|  |  |
| --- | --- |
| The International Teleocmmunication Union - Connecting the World. | **Union internationale des télécommunications****Bureau de la Normalisation des Télécommunications** |
|  |  | Genève, le 22 mai 2023 |
| **Réf.:** | **Circulaire TSB 105** | - Aux administrations des États Membres de l'Union;- Aux Membres du Secteur UIT-T;- Aux Associés de l'UIT-T;- Aux établissements universitaires participant aux travaux de l'UIT-T**Copie:**- Aux Présidents et Vice-Présidents des commissions d'études;- Au Directeur du Bureau de développement des télécommunications;- Au Directeur du Bureau des radiocommunications |
| **Tél.:** | +41 22 730 6356 |
| **Télécopie:** | +41 22 730 5853 |
| **Courriel:** | tsbsg15@itu.int |
| **Objet:** | **Questionnaire sur les navires câbliers et les équipements submersibles** |

Madame, Monsieur,

1 À sa dernière réunion (Genève, 17-28 avril 2023), la Commission d'études 15 (CE 15) a décidé, dans le cadre des études effectuées au titre de la Question 8/15 (Caractéristiques des systèmes de transmission par câble sous-marin à fibres optiques), de réviser la Recommandation UIT-T G.971 (Caractéristiques générales des systèmes de câbles optiques sous‑marins) et de mettre à jour l'Appendice I existant, dans lequel figurent des données sur les navires câbliers et les équipements submersibles.

2 Il est prévu de soumettre la Recommandation G.971 révisée pour consentement à la réunion de la CE 15 en **2024**.

3 À cette fin, nous comptons sur votre concours pour revoir et mettre à jour les informations contenues actuellement dans l'Appendice I de la Recommandation G.971. Nous vous invitons donc à modifier, si nécessaire, les données existantes sur les navires câbliers et les équipements submersibles figurant dans l'**Annexe 1** de la présente Lettre circulaire, dans laquelle figure le texte de l'Appendice I de la Recommandation G.971.

Si des équipements figurant sur la liste ont déjà été mis au rebut ou si de nouveaux navires câbliers et équipements submersibles ont été construits depuis 2019, nous vous prions de bien vouloir les décrire (en anglais) en remplissant le Questionnaire de l'**Annexe 2**.

4 Vous voudrez bien renvoyer ces informations à l'éditeur de la Recommandation G.971 avant le **29 septembre 2023**:

Yuto Sagae
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5 Je compte sur votre coopération pour veiller à ce que vos réponses soient aussi précises que possible et parviennent à l'éditeur susmentionné avant l'échéance fixée.

Veuillez agréer, Madame, Monsieur, l'assurance de ma considération distinguée.

*(signé)*

Seizo Onoe
Directeur du Bureau de la normalisation
des télécommunications

**Annexes:** 2

**ANNEX 1**
**Data on cable ships and submersible equipment of various countries**

**I.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)** |
|  |  |  |  |  |  |  | **CHINA***1) Ship belonging to* *China Submarine Cable Construction Co.,Ltd.* |  |  |  |  |  |
| ***Feng Yang Hai Gong*** | 2010 | 1916.5 | 57.6 | 2.6 | 10 | - | 1 | 350 | 800 | 3 | - | 10 | - | - | 2000 | FYHG is capable of deploying a 5 m sea plough within WD200 m. |
|  |  |  |  |  |  |  | *2) Ships belonging to S.B.Submarine Systems Ltd.* |  |  |  |  |  |
| ***CS Fu Hai*** | 2000 | 9850 | 105.8 | 12.0 | 12.5 | 45 days | 2 tanks2 hold | 2736.8548 | 52001042 | 96 | 3.0 | 20 | - | 2 ×3.0 | All | Laying and repair optical fibre systems. |
| ***Bold Maverick*** | 2001 | 9850 | 105.8 | 12.0 | 12.5 | 45 days | 2 tanks2 hold | 2736.8548 | 52001042 | 96 | 3.0 | 20 | - | 2 ×3.0 | All | Laying and repair optical fibre systems. |
| ***CS Fu An*** | 1982 | 10380 | 141.5 | 11.6 | 12.0 | 38 days | 3 tanks1 hold | 1200120 | 2394309 | 35 | 2 x 3.0 | - | - | 2 ×3.0 | All | Laying and repair optical fibre systems. |
|  |  |  |  |  |  |  | **DENMARK***Ships belonging to Tele Denmark* |  |  |  |  |  |
| ***Peter Faber*** | 1982 | 3680 | 78.35 | Ice3.8Summer5.0 | 13.0 | 7000 | 1 tank1 hold | 310230 | 600400 | 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 tonne. |
|  |  |  |  |  |  |  | **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-cation1999 | 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*** | 1983rebuilt2002 | 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. |
| ***Antonio Meucci***  | 1987 | 7900 | 114 | 6.5 | 12.0 | 10 000 | 3 | 1500 | 2600 | 80 | 2 × 3.5 | 12 | 3 | 3 | All | Laying and repair optical fibre systems. |
|  |  |  |  |  |  |  | *2) Ship 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. |
|  |  |  |  |  |  |  | **JAPAN***1) Ships belonging to Kokusai Cable Ship (KCS)* |  |  |  |  |
| ***KDDIOceanLink*** | 1992 | 11'700 | 133.2 | 7.0 | 15 | 10'000 | Main 3Spare 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 Cable Infinity*** | 2019 | TBA | 113.1 | 7.1 | 12 | 10'000 | Main 2Spare 2 | 2070 | 4500 | 70 | 4.0 | – | – | 4.0 | All | Laying and repair of all types of telecom cables. Laying of power cables. |
|  |  |  |  |  |  |  | *2) Ships belonging to NTT World EngineeringMarine Corporation (NTT-WE Marine)* |  |  |  |  |
| ***CS Subaru*** | 1999 | 9557 | 123.3 | 7.0 | 13.2 | 8800 | Main 2Spare 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 | N/A | 2.5 | N/A | All | Lays and repairs for non-powered telephone cable system.DP, ROV system. |
| ***ORION*** | 2013 | 299 | 54.9 | 3.4 | 10.0 | 3708 | 2 | 100 | 200 | N/A | 2.5 | N/A | N/A | 2.5 | 500 | Domestic maintenance purpose. |
| ***KIZUNA*** | 2017 | 8598 | 108.64 | 6.014 | 13.8 | 9500 | Main 2Spare 2 | 1984.18 | 2184.03 | 0 | 3.6 | N/A | N/A | 2.5 | All |  |
|  |  |  |  |  |  |  | **UNITED KINGDOM***1) Ship 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.) |
|  |  |  |  |  |  |  | *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. |
| ***PacificGuardian*** | 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. |
|  |  |  |  |  |  |  | *3) Ship 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***1) Ship belonging to TE CONNECTIVITY SUBCOM, SLU.* |  |  |  |  |
| ***Teneo*** | 1992 | 4000 | 81 | 5.7 | 13 | 4200 | 2 | 435 | 1000 | 20 | 2 × 3.5 | 1 × 9 | 2 × 3 | 1 × 3 | All | Lays and repairs of all types of telephone cables. |
|  |  |  |  |  |  |  | *2) Ship belonging to CS Tyco Decisive, Inc.* |  |  |  |  |
| ***CS Decisive*** | 2003 | 16148 | 140 | 8.4 | 13.9 | 25000 | 3 Main | 1138.6 | 8841 |  | 2 x ODIM 4.0 | ODIM 20pair | - | 30T 0.6m2x 50T 1.1580T .046 | - | The Decisive is capable of deploying SubCom's ROVs; Triton STs and SMD Nereus and SubCom's 3 m ploughs up to 80T bollard pull. |
|  |  |  |  |  |  |  | *3) Ship belonging to CS Tyco Dependable, Inc.* |  |  |  |  |
| ***CS Dependable*** | 2002 | 16148 | 139.1 | 8.4 | 13.9 | 25000 | 3 Main | 1138.6 | 8841 |  | 2 x ODIM 4.0 | ODIM 20pair | - | 30T 0.6m2x 50T 1.1580T .046 | - | The Dependable is capable of deploying SubCom's ROVs; Triton STs and SMD Nereus and SubCom's 3 m ploughs up to 80T bollard pull. |
|  |  |  |  |  |  |  | *4) Ship belonging to CS Tyco Durable, Inc.* |  |  |  |  |
| ***CS Durable*** | 2003 | 16148 | 139.1 | 8.4 | 13.9 | 25000 | 3 Main | 1138.6 | 8841 |  | 2 x ODIM 4.0 | ODIM 20pair | - | 30T 0.6m2x 50T 1.1580T .046 | - | The Durable is capable of deploying SubCom's ROVs; Triton STs and SMD Nereus and SubCom's 3 m ploughs up to 80T bollard pull. |
|  |  |  |  |  |  |  | *5) Ship belonging to CS Tyco Reliance, Inc.* |  |  |  |  |
| ***CS Reliance*** | 2001 | 16148 | 140 | 8..4 | 13.9 | 25000 | 3 Main | 1138.6 | 8841 |  | 2 x ODIM 4.0 | ODIM 20pair | - | 30T 0.6m2x 50T 1.1580T .046 | - | The Reliance is capable of deploying SubCom's ROVs; Triton STs and SMD Nereus and SubCom's 3 m ploughs up to 80T bollard pull. |
|  |  |  |  |  |  |  | *6) Ship belonging to CS Tyco Resolute, Inc.* |  |  |  |  |
| ***CS Resolute*** | 2002 | 16148 | 140 | 8.4 | 13.9 | 25000 | 3 Main | 1138.6 | 8841 |  | 2 x ODIM 4.0 | ODIM 20pair | - | 30T 0.6m2x 50T 1.1580T .046 | - | The Resolute is capable of deploying SubCom's ROVs; Triton STs and SMD Nereus and SubCom's 3 m ploughs up to 80T bollard pull. |
|  |  |  |  |  |  |  | *7) Ship belonging to CS Tyco Responder, Inc.* |  |  |  |  |
| ***CS Responder*** | 2001 | 16148 | 140 | 8.4 | 13.9 | 25000 | 3 Main | 1138.6 | 8841 |  | 2 x ODIM 4.0 | ODIM 20pair | - | 30T 0.6m2x 50T 1.1580T .046 | - |  |
|  |  |  |  |  |  |  | **UNITED STATES OF AMERICA***Ship belonging to Transceanic Cable Ship Company, LLC.* |  |  |  |  |
| ***CS Global Sentinel*** | 1991 | 16118 | 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 TRITON ST ROVs, as well as SMD 1.5 m sea ploughs. |
|  |  |  |  |  |  |  | **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 main4 spare | 3258 | 6098 | 152 | 4 | 18 | 4 | 4 | Unlimited | Surface lay, plough burial, maintenance, work class ROV inspection and jet burial. |
| ***CS UAA*** | 1972Conver-ted in 1996 | 7800 | 133.7 | 6.15 | 13 | 48 days | 3 main1 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 |  |  |
| ***Responder*** | 2000 | 8071 | 105.5 | 9.1 | 12.5 | – | 4 | 4790 | 6000 | – | – | – | – | – | – |  |
|  |  |  |  |  |  |  | **MALTA** *1) Ship belonging to J. Ray Mcdermott (Norway) AS Of Oslo Norway (as registered owner)* |  |  |  |  |
| ***NORTH OCEAN 102*** | 2008 | 11680 Gross Tons | 118.97 (length according to Article 2(8) of the International Tonnage Convention | Moulded Draught (Reg 4(2)6.70 | 15 | Not known (N/K) | N/K | N/K | N/K | N/K | N/K | N/K | N/K | N/K | N/K | -- |
|  |  |  |  |  |  |  | *2) Ship belonging to Oceanteam Bourbon 4 AS, Tveitarasveien 12, 5232 Paradis Bergen 1201, Norway* |  |  |  |  |
| ***SOUTHERN OCEAN*** | 2010 | 11014 | 119.07 | 6.85 | 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
|  |  |  |  |  |  |  | *3) Ship belonging to Oceanteam Bourbon 101 AS, Tveitarasveien 12, 5232 Paradis Bergen 1201, Norway* |  |  |  |  |
| ***BOURBON OCEANTEAM 101*** | 2007 | 8575 | 106.20 | 5.50 | 15 | – | – | – | – | – | – | – | – | – | – |  |
|  |  |  |  |  |  |  | *4) Prysmian Powerlink Services Limited, Chickenhall Lane, Eastleigh, Hampshire SO506YU, United Kingdom* |  |  |  |  |
| ***ULISSE*** | 2010 | 10490 | 115.23 | 5.33 | – | – | – | – | – | – | – | – | – | – | – |  |

**I.2** **Submersible equipment**

Various types of submersible equipment are used to support the installation and maintenance of an optical submarine cable system. Typical examples of submersible equipment include a plough and a remotely operated vehicle (ROV).

A plough is towed by a cable ship and is used to lay the optical submarine cable while burying it.

An ROV is used when a plough is not available. A submersible craft assisting repair and burial (SCARAB) is a type of ROV. ROVs typically enable inspection, repair, and burial.

| **Type ofsubmersible** | **Weight(tons)** | **Overalllength(m)** | **Width(m)** | **Height(m)** | **Trenchingsystem** | **Trenching** | **Propulsion** | **Max operatingdepth(m)** | **Max pulling tension (tons)** | **Capability** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **CHINA***1) Submersible belonging to China Submarine Cable Construction Co.,Ltd.* |  |  |  |
| ***SHARK-600 Submersible Plough system*** | 12 | 11.01 | 4.42 | 2 | Water jet tool | Max burial depth: 5m | Towed | 200 | 25T | Lay and bury all types of cables. |
|  |  |  |  | *2) Submersibles belonging to S.B. Submarine Systems Ltd.* |  |  |  |
| ***SMD MD3*** | 25 | 10.3 | 5.1 | 4.7 | Articulated towed plough system  | 3 m | Towed by ship | 1500 | 80T |  |
| ***SMD Hi- Plough*** | 27 | 10.3 | 5.1 | 7.5 | Injecting/Jetting | Up to 3.25 m | Towed by ship | 200 | 20 T |  |
| ***ROV SEA LION*** | 6.5 | 3.2 | 2.9 | 2.9 | Jet burial tool | 1.5 m | Hydraulic Thrusters &/or tracks | 2500 | 200HP | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
| ***ROV SEA LION III*** | Free Fly17.25Tracked18.4 | 6.5 | Free Fly3.7Tracked5.2 | 3.1 | Jet burial tool | 3.0 m | Hydraulic Thrusters &/or tracks | 2500 | 600HP | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
|  |  |  |  | **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-advancingburied systemCASTOR2*** | 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. |
| ***Remote control submersibleScorpio 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***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 cableand 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 two manipulators with line cutters. |
| ***Plough2 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 burialThrusters survey | 1000 (burial) 2000 (survey) |  | Tools include cable cutter, cable gripper and two manipulators with line cutters. |
| ***Underwater vehicle- MARLIN*** | 7.8 | 4.191 | 2.438 | 3.175 | Burial skid | To 1.0 m(Optimized for0-30 kPa soil) | Hydraulic driven thrusters | 2500 |  | Burial, deburial, inspection.Maintenance and repair.Tools include cable cutter, cable gripper. |
| ***Scarab I – Umbilically tethered ROV*** | 3.2 | 2.74 | 1.82 | 1.52 | Jetting tool | Up to 0.6 m | Thrusters:2 vertical4 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 toolRock wheel cutterMechanical chain excavator | 1 m1.2 m2.2 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 from0-1100 mm(600-900 mmin 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 burialdepth:1100 mm | Towed | 1000 |  | Simultaneously lay and bury cables and umbilicals at varying depths. |
| ***Cable Plough1000 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 from0-1100 mm(600-900 mmin all conditions) | Towed bysurface 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. |
| ***Super Phantom S4-ROV*** | 0.09 | 1.5 | 0.75 | 0.6 | – | – | Thrusters4 prop fwd/aft2 prop vertical2 prop transverse | 300 |  | Inspect cables and other underwater objects. Can also be used to inspect seabed conditions. |
|  |  |  |  | **JAPAN***1) Submersibles belonging to KCS* |  |  |  |
| ***MARCAS-IV-ROV*** | Jet tool mode: 17.0 | 6.5 | Jet tool mode: 3.65 | Jet tool mode: 3.0 | Water jet tool | Up to 3.0 m | 4 horizontal, 4 vertical and 2 lateral thrusters | 2500 |  | Post-lay burial, maintenance of cable. Can survey seabed. |
| ***MARCAS-V-ROV*** | Jet tool mode: 8.7Track mode: 9.3 | 5.4 | Jet tool mode: 3.0Track mode: 3.1 | Jet tool mode: 2.1Track mode: 2.7 | Water jet tool | Up to 2.0 m | 4 horizontal, and 4 vertical | 3000 |  | Post-lay burial, maintenance of cable.Can survey seabed. |
| ***PLOW-II*** | 18.5Jet tool mode: 20.0 | 9.5 | 5.6 | 5.0 | Plough shareWater jet tool | Up to 3.0 m | Towed by cable ship | 1500 | 80 | Simultaneously lay and bury cables and umbilicals at varying depth. |
|  |  |  |  | *2) Submersibles belonging to NTT-WE Marine* |  |  |  |
| ***Plough-type 7Submarine 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******(C/S VEGA)*** | 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. |
| ***CARBIS-III******ROV system******(C.S Subaru)*** | 9.0 | 3 | 3.4 | 2.1 | Water jetting | Trenching capability 3.0 m | Vertical and horizontal thrusters | 2000 |  | Cable detection & inspection visual survey.Cable manipulation & cutting.Cable & repeater burial. |
| ***CABRIS-IV ROV system (KIZUNA)*** | 7.4 | 3.6 | 2.2 | 3.3 | Water jetting | Trenching capability 1.5 m | Vertical and horizontal thrusters | 2500 |  | Cable detection & inspection visual survey.Cable manipulation & cutting.Cable & repeater burial. |
|  |  |  |  | **UNITED STATES OF AMERICA***Submersibles belonging to TE CONNECTIVITY SUBCOM, SLU.* |  |  |  |
| ***Arado 1*** | 14.0 | 10.5 | 6.0 | 4.3 | Towed plough system | 1.5 m burial | Towed by ship. 1 thruster for launches and recoveries | 1400 |  | ARADO 1 is a towed burial tool employing state-of-the-art burial features. It can achieve 1.5 m burial depth in up to 1 400 m water depth. |
| ***SMD MD3*** | 25 | 9.3 | 5.0 | 4.4 | Articulated towed plough system  | 3 m | Towed by ship | 1500 | 80T |  |
| ***SMD MD3 DF*** | 25 | 9.3 | 5.0 | 4.4 | Articulated towed plough system  | 3 m | Towed by ship | 1500 | 80T |  |
| ***SeaStallion 1*** | 32 | 13.8 | 5.4 | 5.3 | Towed plough system | 3 m | Towed by ship | 2000 | 100T |  |
| ***SeaStallion 2*** | 32 | 13.8 | 5.4 | 5.3 | Towed plough system | 3 m | Towed by ship | 2000 | 100T |  |
| ***SeaStallion 3*** | 32 | 13.8 | 5.4 | 5.3 | Towed plough system | 3 m | Towed by ship | 2000 | 100T |  |
| ***SeaStallion 4*** | 32 | 13.8 | 5.4 | 5.3 | Towed plough system | 3 m | Towed by ship | 2000 | 100T |  |
| ***SeaStallion SEP*** | 12 | 8.0 | 4.2 | 4.0 | Towed plough system | 2 m | Towed by ship | 1000 | 50 | Sea Stallion SEP is a dedicated Shore End Plough. |
| ***SMD QT800*** | 21 (free fly) 22 (tracked) | 5.4 | 4.6 | 3.3 | Jet burial tool | 3 m | Hydraulic Thrusters &/or tracks | 2500 | 800HP | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
| ***Triton ST213 ROV*** | 6.3 (free fly) 7.0 (tracked) | 3.1 | 2.0 | 2.2 | Jet burial tool | 1.5 m2 m optional | Hydraulic Thrusters &/or tracks | 2500 | 200HP | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
| ***Triton ST214 ROV*** | 6.3 (free fly) 7.0 (tracked) | 3.1 | 2.0 | 2.2 | Jet burial tool | 1.5 m2 m optional | Hydraulic Thrusters &/or tracks | 2500 | 200HP | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
| ***Triton ST215 ROV*** | 6.3 (free fly) 7.0 (tracked) | 3.1 | 2.0 | 2.2 | Jet burial tool | 1.5 m2 m optional | Hydraulic Thrusters &/or tracks | 2500 | 200HP | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
| ***Triton ST216 ROV*** | 6.3 (free fly) 7.0 (tracked) | 3.1 | 2.0 | 2.2 | Jet burial tool | 1.5 m2 m optional | Hydraulic Thrusters &/or tracks | 2500 | 200HP | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
| ***Triton ST273 ROV*** | 6.3 (free fly) 7.0 (tracked) | 3.1 | 2.0 | 2.2 | Jet burial tool | 1.5 m2 m optional | Hydraulic Thrusters &/or tracks | 2500 | 200HP | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
| ***Triton ST218 ROV*** | 6.3 (free fly) 7.0 (tracked) | 3.1 | 2.0 | 2.2 | Jet burial tool | 1.5 m2 m optional | Hydraulic Thrusters &/or tracks | 2500 | 200HP | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
| ***SMD Nereus 3 ROV*** | 8.3 (free fly) 9.5 (tracked) | 3.8 | 3.2 | 2.5 | Jet burial tool | 2 m | Hydraulic Thrusters &/or tracks | 2500 | 300kW | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
| ***SMD Nereus 4 ROV*** | 8.3 (free fly) 9.5 (tracked) | 3.8 | 3.2 | 2.5 | Jet burial tool | 2 m | Hydraulic Thrusters &/or tracks | 2500 | 300kW | Cable burial and deburial. Inspect cables, seabed and underwater objects. 7-function 2-manipulation cutting and grip. |
|  |  |  |  | **UNITED ARAB EMIRATES***Submersibles belonging to E-marine PJSC* |  |  |  |
| ***SMD Plough*** | 1512 (Submer-ged) | 99.8 (Max) | 4.6 | 4.5 | Plough share | 1.5 m | 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 m cohesive seabed2 m 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 m | 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/26A230VAC/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 |  |  |
| ***Burial*** | 19 | 5322 | 4183 | 2977 | – | – | 300 HP | 2500 | – |  |

**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) |
|  |

|  |  |
| --- | --- |
| ContactAffiliationTelFaxE-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) |
|  |

|  |  |
| --- | --- |
| ContactAffiliationTelFaxE-mail |  |

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