6098 | 100+ | 2 × 3.7 | 1× Dowty 21 pairs | 2 × 3 | 1× trough/ Chute type | – | The Global Sentinel is capable of deploying the SCARAB II and SCARAB IV, and Pacific SCARAB I ROVs, as well as Sea Plow VII and Sea Plow VIII. |
| NOTE – Only relatively short cables are laid and only shore-end. | | | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  | **UNITED ARAB EMIRATES** *Ships belonging to E-marine PJSC* | | | | | |  |  |  |  |
| ***CS Etisalat*** | 1990 | 2221 | 74.7 | 4.5 | 13 | 35 days | 3 | 667 | 600 | 12 | 3 | 6 | 3 | 4 | Unlimited | Surface lay, maintenance, ROV inspection and jet burial. |
| ***CS NIWA*** | 1990 | 16'375 | 145.66 | 8.08 | 15 | 60 days | 3 main  4 spare | 3258 | 6098 | 152 | 4 | 18 | 4 | 4 | Unlimited | Surface lay, plough burial, maintenance, work class ROV inspection and jet burial. |
| ***CS UAA*** | 1972  Conver-ted in 1996 | 7800 | 133.7 | 6.15 | 13 | 48 days | 3 main  1 spare | 3360 | 4500 | 120 | 4 | 18 | 4 | 4 | Unlimited | Surface lay, plough, maintenance, work class ROV inspection and jet burial. |
|  |  |  |  |  |  |  | **REPUBLIC OF KOREA** *Ships belonging to KT Submarine* | | | | | |  |  |  |  |
| ***SEGERO*** | 1998 | 8323 | 115 | 7.8 | 12 |  | 4 | 4500 | 2218 | 70ea | 2 × 4 | 2 × 4 | – | 3.6 |  |  |

**1.2** **Submersible equipment**

| **Type of submersible** | **Weight (tons)** | **Overall length (m)** | **Width (m)** | **Height (m)** | **Trenching system** | **Trenching** | **Propulsion** | **Max  operating depth (m)** | **Max pulling tension (tons)** | **Capability** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **FRANCE** *Submersibles belonging to France Telecom Marine* | | | |  |  |  | |
| ***ELISE2 Submersible Plough system*** | 17 | 7.60 | 2.90 | 2.95 | Ploughshare | Immediate burial up to 1.1 m | Towed by support ship | 1500 |  | Lay and bury all types of cables. | |
| ***ELISE3 Submersible Plough system*** | 17 | 7.60 | 2.90 | 2.95 | Ploughshare | Immediate burial up to 1.1 m | Towed by support ship | 1500 |  | Lay and bury all types of cables. | |
| ***Self-advancing buried system CASTOR2*** | 12 | 7.0 | 2.40 | 3.00 | Trenching wheel or chain | Burial of existing cables down to 2 m | Tracked vehicle | 1000 |  | Burial of cables and pipes. Visual inspection. | |
| ***ROVs HECTOR 3, 4, 5 & 6*** | 9 | 4.0 | 3.50 | 2.10 | High-pressure water jets | Up to 1.5 m depth | Thrusters (inspection) Back drive (burial) | 2000 |  | Visual inspection, post-lay burial, cable location, cable manipulation, cable cutting. | |
|  |  |  |  | **FRANCE** *Submersibles belonging to France Telecom Marine* | | | |  |  |  | |
| ***Remote control submersible Scorpio 2000*** | 3.4 | 2.9 | 1.5 | 2.11 | High-pressure water jets | Up to 60 cm depth | Thrusters | 1000 |  | Visual inspection, post-lay burial, cable location/manipulation/cutting. | |
|  |  |  |  | **ITALY** *1) Submersibles belonging to Elettra TLC SpA* | | | |  |  |  | |
| ***Plough Taurus 1*** | 14 | 9 | 4.6 | 4.5 | Plough share | Up to 1 m | Towed by cable ship | 1500 | 50 | Lay and bury all types of cables. | |
| ***Plough Taurus 2*** | 16 | 9.5 | 4.5 | 5.1 | Plough share | Up to 1.5 m | Towed by cable ship | 1500 | 50 | Lay and bury all types of cables. | |
| ***ROV – Phoenix 2*** | 6.8 | 4.8 | 2 | 2.6 | High/low-pressure jetting | Up to 1.2 m | 8 Hydraulic thrusters | 1000 |  | Visual inspection, post-lay burial, cable location/manipulation/cutting. | |
| ***ROV-T200*** | Free-fly mode 6, Track mode 7 | 3.1 | 2 | 2.2 | High/low-pressure jetting | Up to 1.2 m | 4 vertical and 4 horizontal thrusters | 2500 |  | Visual inspection, post-lay burial, cable location/manipulation/cutting. | |
|  |  |  |  | **UNITED KINGDOM** *Submersibles belonging to Global Marine Systems Ltd* | | | |  |  |  | |
| ***Submersible trencher*** | 17.0 | 6.6 | 4 | 3.4 | Fluidization and cutting jets and dredge pump | Up to 1 m depth with cutting and fluidization jets | Three vertical and four horizontal thrusters, track drive differential steering | 274 |  | Trench in existing cable and pipe. | |
| ***Submersible Plough system*** | 9.75 | 6.1 | 2.6 | 2.6 | Ploughshare proceeded by disc | Immediate burial of cable on ploughing | Towed by support ship | 900 |  | Lay and bury cable, umbilical and pipe in one action giving full cable protection. | |
| ***Remote control submersible 2 off Cirus A&B*** | 3.2 | 3.5 | 2.1 | 2.3 | Water jets | Trenching capability 0.3 m | Thrusters (7) | 1000 |  | Visual inspection, cable location/inspection/deburial, manipulation. Tools include cable cutter, cable gripper and 2 manipulators with line cutters. | |
| ***Plough 2 off A&B*** | 14.5 | 9 | 4.1 | 4 | Passive blade | Trenching capability 1.0 m | Towed | 1000 |  | Steerable, repeater burial. | |
| ***Remote control submersible  ROV 128*** | 7.5 | 2.9 | 1.8 | 2.0 | Jetting tool | Trenching capability 0.6 m | Tracked burial Thrusters survey | 1000 (burial) 2000 (survey) |  | Tools include cable cutter, cable gripper and 2 manipulators with line cutters. | |
| ***Underwater vehicle- MARLIN*** | 7.8 | 4.191 | 2.438 | 3.175 | Burial skid | To 1.0 m (Optimized for 0-30 kPa soil) | Hydraulic driven thrusters | 2500 |  | Burial, deburial, inspection. Maintenance and repair. Tools include cable cutter, cable gripper. | |
|  |  |  |  | **UNITED KINGDOM** *Submersibles belonging to Global Marine Systems Ltd* | | | |  |  |  | |
| ***Scarab I – Umbilically tethered ROV*** | 3.2 | 2.74 | 1.82 | 1.52 | Jetting tool | Up to 0.6 m | Thrusters: 2 vertical 4 vectored | 2000 |  | Cable detection and inspection. Visual survey. Cable manipulation and cutting Debris elimination. Cable and repeater burial/deburial. | |
| ***Subtrack – ROV*** | 10.0 | 8.0 (Max) | 3.7 | 3.8 | Jetting tool | Burial to 1.0 m | Electro-hydraulic track drives | 1000 |  | Cable burial and deburial. Inspection. Maintenance and repair. | |
| ***EUREKA: Deepwater burial + trenching system*** | 17 (Max) | 5.5 | 4.2 | 3.85 | Jetting tool Rock wheel cutter Mechanical chain excavator | 1 m 1.2 m 2.2 m | Electro-hydraulic track drives | 1500 |  | Capable of burying cable, small flexible flowlines and also rigid pipes. Can also debury cable and restore. Visual and electronic inspections. | |
| ***Plough 5*** | 14.0 | 9.0 | 4.6 | 3.7 | Passive blade | Variable from 0-1100 mm (600-900 mm in all conditions) | Towed | 1000 |  | Simultaneously lay and bury cables and umbilicals at varying depths. | |
| ***Plough 6 and 7*** | 14.0 | 9.0 | 4.6 | 3.7 | Passive blade | Max burial depth: 1100 mm | Towed | 1000 |  | Simultaneously lay and bury cables and umbilicals at varying depths. | |
| ***Cable Plough 1000 mm*** | 14.4 | 9.75 | 4.1 | 3.9 | Passive blade | 1000 mm (Good conditions:  1100 mm; Repeaters/Joints: 500 mm) | Towed | 1000 |  | Simultaneously lay and bury cables and umbilicals at varying depths. | |
|  |  |  |  | **DENMARK** *Submersibles belonging to Telecom Denmark* | | | |  |  |  | |
| ***Plough D*** | 13.5 | 9.0 | 4.6 | 3.7 | Plough share | Variable from  0‑1100 mm (600‑900 mm in all conditions) | Towed by host vessel | 1500 |  | Lay and bury telecom cables, power cables and umbilicals. Cables: Up to 120 mmφ (bury). Joints and repeaters: Up to 400 mmφ (pass). | |
| ***Plough 7*** | 13.5 | 9.0 | 4.6 | 3.7 | Plough share | Variable from 0-1100 mm (600-900 mm in all conditions) | Towed by surface vessel | 1000 |  | Lay and bury fibre optic cables, power cables and umbilicals. | |
| ***Subtrack- Subsea tractor*** | 10.0 | 8.0 (Max) | 3.7 | 3.8 | Jetting tool | Burial to 1.0 m | Electro-hydraulic track drives | 1000 |  | Cable burial and deburial. Inspection. Maintenance and repair. | |
|  |  |  |  | **DENMARK** *Submersibles belonging to Telecom Denmark* | | | |  |  |  | |
| ***Super Phantom S4-ROV*** | 0.09 | 1.5 | 0.75 | 0.6 | – | – | Thrusters 4 prop fwd/aft 2 prop vertical 2 prop transverse | 300 |  | Inspect cables and other underwater objects. Can also be used to inspect seabed conditions. | |
|  |  |  |  | **JAPAN** *1) Submersibles belonging to KCS* | | | |  |  |  | |
| ***MARCAS-II-ROV*** | Jet tool mode: 8.0 Track base mode: 7.5 | Jet tool mode: 2.9 Track base mode: 5.3 | Jet tool mode: 2.3 Track base mode: 4.0 | Jet tool mode: 3.2 Track base mode: 3.8 | Water jet tool | Up to 1.0 m  Track base mode: 1.5 m | 4 horizontal, 4 vertical and 2 jet thrusters | Jet tool mode: 2500 Track base mode: 2000 |  | Post-lay burial, maintenance of cable. Can survey seabed. | |
| ***MARCAS-III-ROV*** | Jet tool mode: 17.0 | 6.3 | 3.7 | 3.4 | Water jet tool | Up to 3.0 m | Thrusters(8)  4 horizontal, 2 vertical, 2 for standby (redundant) | 2500 |  | Post-lay burial, maintenance of cable.  Can survey seabed. | |
| ***PLOW-II*** | 18.5  Jet tool mode: 20.0 | 9.5 | 5.6 | 5.0 | Plough share  Water jet tool | Up to 3.0 m | Towed by cable ship | 1500 Jet tool mode: 200 | 80 | Simultaneously lay and bury cables and umbilicals at varying depth. | |
|  |  |  |  | *2) Submersibles belonging to NTT-WE Marine* | | | |  |  |  | |
| ***Plough-type 7 Submarine cable burying system*** | 21 | 9.1 | 5.1 | 6.0 | – | Up to 2.0 m depth immediate burial of cable on ploughing | Towed by support ship | 1500 |  | Simultaneous or post-lay burial of cable. | |
| ***CARBIS-II***  ***ROV system*** | 8.0 | 3.2 | 2.1 | 2.8 | Water jetting | Trenching capability 1.5 m | Vertical and horizontal thrusters | 2500 |  | Cable detection & inspection visual survey. Cable manipulation & cutting. Cable & repeater burial. | |
| ***MAKO,***  ***ROV system***  ***(C/S VEGA)*** | 8 | 3.8 | 2.5 | 2.9 | Water jetting | Trenching capability 1.5 m | Vertical and horizontal thrusters | 2000 |  | Cable detection & inspection visual survey.  Cable manipulation & cutting.  Cable & repeater burial. | |
|  |  |  |  | **SPAIN** *1) Submersibles belonging to Tyco Submarine Systems Ltd.* | | | |  |  |  | |
| ***ARADO I*** | 12 | 9 | 4.6 | 4 | Plow-share | 1100 mm | Towed | 1500 |  | Bury cable from 19 to 40 mm. Bury repeaters until 380 mm. Velocity 1 m/s. | |
| ***NEREUS*** | 8.5 | 3.2 | 3.4 | 2.9 |  | 1 m | 150 kW | 2000 |  | Repair, inspect and bury all types of telephone cable 2 × manipulating 7 functions. Velocity 3 knots. | |
|  |  |  |  | **UNITED STATES OF AMERICA** *Submersibles belonging to Tyco Submarine Systems Ltd.* | | | |  |  |  | |
| ***PACIFIC SCARAB I*** | 5.48 | 4.27 | 1.83 | 3.05 | Jetting modules | 560 metres/hour. Soil hardness to  100 kPa. | 150 HP Electro-hydraulically powered using 8 thrusters | 2500 |  | PACIFIC SCARAB I Submersible Craft Assisting Repair and Burial is a tethered, swimming ROV capable of operating at depths of 2500 metres. It can locate, inspect, retrieve, and bury submarine cables. | |
| ***SCARAB II*** | 3.45 | 3.7 | 2.1 | 2.3 | 35 HP cable jetter | 255 m/hr depending on soil conditions. Soil hardness to  60 kPa. | Horizontal:  4 × 5 HP electric thrusters Vertical: 2 × 5 HP electric thrusters Aft lateral:  1 × 10 HP hydraulic thruster Bow: 2 × 2.5 HP hydraulic thrusters | 1850 |  | SCARAB II Submersible Craft Assisting Repair and Burial is a tethered, swimming ROV capable of operating at depths of 1850 metres. It can locate, inspect, retrieve, and bury submarine cables. |
| ***SCARAB IV*** | 4.6 | 3.4 | 2.02 | 1.96 | Jetting modules | 530 metres/hour Soil hardness to  100 kPa | 150 HP electro-hydraulically powered using 8 thrusters | 1850 |  | SCARAB IV Submersible Craft Assisting Repair and Burial is a tethered, swimming ROV capable of operating at depths of 1850 metres. It can locate, inspect, retrieve, and bury submarine cables. SCARAB IV is part of the ACMA SCARAB Agreement. |
| ***Sea Plow VI*** | 25.5 | 10.5 | 6.0 | 4.3 | Towed plow system | 1.2 metre burial | Towed by ship | 1000 |  | Sea Plow VI is a towed burial tool employing state-of-the-art burial features. It can achieve 1.2 metre burial depth in up to 1000 metre water depth. |
| ***Sea Plow VII*** | 14.0 | 10.5 | 6.0 | 4.3 | Towed plow system | 1.0 metre burial | Towed by ship.  1 thruster for launches and recoveries | 1400 |  | Sea Plow VII is a towed burial tool employing state-of-the-art burial features. It can achieve 1.0 metre burial depth in up to 1400 metre water depth. |
| ***Sea Plow VIII*** | 19.3 | 9.2 | 5.5 | 3.6 | Towed plow system with water jet assist | 1.5 metre burial | Towed by ship | 1500 |  | Sea Plow VIII is a towed burial tool employing state-of-the-art burial features. It can achieve 1.5 metre burial depth in up to 1500 metre water depth. |
|  |  |  |  | **UNITED ARAB EMIRATES** *Submersibles belonging to E-marine PJSC* | | | |  |  |  |
| ***SMD Plough*** | 15  12 (Submer-ged) | 9  9.8 (Max) | 4.6 | 4.5 | Plough share | 1.5 metre | Towrope from surface vessel | 2000 | 50 | Cables from 17 mm to 150 mm diameter. Repeaters up to 380 mm diameter. |
| ***Olympian T2***  ***ROV*** | 10.1 (Skid)  10.9 (With tracks) | 5.2 | 2.3 (Skid)  3.8 (Track) | 2.9 | Jet burial tool config. | 1 metre cohesive seabed  2 metre non-cohesive seabed | Hydraulic thrusters/tracks | 3000 | 1 | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
| ***SMD ROV*** | 8 (Skid)  9.2 (With track) | 3.8 | 3.2 (Skid)  3.7 (Tracks) | 2.7 | Jet burial tool config. | 0-1 metre | Hydraulic thrusters/tracks | 2000 | 1 | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
| ***Navajo ROV*** | 0.042 | 1.052 | 0.628 | 0.411 | NA | NA | DC brushless thrusters | 300 | Power supply 115 VAC/26A  230  VAC/13A | High quality video & sonar surveys. Capable of carrying buoyant work skids and manipulators. |
|  |  |  |  | **REPUBLIC OF KOREA** *Submersibles belonging to KT Submarine* | | | |  |  |  |
| ***ROV*** | 18 | 5.5 | 3.7 | 3.2 |  | 3 M | 800 HP | 2500 |  |  |
| ***Plough*** | 16 | 9.0 | 4.1 | 4.6 | – | 1.5 M | – | 1500 |  |  |

ANNEX 2

Questionnaire on new cable ships and submersible equipment

<Cable ships>

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Country | | |  |  |
| Organization | | |  |  |
| Name of ship | | |  |  |
| Year of construction | | |  |  |
| Displacement | | |  | (tons) |
| Overall length | | |  | (m) |
| Draft | | |  | (m) |
| Normal speed | | |  | (knots) |
| Range (autonomy) | | |  | (nautical miles) |
| Number of tanks | | |  |  |
| Cable capability | Cable | Cubic metres |  | (m3) |
| Weight |  | (tons) |
| Repeaters |  |  |  |
| Cable gear | Cable engine | (Drum) |  | (number) x (diameter) |
| (Linear) |  | (pairs of wheels) |
| Unwinding pulley | Bow sheave |  | (diameter, m) |
| Stern sheave |  | (diameter, m) |
| Maximum operating depth | | |  | (m) |
| Capability (general features and remarks) | | | | |
|  | | | | |

|  |  |
| --- | --- |
| Contact: |  |
| Affiliation: |  |
| Tel: |  |
| Fax: |  |
| E-mail: |  |

<Submersible equipment for laying, burial, inspection and so on>

|  |  |  |
| --- | --- | --- |
| Country |  |  |
| Organization |  |  |
| Type of submersible |  |  |
| Weight |  | (tons) |
| Overall length |  | (m) |
| Width |  | (m) |
| Height |  | (m) |
| Trenching system |  |  |
| Trenching capability |  |  |
| Propulsion |  |  |
| Maximum operating depth |  | (m) |
| Capability (general features and remarks) | | |
|  | | |

|  |  |
| --- | --- |
| Contact: |  |
| Affiliation: |  |
| Tel: |  |
| Fax: |  |
| E-mail: |  |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_