TELECOM REGULATORY AUTHORITY OF INDIA

Recommendations

on

Licensing Framework and Regulatory Mechanism for Submarine Cable Landing in India

19th June 2023

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CHAPTER 1

Introduction

A- Submarine Communication Cables

1.1 Submarine Communication Cables laid on the seabed, are the pivotal assets of fast paced digital global economy and are the lifelines of any country's communication grid empowering its business and economic operations. The United Nations General Assembly (UNGA) in 2010 had described Submarine cable as "critical communication infrastructure". The web of submarine communication cables traverses the maritime zones of several countries connecting people and businesses across the globe. Today, these international cables carry around 99% percent of the world's international Internet traffic. With the changing dynamics of geopolitics situation, these critical infrastructures are new strategic assets in the ocean that could be vital for any nation.

B- Global trends in Submarine Cable System

1.2 The Tele Geography Submarine Cable (SMC) Map 2022 depicts 486 cable systems worldwide spanning across a total distance of over 1.3 million kilometers and 1,306 landings that are currently active or under construction[1]. The period 2017-2021 saw an average of 50,000 kms submarine cable added annually[2]. A large length of submarine cables was added in 2018 and 2020 with a total of 76,000 kms and 56,000 kms respectively. Post COVID pandemic, with many activities like work, entertainment, education etc going online, there has been a large surge in data usage. This trend is likely to further boost the laying of SMCs across the globe.

[1] https://blog.telegeography.com/two-new-maps-lots-of-new-cables
[2] https://subtelforum.com/submarine-telecoms-industry-report-10th-anniversary-issue-now-available/

1.3 A time of five to seven years is generally required between the first planning of a new cable and the cable actually becoming ready for service (RFS). It involves a multi-million-dollar capital investment which depends on the length of the planned cable. A new trans-Atlantic subsea cable currently costs $200millions to $250millions to build. As a rough approximation, a typical submarine cable can be built at a cost of~$40,000 per mile, which is equivalent to ~$25,000 per kilometer[3].

1.4 The world continues to consume ever-increasing amounts of data, with an international bandwidth demand projected to almost double every two years for the foreseeable future[4]. This demand is driven by a continued shift towards cloud services, continued explosion of mobile device usage and use of latest mobile technology like 4G/5G. Content providers' international bandwidth growth has outpaced that of all other customers in recent years. By 2017, content providers had surpassed internet backbone providers as the largest users of international capacity[5]. Content providers such as Google, Meta, Amazon, and Microsoft are significant drivers of capacity demand across the globe. These companies have moved beyond being mere capacity purchasers to becoming cable owners. The new SMC systems are guided by new innovations, including new transmission technology to handle higher capacity wavelengths, increased fibre counts for more overall system capacity, and streamlined network management. A noticeable trend in global networks is the increasing importance of route diversity and more direct control over critical infrastructure. Submarine cables have grown from four pairs in the early 2000's up to 24 fibre pairs and are expected to be even more in near future. Also, Over the past few decades, due to technological advancement, capacity on new

[3] Submarine Cables: the Invisible Fibre Link Enabling the Internet - Dgtl Infra
[4] https://issuu.com/subtelforum/docs/submarine_telecoms_industry_report_issue_10
[5] https://blog.telegeography.com/two-new-maps-lots-of-new-cables

submarine cable systems has increased from hundreds of megabits per second (Mbps) of capacity, to systems with hundreds of Terabits per second (Tbps) of capacity, at present. In the new generation submarine cable, each of the owners of a cable/ member in consortium can now own one or multiple fibre pairs. Thus, the industry, which was once dominated by traditional players, has undergone a drastic transformation in the last few years.

1.5 The internet traffic in India has grown multiple times in line with the global trends. This exponential increase in demand for internet services has led to a corresponding and unprecedented surge in the international traffic flowing through submarine cables. This traffic is expected to multiply even further with the widespread adoption of 5G technology and a further proliferation of data centers in India. To cater to this growing demand, submarine cable capacity will need to be increased proportionately.

C- Reference from DoT

1.6 DoT has been issuing ILD licenses from 2002 onwards and ILD licensees, with prior approval of DoT, are authorized to set up their Cable Landing Stations (CLS) and to lay submarine cables in India.

1.7 Recently, DoT noted that in some cases, the Indian ILDOs do not have any stake in the consortium owning submarine cable, but they are seeking MHA/ MoD clearance on behalf of the cable consortiums for laying/maintaining such cables and applying for setting up of CLS for such submarine cables. They are acting as the landing party in India for these cables. The following directions were issued by DoT: -

a. *The company laying submarine cables have to ensure that it holds a valid ILD license issued by the Department of Telecommunications, Government of India while entering into the Indian territorial waters.*

In case a consortium is laying submarine cables, they shall ensure that any member of their consortium holds a valid ILD license issued by Department of Telecommunications, Government of India while entering into the Indian territorial waters.

b. *The ILD licensees, licensed in India, while applying for security clearances (i.e MHA/ MoD Clearance) on behalf of any entity for laying/maintaining the submarine cables, shall make sure that they have significant stake in such entities on behalf of whom they are applying for security clearances. else they won't have any locus standi in the case.*

1.8 After issuance of these instructions, some of the ILDOs have started claiming that the portion of submarine cable laying in Indian territorial waters is being owned by them. On further enquiry by CS wing, they submitted copies of agreements signed by them with consortium members and also copies of asset registers were also sought from ILDOs. The clearances were issued to ILDOs by CS wing, DoT due to the urgent maintenance requirements and based on the statements of ILDOs that they own these assets in Indian territorial waters.

1.9 DoT has stated that though the ILDOs have undertaken that they own the assets in the Indian territorial waters, however, concerns are being raised by the industry that enforcing stake condition in submarine cables can put the country on disadvantageous position for international connectivity and have urged DoT not to mandate this condition.

1.10 DoT vide reference letter dated 12th August 2022 (Annexure-I) has requested TRAI for recommendations on licensing framework and mechanism for submarine cables landing in India within existing UL-ILD/ standalone ILD license under section 11(1)(a) of TRAI Act

1997. It is also requested to examine global practices adopted by other countries for regulating submarine cables landing in their countries/ territorial water while giving these recommendations.

D- Other issues identified related to submarine cables in India.

1.11 The Authority *suo-moto* has taken notice of following other issues related to submarine cables: -

a. The need and feasibility of Indian Flagged Cable repair vessel for carrying out operation and maintenance smoothly in time-efficient manner of submarine cables.

b. The challenges associated with the deployment of domestic submarine cable and the ways to overcome them in order to promote these cables in India. Domestic submarine cables can help enhance the digital connectivity and infrastructure of Tier-I and Tier-II cities situated along the Indian coastline.

c. The benefits and challenges involved in laying Stub-cables (a new concept of pre-laid open-ended "dark fibre" from the CLS through Beach Manhole (BMH) into the Indian Territorial Waters/ Exclusive Economic Zone (EEZ) for upcoming new cables).

d. Challenges being posed in establishing terrestrial connectivity between differently located Cable Landing Stations in India.

E- Present Consultation and recommendations

1.12 On points raised by DoT in its reference and on certain other issues (as detailed above) that the Authority had *suo-moto* identified, a Consultation Paper (CP) was issued on 23rd December 2022 to solicit stakeholders' views. Written comments and counter

comments on the consultation paper were invited from stakeholders by 20th January 2023 and 3rd February 2023. On the request of industry association/ stakeholders, the last date for submission of written comments and counter-comments was extended up to 10th and 24th February 2023 respectively. Comments and counter-comments received from various stakeholders have been uploaded on TRAI website. In this regard, an Open House Discussion (OHD) was conducted on 19th April 2023. Based on the written submission of the stakeholders, the discussions in the OHD and the Authority's own analysis, the issues have been examined, and these recommendations have been framed.

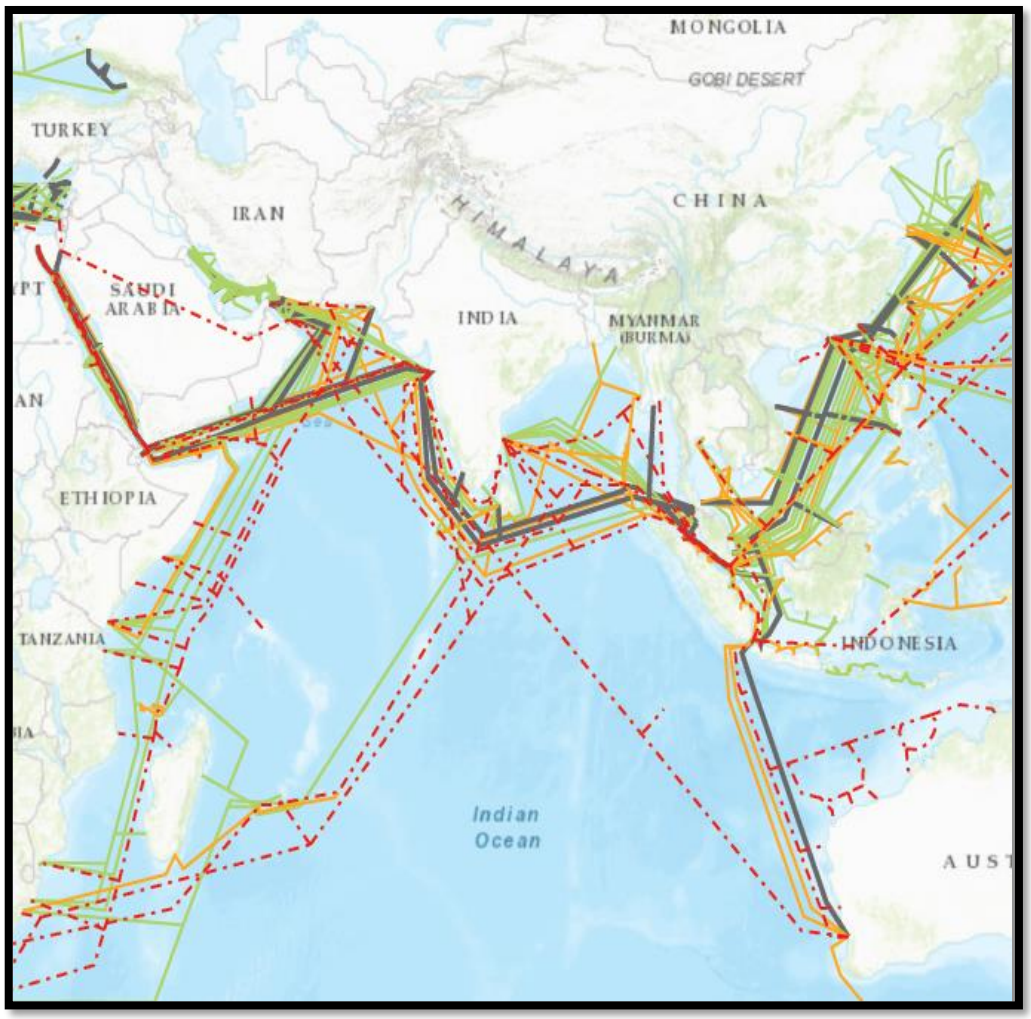
1.13 The recommendation is divided into four chapters. Chapter 1 briefly introduces the subject, background to the recommendation and details about the consultation process. Chapter 2 deals with the status of submarine cables in India and Indian Flagged Vessel for operation and maintenance of submarine cable. Chapter 3 discusses the additional issues related to Domestic submarine cable, stub-cable, and terrestrial connectivity. Chapter 4 summarizes all the recommendations.

CHAPTER 2

SUBMARINE CABLE AND CLS IN INDIA

A- Submarine Cables (SMC) in India

2.1 As of now, India has total 17 SMCs landing at the Cable Landing Stations (CLS) near the coastline to connect with the terrestrial network. Mumbai and Chennai have the maximum concentration of SMCs. Also, number of new SMCs that are under planning/construction, are going to make a landfall at the different coastal cities of the country including some new locations in India.



Submarine Cables around Indian Subcontinent [6]

[6] https://issuu.com/subtelforum/docs/submarine_telecoms_industry_report_issue_10

2.2 India's used international bandwidth is expected to grow at a compounded annual rate of 38% between 2021 and 2028. This rate of growth implies that international bandwidth demand will increase 10 times over this period[7]. India is experiencing an influx in its data centres due to its significant market potential and relaxed policies and regulatory environment. According to the data received from the owners of cable landing station, the total lit capacity and activated capacity (in Gbps) for last six years (tabulated below) shows that there is strong demand for submarine cables as there is no alternative to these vital digital infrastructures.

Table 2.1 – Total Lit and activated Capacity (in Gbps) on submarine cables in India.

Year	Total LIT Capacity on submarine cables landing in India. (as on 31st December of the year in Gbps)	Total Activated Capacity on submarine cables landing in India. (as on 31st December of the year in Gbps)	% LIT Capacity activated in the year end
2016	39,282	9,137	23.26%
2017	49,370	14,946	30.27%
2018	67,180	27,307	40.65%
2019	83,470	42,813	51.29%
2020	1,01,342	62,681	61.85%
2021	1,23,870	83,800	67.65%
2022	**1,38,606**	**1,11,111**	**80.16%**

[7] https://blog.telegeography.com/expectations-for-indias-used-international-bandwidth

B- Existing Licensing Framework in India

2.3 International Long-Distance Operators (ILDOs) licensees are allowed to set up Cable Landing Station (CLS) for landing Submarine cables. Relevant clauses of ILD license are as below: -

(i) Clause 2.6 Chapter XI of the Unified License (UL)

"The Licensee may establish Cable Landing Station (CLS) for submarine cable with prior permission of Licensor for which a separate application is to be submitted in the prescribed proforma. Access/ Co-location at the CLS shall be governed by the orders/regulations/directions issued by Licensor/ TRAI from time to time."

(ii) Clause 2.7 of Chapter XI of the Unified License (UL)

"Equal access to bottleneck facilities at the Cable Landing Stations (CLS) including landing facilities for submarine cables for licensed operators on the basis of non-discrimination shall be mandatory. The terms and conditions for such access provision and the charges for such access provision shall be governed by the regulations/ orders as may be made by the Licensor/TRAI from time to time."

2.4 The Internet Service Licensees under Unified license are also allowed to install operate and commission International Internet Gateway using submarine cable as medium. Relevant clause of Internet Service license is as below: -

Clause 2. (ix) of Chapter IX of the Unified License

"Licensee may install operate and commission International Internet Gateway in the service area ***using satellite or submarine cable as medium*** *after obtaining security clearance/approval from Licensor."*

C- TRAI's regulation on CLS in India

2.5 TRAI is regulating the access to essential facilities at a Submarine Cable Landing Station for accessing international capacity on the submarine cables terminating at various CLS in India. The provisions have been made to provide, on fair and non-discriminatory terms & conditions, access to any eligible Indian International Telecommunication Entity for accessing international submarine cable capacity on any submarine cable. As per existing licensing/ regulatory framework, both the owner of the cable landing station and seeker of international capacity at the CLS must have the valid ILD/ISP license, holding a valid international gateway permission from DoT. Also, Access Facilitation Charges and co-location charges are prescribed, which shall be payable by a class or classes of eligible Indian International Telecommunication Entity to the owner of the CLS. In this regard, TRAI has issued the following Regulations: -

(i) The International Telecommunication Access to Essential Facilities at Cable Landing Stations Regulations, 2007 (5 of 2007) dated 07.06.2007.

(ii) The International Telecommunication Access to Essential Facilities at Cable Landing Stations (Amendment) Regulations, 2012 (No. 21 of 2012) dated 19.10.2012.

(iii) The International Telecommunication Cable Landing Stations Access Facilitation Charges and Co-Location Charges Regulations, 2012 (No. 27 of 2012) dated 21.12.2012.

(iv) The International Telecommunication Cable Landing Stations Access Facilitation Charges and Co-Location Charges (Amendment) Regulations 2018 on 28.11.2018.

D- DoT reference – Issues related to laying and maintenance of submarine cables in India and setting up CLS.

2.6 DoT had issued guidelines and general information for Internet Service Providers (ISP) licensees for setting up of Submarine Cable Landing Stations for International Gateways for Internet[8]. However, these guidelines were issued prior to the Unified Licensing regime. Further, guidelines and / or general information for setting up CLS for submarine cable is not specifically available for ILD licensees. DoT is granting permission to eligible ILDO[9]/ ISP licensees to set up CLS for submarine cables in India.

2.7 DoT in its reference sent to TRAI, has noted that in some cases the Indian ILDOs do not have any stake in the consortium owning submarine cable, but they are seeking MHA/ MoD clearance on behalf of the cable consortiums for laying/maintaining such cables and applying for setting up of CLS for such submarine cables. They are acting as the landing party in India for these cables. DoT has stated that the ILDOs have undertaken that they own the assets in the Indian territorial waters. They have also raised concerns that enforcing stake condition in submarine cables can put the country at a disadvantage for international connectivity and have urged DoT not to mandate this condition.

2.8 The activities of submarine cable laying in India and its ownership/ stake condition for the eligible licensees are *not defined* under the scope of work / service for UL license or standalone ILD or ISP license. There is one clause 2.4 under condition 2(scope of the license) of Chapter -1 under UL[10] about *Licensee making its own arrangements for all infrastructure involved in providing the service*

[8] https://dot.gov.in/isplicense/guidelines-and-general-information-setting-submarine-cable-landing-stations-international

[9] ILDO – International Long Distance Operator

[10] https://dot.gov.in/unified-licencing?page=3

and shall be solely responsible for the installation, networking, operation and commissioning of necessary infrastructure, equipment, and systems, etc. However, the clause is silent on ownership/ stake condition aspects that are presently under contention as per reference of DoT. The question that arises is - whether the ILDOs seeking for laying/ maintaining the submarine cable in India, should also own and control the necessary inputs of that submarine cable system in India (cable in Indian territorial waters/EEZ of India), cable landing station and back haul facilities? As most submarine cables are laid as part of the consortium, therefore any individual player will have only a certain percentage as ownership in the system. For such ILDOs, those seek permission for terminating any submarine cable in India, should there be an insistence that they own a minimum of X% interest in the submarine cable system apart from owning the CLS in India?

2.9 Based on the above, following options for different conditions were put in the Para 2.10 of Consultation Paper that can be made applicable to ILDOs who are laying/ planning to lay submarine cable and setting-up CLS in India: -

(i) ILDOs should have X% or greater interest in the submarine cable system for laying cable in the Indian territorial waters, terminating the international cable and should also own or control the Cable Landing Station in India.

(ii) ILDOs not having any stake in consortium but signing agreement of ownership of submarine cable in Indian waters and submitting undertaking that they are owning the asset in Indian territorial waters.

(iii) Any ILDOs without ownership agreement/ undertaking.

2.10 The stakeholders were requested to give their comments on the following issues with justification: -

Q.1 What limitations are being posed by existing licensing and regulatory provisions for laying submarine cables and setting up of CLS in India? Please answer with the detailed justification for changes required, if any.

Q.2 Which of the conditions, as stated in Para 2.10 be made applicable on the ILD licensee for applying permission /security clearance for laying and maintaining the submarine cable and setting up CLS in India? Please answer with detailed justification.

Comments of the stakeholders

2.11 A few Stakeholders have requested that a review of existing definition of CLS is required in line with technology advancements. The stakeholders have stated that the new generation submarine cable systems have multiple fibre pairs (12-24) which are significantly higher from the cables that are currently functional in India. So, upcoming submarine cable system landing in India could have multiple ILDO's owning fibre pairs with one ILDO leading the engagement to land the system. Big players like CDN, Data Centers, OTT players would like to own end to end fibre pair rather than capacity in new submarine cable system. The current licensing framework requires setting up of a Cable Landing Station (CLS) including PFE (Power Feeding Equipment), SLTE (Submarine Line Terminal Equipment), LIM (Lawful Interception Monitoring) and other equipment at the same place. However, in new generation submarine cable systems, it is technically feasible to have PFE and SLTE at different locations for various fibre pairs.

2.12 Few Stakeholders have stated that as long as the SLTE and LIM are co-located, it does not matter where they are located, whether in CLS or data center PoP, and the SLTE and LIM for different fibre pairs of the same cable could be located in different data center PoPs. The

scope of the CLS should, therefore, be defined as the common point for landing the submarine cable in India and ILDOs be responsible for operationalizing their respective fibre pair(s) at their PoP and also demonstrate the Lawful Interception & Monitoring (LIM) capabilities individually at these PoPs.

2.13 Few stakeholders have opined that the regulatory regime in India on CLS and submarine cables is not open access in nature. There is need of proactive steps to encourage new cables from landing in carrier-neutral CLS's with open meet-me rooms which can land multiple cables and provide an open cables environment where multiple carriers can have free and fair access to the cables coming in. Presently, Consortiums have to rely on one of the ILD license holders in India to own the cable assets in Indian Territorial Waters and act as the consortium's landing party. Open Access CLS facilities will attract more participation by private players and foreign investments. The respective players should also be able to own fibre pairs of submarine cables in Indian territorial waters, own and operate the equipment to light up the fibre pairs. One of stakeholders has suggested to start providing up to $5 million for each cable that lands in a carrier-neutral CLS with complete open meet-me room to all carriers. This could encourage some of the legacy carriers from landing their cables with carrier-neutral entities as opposed to doing it themselves in a closed environment.

2.14 Few Stakeholders have stated that existing regulatory framework does not separate a CLS owner from an ILDO owner (end to end ownership is expected) and suggested that: -

(i) Separation between CLS owner (system level, passive infrastructure) and fibre pair owners (active SLTE infrastructure) in terms of responsibility.

(ii) Allow access to the CLS both at a capacity level (all types of customers) or fibre pair level (for ILDO's only) with a change

in RIO (Reference Interconnect Offer)/AFC (Access Facilitation Charges) regime – Open access Policy.

2.15 One of stakeholders have stated for forming a category-based licensing and regulatory framework for laying submarine cables and setting up of CLSs in India. The proposed framework can have two broad categories of suppliers to build and operate submarine cable systems and Cable landing stations: -

(i) One Category will include (a) The providers, who generally build networks from Data Centre to data Centre to manage the data transfer communications. (b) The suppliers in this category will use such cable systems to build connectivity from Data Centre to Data Centre and should not be allowed to sell capacity in the market to enterprises and Wholesale carriers.

(ii) Other category will include all the licensed parties, who wish to sell capacity in the market to enterprise and wholesale carrier verticals, for example Telcos.

2.16 One of stakeholder also advocated for promoting multiple cable landing zones and making it simpler to set up CLS, fronthaul and backhaul connectivity. It has also been suggested to establish multiple cable protection zones and corridors in Indian waters. To ensure provision of sufficient spatial separation from other submarine cables for unambiguous identification, cable laying, and maintenance.

2.17 Few stakeholders have stated that flexibility should be provided for other ILDO's wanting to access dark fibre pair(s) in such approved submarine cable system. The eligible ILDO or ISP extending the passive international fibre pair on the existing submarine cable system with or without PFE, from the CLS to its POP should not be required to take all the approvals.

2.18 Few stakeholders have stated that the enabling provisions should be made in the existing ILD license to permit transit of international traffic from one CLS to another CLS through terrestrial cable. NLD licenses be amended with enabling provisions for in-land cable landing stations along the coastline for the backhaul of domestic traffic through submarine cables.

Views of stakeholders on SMC ownership aspect

2.19 In response to question 2 above, regarding conditions be made applicable on the ILD licensee for applying permission /security clearance for laying and maintaining the submarine cable and setting up CLS in India, divergent views have been received from the stakeholders.

2.20 Few stakeholders have stated that ILDOs should have 10/ 25 % or greater interest in the submarine cable system for laying cable in the Indian territorial waters, terminating the international cable and should also own or control the Cable Landing Station in India. In support, stakeholders have given following justifications: -

(i) Need to ensure investments by financially strong operators for the long-term sustenance of the asset and criticality of the asset in terms of the digital infrastructure of the country.

(ii) The ownership of Indian ILDO in all such submarine cable will have leverages and better control on operations, bandwidth/ capacity pricing.

(iii) Strategic location as it connects Southeast Asia with Europe / USA.

2.21 Few of stakeholders have stated that to protect national interests and to ensure that our booming digital economy is not impacted by unwanted and unsavory elements, the Government may include a minimum net worth and/ or experience requirements in addition to the existing regulatory requirements if they want to set up CLS and terminate any cable in India over its CLS.

2.22 One of stakeholders has stated that owning the assets in territorial waters does not make any difference since the submarine cable system is a continuous piece of hardware. However, from any security related concern that may arise, the system installed in the CLS and the CLS itself must be under the control of the ILDO.

2.23 Many stakeholders have opined that Para 2.10 (i) & (ii) to be made applicable without mandate for minimum investment percentage. There should not be a requirement that submarine cable in Indian Territorial waters should necessarily be owned by ILD Licensee. An ILD licensee who owns CLS should be responsible for making all arrangements which inter-alia include necessary permission/approval for establishment and maintenance of various submarine cable systems through commercial arrangement between Cable Landing Station owners and cable owner / consortia.

2.24 Some stakeholders have opined that imposing only condition (i) would mean that: -

(i) Only few ILDOs who have deep-pockets and have invested in laying of submarine cables would be able to lay submarine cables in Indian territorial waters and also put up a cable landing station.

(ii) It would put onerous condition for the investors of submarine cable system as well as discourage and restrict use of existing and future cables being built to India.

(iii) Prescribing any percentage of ownership would create entry barrier for ILDOs who want to act as landing station party for any of the consortium/ private submarine cable systems as it may not make any business case. It shall hamper growth of global connectivity with India, would be counter-productive for the growth of nation. Hence this will be a setback to India's digital economy.

(iv) Due to the multiple technical and commercial issues owning some interest in entire cable length of the cable system may not be feasible.

(v) It is also not financially viable for ILD license holders to invest in too many submarine cables, so this becomes an artificial restraint on how many submarine cables can land in India if an ILD License holder must always be an investor in the consortium.

(vi) Acquiring stake in submarine cable system and owning network assets is a financial burden for smaller ILDO as they cannot afford to contribute the initial capital investment for laying the cable nor they are willing to pay the O&M charges. Therefore, such conditions will be burden to smaller ILDO's and discourage them from setting CLS, it thereby affects the growth of subsea cable segment.

2.25 Many stakeholders have opined that to provide flexibility and encourage use of global infrastructure, all the eligibility conditions especially (i) and (ii) as stated in Para 2.10 be made applicable. This means that the ILD licensee fulfilling either of the said conditions, be allowed to seek permission/security clearance for laying and maintaining the submarine cable and setting up CLS in India.

2.26 Many stakeholders have opined that Para 2.10 (iii) be avoided due to issue pertaining to non-compliance of Indian regulations. The ownership of the submarine cable in Indian territory (wet and dry segment) should reside with ILDO under whose license the cable is being landed.

2.27 One of stakeholders has stated that a submarine system has many international termination points along the way. Consortium members take significant financial risk related to a) Geopolitical issues b) Tax and financial risks across many countries and jurisdictions c) Regulatory challenges within each country. Fibre pair termination should be done by licensed operators (ILDO) to take

care of national security and regulatory requirements for landing capacity in India. Non-terminating fibre pairs that are getting landed only for the reamplification and are passing through should be kept away from any such requirement.

2.28 One of stakeholders has stated that para 2.10(i), Defining % ownership in consortium would not be viable option in new consortium models due to several reasons including: -

i. Size of the submarine project (Route Kms). For long transcontinental cable systems, the % ownership of individual consortium member would be small; while on the other hand, in relatively shorter cable systems like those from India to Singapore, the % ownership is likely to be higher, for the same size of investment.

ii. In new Submarine cable systems being built or planned, investments are being made on the basis of full or fractional fibre pair (FP) ownership. Investment opportunities are available in consortium in terms of MIU (minimum investment unit). The MIU could be full fibre pair, fractional fibre pair or certain capacity holding. Individual consortium members would invest in one or more MIU based on their business plans. In fact, it could also include the branch from the trunk for landing in a certain country.

iii. Participation interest by ILDO which is dependent on CLS ownership, IPLC or IP traffic and business forecast.

iv. Segment-wise investment options available in new consortium investment models. New submarine cable systems in making or those being planned allow consortium members to selectively invest in the cable span of their interest.

2.29 One of the stakeholders has opined to follow condition no. (iii) only. Both condition no. (i) and condition no. (ii) will unduly restrict the method and manner in which entities offering digital services and

content in India enter and structure their arrangements with domestic ILD license holders. The US Government requires entities which own a 5% or more interest in the concerned cable system to be a party to the license application, it does not require that the entity that lands the system must exercise ownership or control over the system or consortium. Thus, the U.S. regulatory framework enables an entity that has no interest in the cable system and its consortium to land cables in the country. It also does not require the landing party to own and / or operate all the equipment and assets making up the concerned submarine cable system in U.S. territory. The stakeholder has also stated that non-transmitting equipment or passive equipment such as cable sheaths, power feeding equipment, etc. should also be permitted to be owned, operated, and maintained by non-ILD license holders in Indian territorial waters, its Exclusive Economic Zone and up to the concerned CLS, as such equipment does not pose any security risks for India or result in toll bypass concerns and it would enable faster deployment of capital-intensive critical infrastructure.

2.30 One of stakeholders has stated that it is preferred not to make any of the conditions of para 2.10 as part of ILD License. With respect to security and other regulatory aspects, ILDO or ISP (with international gateway permission) will be responsible. Further, while applying for the permits, ILDO should specify its relationship with submarine cable operator and a written certification or letter of undertaking (LOU) shall be submitted by international cable operator to substantiate the ILDO's position.

2.31 One of the stakeholders has stated that rather than taking a protectionist approach that focuses on India ownership, India should ensure that cable owners, operators, and maintenance service providers may expeditiously deploy and maintain their infrastructure, leveraging existing, time-tested zone arrangements with highly experienced, specialized crews. The stakeholder has

opined to remove all restrictions that force the CLS owners to own the Indian portion of the submarine cable. Encourage all future cables to land in third-party carrier-neutral CLS's with open meet-me rooms by giving up to $5 million per cable landing. There should be no license required to build a new cable nor should there be a Landing Party. A cable owner should need an ILDO license only if they want to sell capacity on that cable inside the country. A private party will need an ILDO operator to terminate its traffic and such a partner can be changed at will.

Analysis of the issues and views of the Authority

2.32 Most of the submissions related to question 1 are related to easing permits/ clearances, approvals, and critical nature of CLS operations. Many stakeholders have submitted similar comments against question 9 also. Such issues have been dealt along with Question 9.

CHANGES REQUIRED IN LICENSING/REGULATORY REGIME IN VIEW OF NEW GENERATION SMC SYSTEM

2.33 Presently SMC landing in India generally have very limited fibre pairs. Mostly all the fibre pairs get terminated at single CLS location owned by an ILDO/ISP who is either owner of SMC or member in the consortium that owns the SMC. So, currently PFE, SLTE and LIM equipment are installed at the same place i.e. at CLS. But in new generation submarine cables having multiple fibre pairs up to 24 pairs, CLS can be of distributed nature as some fibre pair will get extended from the main CLS to other point of presence (POP) location(s) such as CLS PoP(s) (hereinafter referred as CLS-PoPs) by other ILDO(s). Authority agrees with the submissions that new generation submarine cable system with multiple fibre pair can have more than one ILDO[11] as an owner/ member, each having its

[11] A reference to ILDO in these recommendations in respect of SMC and CLS also includes those ISPs who are eligible for establishing CLS as per current licensing regime

own/leased fibre pair(s)terminating at its CLS PoP. It is technically feasible to have either both PFE and SLTE or only SLTE at these CLS PoPs for various fibre pair(s). In such systems, one ILDO can lead the engagement to land the SMC at its CLS. Such ILDO/OCLS main should have prime responsibility of taking all clearances /permissions for terminating the cable on land. However, other ILDOs or OCLS PoPs, who are only extending fibre pairs from the main CLS may only ensure fulfillment of security conditions and need not separately apply for CLS clearance/permissions.

2.34 However, to cater to the needs of technically advanced submarine cables, the current licensing/regulatory regime will require amendments to separately define responsibilities of owners of main CLS and CLS-PoPs respectively. Responsibility of OLCS and fibre pair owners needs to be distinctly stipulated in license as the license / regulatory provision is currently silent on the different scenarios of fibre pair ownership and fibre terminating at different location.

2.35 In view **of the above, the Authority recommends that: -**

(i) ILD / ISP Category 'A' authorization (with International Internet Gateway) license should be amended to include two categories of Cable Landing Station (CLS) locations – (a) Main CLS and (b) CLS Point of Presence (CLS-PoPs). The Owner of the Main CLS would be required to seek all the permissions/clearances related to the SMC landing in their CLS in India. They will also be required to inform Licensor/TRAI about all CLS-PoP locations and their owners.

(ii) The ILD / ISP Category 'A' (with International Internet Gateway) licensees will be allowed to get access and extend their owned or leased dark fibre pair(s) in the submarine cable from the main CLS to their respective CLS-PoP location. Submarine Line Terminal Equipment (SLTE) for the extended dark fibre pairs with or without PFE (Power Feeding

Equipment) should be permitted at these CLS-PoP locations. The owners of CLS-PoPs will not be required to seek CLS establishment permissions/clearances that the owners of main CLS will seek. However, owners of CLS-PoPs will be required to fulfil all other security and regulatory/ license obligation including reporting requirements and establishment of LIM facility.

(iii) The revised detailed guidelines and applications for setting up main CLS and CLS-PoPs respectively, for submarine cables landing in India under respective ILD and ISP License /authorization inter-alia, incorporating provisions as per these recommendations, be issued and made available on DoT website.

OWNERSHIP OF SUBMARINE CABLE LAYING IN ITW

2.36 Presently Cable Landing Station in India are generally owned by entities that are either owner of SMC that land on that CLS or are consortium members in that SMC system. Such entities also hold an ILD or ISP License. As has been previously discussed, in the existing licensing and regulatory framework, requirement of ownership/ stake holding of an ILDO in the submarine cables is not specifically defined for setting up CLS by ILDO/ ISP in India. Also, the scope of work for UL-ILD license does not specifically define the activity of submarine cable laying. However, there is provision under the clause 2.4 of Chapter -1 applicable to all the licensees under UL which states that licensees are required to make their own arrangements for all infrastructure involved in providing the service and shall be solely responsible for the installation, networking, operation and commissioning of necessary infrastructure, equipment, and system, etc.

2.37 The Authority noted the views of stakeholder that CLS and submarine cables being critical strategic asset for digital infrastructure of the country, ownership/ stake in the submarine cable system would ensure the participation of financially strong licensees for long term sustenance of the asset. Also, with stake in the cables, ILDOs will have leverages and better control on operations and bandwidth/ capacity pricing. Further, this condition shall urge the international players to look for Indian partners and will eventually result in Indian licensees having more control on the submarine cables network worldwide which is considered as one of most critical and important digital infrastructure for any country. The Authority also notes the counter view presented by many stakeholders that the condition of mandatory ownership in submarine cables would become an entry barrier for ILDOs / ISPs to act as a landing party. Also, it is not financially viable for even stronger ILDOs to invest in a number of submarine cables. This will restrict the number of future cables coming to India and would put the country in a disadvantageous position. India is already lagging in number of submarine cables as compared to other leading countries in spite of being at strategic location connecting the Southeast Asia to Europe/US. Some stakeholders have suggested separation between the CLS owner's passive infrastructure and fibre pair owners.

2.38 The issue of ownership of SMC and CLS primarily needs to be examined from the perspective of provisions of Indian Telegraph Act and the security requirements. The Authority studied the practices adopted by some countries (such as USA, Singapore, Australia UAE, and Canada) and noted that installation permit/ license is required in these countries for building or operating or landing the international submarine cables. The chapter 4 details the submarine cable licensing framework of USA, Singapore, Australia, UAE, and Canada.

2.39 The Authority in its recommendations dated 16.12.2005 on "Measures To Promote Competition In International Private Leased Circuits (IPLC) In India" has already noted that as per Section 4 (1) of the Indian Telegraph Act, 1885 (ITA, 1885), The Central Government may grant a license, on such conditions and in consideration of such payments as it thinks fit, to any person to establish, maintain or work a "telegraph" within any part of India. As per Section 3 (1) of above Act, "telegraph" means any appliance, instrument, material or apparatus used or capable of use for transmission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, visual or other electro-magnetic emissions, Radio waves or Hertzian waves, galvanic, electric or magnetic means. As the international cable system comprises of wires and appliances and is capable of use for transmission of signal, it is covered as a telegraph system within the meaning of Section 3 (1). Therefore, a license under the ITA, 1885 would be required to bring an international cable through the territorial waters and to land on the shore of our country.

2.40 The Authority notes that the timeline from planning to RFS for any submarine cable is approximately 5-7 years. Hence on the later stage, consortium looks for landing party in the country depending upon the demand and investment by ILDOs. In new generation multiple fibre submarine cables, the investment is being done on full or fractional fibre pair ownership or certain capacity holding. The ILDO may choose not to join the consortium, but it may execute a landing party agreement with the consortium to provide managed landing services to individual FP owners of the cable system. The main concern would be the security and fulfillment of the requirements of Law Enforcement Agencies (LEAs). The Unified License condition 10.5 given in Part-I of the license agreement mentions that "*The Licensor reserves the right to take over the services, equipment and networks of the Licensee in the interest of*

national security or in the event of national emergency/war or low intensity conflict or similar type of situations in full or in part in the Service area." ILDO or ISP (with international gateway) acting as landing party will be responsible for security and other regulatory aspects. For fulfilling the license conditions, the CLS and the access to the system installed in the CLS must be under the complete control of the ILDO. Control over the submarine cable assets in wet i.e. Indian Territorial Waters (ITW) & dry segments will ensure that CLS owner will be able to perform all the obligations and fulfill local and regulatory compliances required under ILD license requirements. The Authority is of the opinion that these requirements need to be primarily fulfilled and for the same it is essential that the SMC assets in the ITW and the CLS are either owned by Indian Licensee who establishes main CLS or at least they sign an agreement with SMC owner/consortium of ownership of submarine cable in Indian waters and submit undertaking that they are owning the asset in Indian territorial waters and at CLS.

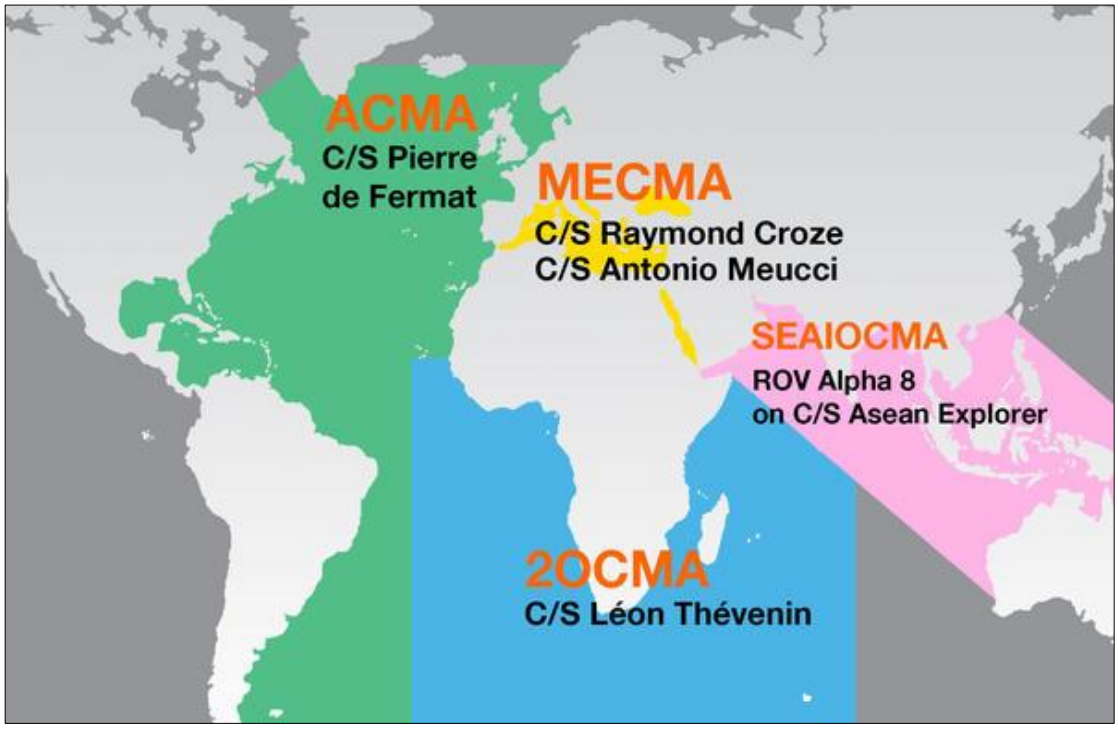
2.41 **The Authority therefore recommends that any ILD or ISP Category 'A' authorization (with International Internet Gateway) Licensee who applies for seeking permissions for establishing main Cable Landing Stations (CLS) should submit an undertaking that they own and control the asset in Indian Territorial Waters (ITW) and at CLS. Such undertaking should be backed by either proof of ownership of the submarine cable (SMC) assets as well as the assets at CLS <u>OR</u> by a signed agreement with SMC owner/consortium to this effect.**

E- Indian Flagged Vessel for submarine cable operation and maintenance

2.42 Submarine Cable installation, operation and repair is an expensive and complex marine operation requiring specially designed ships

carrying highly trained crews and skilled engineers. This highly skilled work is in the hands of the few suppliers such as, Alcatel Submarine Networks and Nexans (France), Prysmian Group (Italy), NKT A/S (Denmark), SubCom (United States), NEC (Japan), and Huawei Marine Networks (China). For SMC repairs, limited number of cable ships are stationed around the world in strategic locations at ports and maintain a high state of readiness. For efficiency and economy, cable repairs are being carried out under contracts through pooled agreements among cable owners, who charter one or more ships dedicated to the repair of cable systems in a particular region. There exist "zone" agreements, as shown in figure 2.1 below, for different zones across the globe between consortiums of cable owners and cable repair-ship owners. Also, the "private" agreements are between individual cable owners and ship owners.

Figure 2.1: - Submarine Cable Maintenance Zone



2.43 India is in a strategically and geographically significant position, where most cable system that connects Europe and Southeast Asia transit. As of now, 17 submarine cables are active and a number of

new cables are under planning/ construction that will soon make a landfall at different coastal cities. India has a 7,516.6-kilometer-long coastline and India's Exclusive Economic Zone (EEZ) covers roughly 2.01 million square kilometers. This long coastline with Exclusive Economic Zone and islands at both ends makes for a unique and strategic position on the world map.

2.44 Presently there are only two main service providers who support all the SMC maintenance activities in and around Indian waters. These marine service providers are mainly based out of Singapore and Dubai. There is high dependency on these service providers for the cable repair along the Indian coast lines. It also involves high mobilization time for the repair vessel to be mobilized from Dubai or Singapore. Presently, no Indian service provider is available. Repair vessels have to come all the way from their base depots to India which requires 10-12 additional days (both way) transit time thereby increasing cost of operations. Further, the foreign crew members need to apply for MOHA on an annual basis which is again a time-consuming process.

2.45 To strengthen the position of India in world submarine cable network map, one possible forward step can be to have a provision of Indian submarine cable repair vessel to improve the current situation of cable repairs in or around Indian territorial waters. However, the viability of owning an undersea cable repairing vessel is complex, CAPEX intensive and challenging to achieve.

2.46 In view of the above, the stakeholders were requested to offer their comments on the following issues with justification:

Q.3 Would an undersea cable repair vessel owned by an Indian entity help overcome the issues related to delays in undersea cable maintenance? Please provide justification for your answer.

Q.4 If the answer to the above question is yes, then please suggest possible mechanisms along with detailed justification and financial viability analysis for implementing this proposal.

2.47 In response to the above questions, divergent views have been received from the stockholders.

2.48 Many stakeholders have agreed that a specialized repair vessel owned by an Indian entity will significantly help overcome the issues related to delays in undersea cable maintenance and dependency on foreign vessels. Stakeholders have stated that Indian flagged vessels could address the following: -

- Long mobilization time
- Exorbitant Cost- Foreign exchange spent by the country.
- Delay in the process of port and permit formalities of Indian ports
- Inefficient cable infrastructure
- Significant cost saving in long run, reduced turnaround time (TAT) and EoDB.
- Help build skillsets/ technical capabilities as opposed to depending on overseas skillsets.
- Provide a new opportunity to Indian Industry under the 'Make in India' programme.
- Another area of opportunity would be to build different category of Indian Flagged ships, bigger in size with specialized equipment for new submarine cable laying.
- One on either coast (east & west), which could extend their cover to international waters, or neighbouring countries too.

2.49 Some stakeholders have stated that a repair vessel owned by an Indian entity may partially address some issues related to delays in undersea cable maintenance and dependency on the foreign vessel providers for repairing the submarine cable system. However, the

repair vessel is just a part of the overall requirement and the other essential elements like trained resources, availability of necessary equipment for repair, provision for a depot for storage of spare cable and cable components like repeaters, UJ kits etc. are also important. Besides setting up an Indian flag vessel, there is need to address current challenges faced for timely cable repair from foreign ships. Unless this entire ecosystem is established within the country, availability of only a repair vessel owned by an Indian entity will not be sufficient and will not make any difference. The stakeholders have also stated the following: -

- The Import and Export clearance procedures are now taking between 30 and 50% of the total mobilization period of the Marine Repair Vessel. This equates to between 30% and 40% of the total cost of the repairs. It should also be noted that 10 to 15 days are required for Import Clearance, thus extending the outage time of the cable.
- The imposition of Customs Duty + IGST for the consumables onboard and imposition of GST during the time the marine repair vessel is in Indian EEZ and Territorial Waters has significant impact on the cost of repairs. These costs are not applicable in any other countries.
- To expedite the cable ship approvals, Maritime belt should be brought back to 12 nautical miles and entire approval process should be made through online portal with minimal human interference and zero paperwork.
- Naval and Customs clearance typically takes one-week time. To save on time, ONGC clearance being an operational clearance can also be obtained in parallel.
- All other permits should be made "pre-permits" so that the Telecom Operators can obtain them well in advance for a longer period of not less than one year.

2.50 Few stakeholders have stated that the Indian flagged vessels could be a useful supplement to existing arrangements as an option, but it should not be mandatory to use ship owned by the Indian entity to do cable repairs in Indian waters.

2.51 Few stakeholders, against the idea of Indian flagged vessel, have stated that India flagged cable ship solution may result in a highly priced and uncompetitive solution in comparison to the global market. It would present challenges not only from a cost competitive perspective but also from an operational perspective in terms of availability of internationally scarce specialist human resources. There are well established cable ship repair service solutions currently available, but the issue is the uncertainty and delay in using these services in India. At present, Owners of submarine cables already have systems and arrangements in place for repairing damaged cables in an efficient and cost-effective manner. Such a system is based on a few ships being responsible for repairing cables across different jurisdictions.

2.52 Few stakeholders have stated an Indian-flagged cable ship would not address any delays in submarine cable maintenance. While having an Indian flagged ship may be preferable from a Make-in-India perspective, it would not result in faster repair times. Streamlining a complex and time-consuming permitting process should be considered as a first step. Stakeholders have suggested not to adopt flag restrictions for cable ships and even if flag restrictions are imposed, they should apply only to the Territorial Water("TW") of India to 12 nautical miles and not to the 200nm Exclusive Economic Zone ("EEZ").

2.53 One of stakeholders has stated that submarine cable owners should be free to choose whom they contract to repair their cables and that the process and regulations that apply to repairs shall be applicable to both Indian and Non-Indian companies equally which will encourage competition. 'Maintenance Agreement' approach led by

interested cable owners has its merits and works well in other areas globally.

Stakeholders' comment on mechanism and justification for Indian flagged vessel

2.54 Few stakeholders have opined that in-order to promote the entry of Indian entities into this recognized business, the Government may consider the following:

- This work should be given the same status as that enjoyed by SEZs and a tax exemption.
- A single window clearance mechanism for permits and approvals.
- Customs duty / GST norms be relaxed in Indian EEZ and Territorial waters.
- Existing / planned routes should be tagged as critical cable corridors and regular patrolling by the coast guard to safeguard cable assets.
- Necessary space should be allocated to Indian operators to set up a 'Cable Depot' (Bonded warehouse) close to the base port of the Cable vessel where customs duty is not applicable, or the depot should be setup in bonded area.
- Provide an incentive, support, and encourage Indian entities and/or Indian ILDOs to form a consortium that owns a cable ship with the Indian Flag stationed at the Indian port within the country.
- The spares and consumables used in the repair activity should be exempted from customs levy / taxes.
- The maritime belt should be brought back to 12 nautical miles for purpose of laying/ownership of cable by ILDO and repair/maintenance operations etc.

- DoT should be nodal agency for issuance of such Certificate in case of Submarine cable systems.

2.55 One of stakeholder has suggested that a Joint Venture (JV) with an existing international operator should ensure the transfer of skills over time, which will enable the ships to be operated by an all-Indian crew in near future. Further, it will not only help to repair the cable in the shortest possible time, but also to lay the cable in the region in the minimum possible time.

2.56 Few stakeholders have stated that the proposed Indian vessel entity can be a government backed and funded consortium (public-private partnership). Indian flag repair vessel can provide services to the existing international operators to manage fault repair incidents in India Waters and around. This will not only bring down the repair time but also lower the cost of repair.

2.57 Few stakeholders have stated that considering the domestic subsea cable CANI (Chennai-Andaman Nicobar) and upcoming Kochi-Lakshadweep (KLI) cable systems, uptimes shall be very crucial in providing uninterrupted services for these islands. Also, with the introduction/build of domestic cable systems connecting various coastal cities in India, this concept of Indian vessel providing repairs & maintenance could be more relevant and economical for all stakeholders. The investment in the Indian flagged vessel to support such repair work can be done from the USO fund. In this regard, an industry-wide committee should be formed comprising government representatives and all major submarine cable operators.

2.58 Few stakeholders have stated that the present model of consortium laid cable repair is based on two types of charges: -

1) Fixed Charges (Storage Charges towards spare of submarine cable and repeaters)

2) Variable Charges (Towards vessel movement and manpower in case of submarine cable cut)

2.59 A stakeholder has provided details on the SMC repair activity for Indian cables and the time taken to repair –

Table 2.2: Details on the SMC repair activity for Indian cables and the time taken to repair

Maintenance	Vessel Base Location	No of Vessels	Vessel Flag	Area of Operation	Average response time in Indian waters
E-marine	Hamirayah (UAE) and Salalah (Oman)	5	Non-Indian	Middle East (Egypt) to Andaman Nicobar Island (India)	3-5 months
SEAIOCMA	Singapore and Indonesia	3	Non-Indian	South-East Asia and Indian Ocean region	4-5 months

2.60 Few stakeholders have stated that as an alternative, existing cable ship operators could be encouraged to relocate and reflag existing vessels, rather than add to existing solutions.

2.61 One of the stakeholders has stated that Joint consortium of ILDO operators or individual ILDO or any private entity can charter a repair Vessel based at an Indian Port.

Analysis of the issues and views of the Authority

2.62 The Authority has noted the submissions made by various stakeholders on reasons for SMC faults. Although damage to submarine cables is infrequent, it is most often caused by human activities such as commercial fishing (in which trawl nets, clam dredges, and other bottom contact gear ensnare cables), vessel anchoring, dredging related to sand and mineral extraction,

petroleum and natural gas extraction, pipeline construction and maintenance, renewable energy construction and maintenance, and other seabed activity. On rare occasions, submarine cables have been subject to malicious attacks. Submarine cables cannot be concealed or hidden, as mariners need to know of their locations in order to avoid damaging them. Submarine cables are also at risk from natural hazards, such as hurricanes, underwater landslides, and seismic events such as earthquakes and tsunamis.

2.63 The installation, maintenance, and repair of the cable network around the Indian subcontinent is crucial for the Indian as well as global economy as submarine cables play a pivotal role in providing access to information and data around the world.

2.64 The Authority agrees with the views of stakeholders that the issue of delay in repairs of SMC cannot be addressed by just having an Indian flagged repair vessel. Having an Indian flagged repair vessel can ease the requirement of some permits and customs duty implications and in process save time and costs for repairs. However, a comprehensive approach to addressing this issue will also require faster clearances, dealing with taxation issues, building capacities, and adequate Cable Depot arrangements to store various spares of the contracted cable systems.

2.65 There are basically three types of cable vessels based on its capability - (a) Survey vessels (b) Layout, Repair and maintenance vessels and (c) Vessels capable of doing both. It is also learnt that the facility already exists in the country to retro-modify a general-purpose vessel/ ship with survey equipment to undertake cable layout corridor survey. The vessels in focus out here are repair vessels capable of carrying out repairs in shallow and deep waters. With 17 submarine cables terminating in India, around 08 new submarine cables under planning and domestic submarine cables

(including CANI and KLI[12]), repair and maintenance of submarine cables around the Indian sub-continent is of critical importance for digital ecosystem. Currently, there is no foreign as well as Indian vessel(s) stationed near ITW. The Authority is of the opinion that Indian Flagged Cable Repair Vessel can help in reducing delay in repair work due to reduced mobilization time, faster clearance/ permit formalities. This can help save costs and help to build required skill sets/ technical capabilities in the long run.

2.66 The depth of water (shallow or deep water) would impact the type of vessels needed for repair. As per ITU definition, the limit of shallow water is of the order of 1000 meters and water depth exceeding the limit of shallow water is called deep water[13]. Deep water repair is done by cable repair vessels through maintenance contract generally while shallow water repair is dependent upon the barge through local contractors. Hence, for cable repair and maintenance work Cable repair Vessels as well as Barges, both would be required to be stationed near the coastline to reduce response time.

2.67 While, having Indian flagged repair vessel has its advantages, financial viability of having such a vessel may be an issue. Repair and maintenance of submarine cable has generally two components (i) Fixed Charges for storage of cable, repeater, and necessary equipment (ii) Variable Charges, applicable for each submarine cable cut. There would be cost benefit in fixed charges for Indian Flagged Vessel stationed at Indian Port as compared to foreign vessel and also for variable charges as Vessel would be required to travel short. However, there would be huge investments required to deploy an Indian Flagged Vessel and also in its running costs.

[12] Chennai-Andaman Nicobar Island (CANI) and Kochi-Lakshadweep Island (KLI)

[13] https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiQ_pD4gdv-AhVgpVYBHXNxBUwQFnoECBMQAQ&url=https%3A%2F%2Fwww.itu.int%2Frec%2Fdologin_pub.asp%3Flang%3Df%26id%3DT-REC-G.972-201109-S!!PDF-E%26type%3Ditems&usg=AOvVaw3sHiXBccai1xlzATInIRry

2.68 The Authority has noted the submissions of one of the stakeholders where it has been mentioned that currently for Chennai to Andaman & Nicobar Islands (CANI) project funded by USOF, Rs. 7 crore per year are being paid for fixed maintenance cost and Rs.14 crore for every cable cut. The same is expected to be replicated in Kochi to Lakshadweep and Alternate Submarine OFC connectivity for CANI project, once these projects become operational. Thus, huge recurring investment has already been done by government through USOF towards submarine cable maintenance. The Authority feels that over a long period of time, the government through USOF would be shelling out large sum of money towards SMC repair and maintenance activity and therefore it makes sense for Government to take lead in finding out possible ways to reducing these costs and building local capacities in line with theme of 'Atmanirbhar Bharat'.

2.69 In view of above, as India has no experience in cable repair vessels the Authority is of view that a committee should be formed comprising government representatives (from DoT, DG Shipping, Shipyard Kochi/Visakhapatnam/ Mumbai, MHA, Department of Revenue) and major ILDOs having stake in SMC to study and recommend the different financial viability models for **Indian Flagged repair Vessels**. The Authority is also of view that considering the submarine cable as critical digital infrastructure and only few leading countries (US, France, Italy, China, Denmark& Japan) have expertise in this field, government should play key role in incentivizing such an effort to the extent possible. The Indian flagged SMC repair vessels would also target cables beyond the Indian EEZ to become financially viable. These Vessels can also be used for other areas such as to explore the natural resources, laying / repairing of future power (DC) submarine cable between countries as well as different cities.

2.70 The idea of Indian Flagged Repair Vessel would take some time to materialize. In the meantime, it is required that some immediate

steps are taken to address current challenges for cable repair. In this regard, establishment of cable depot for storage of spare cable, repair equipment and cable components would be boon for submarine cables. The Authority is of view that custom free zones should be identified in both west and east coast zone respectively to set up a 'Cable Depot' which should provide a strategic base for future Cable laying/repair Vessels. The depot should be situated at a location to facilitate rapid response times for vessel mobilization within short time of call, with spares and essential repair kit to complete cable repairs. The Authority is of view that these 'Cable Depots' should be given the same status as that enjoyed by SEZs, and the repair material stored in these depots should be exempted from provisions of GST/custom**.** The Government should collaborate with coastal states intending to promote vessels/ cable depot and submarine cable system and consider providing incentives in form of Land bank for 'Cable Depot'.

2.71 The Authority has noted the submissions of one of the stakeholders that had based their cable ship in Kochi from 2004 to 2012. They had even launched a study to initiate setting up depot in Kochi, but the plan for the Indian depot did not materialize as it was not supported by the then environment. The Authority feels that as a stop gap arrangement, Cable repair vessels active in Indian Sub continental region may also be approached by this Committee to persuade them to locate its vessels at Indian port.

2.72 The Authority also agreed that apart from the repair vessel there are other essential issues related to clearances/ permits. Some of these issues related to delay in permit/clearance for repair work of submarine cables in ITW / EEZ, have been addressed by the Authority in its Recommendations on EoDB in telecom and Broadcasting services (released on 02 May 2023). Further in this direction, the Authority is of view that crew members in the Vessel for submarine laying and repair work having valid work permit of

India may be exempted from obtaining clearance repeatedly. Also, in case there is no change in the data provided for submarine cable related work, auto renewal option may be made for the clearance from different government agencies and only the changes be considered for taking clearances**.**

2.73 The Authority is of also of the view that the Indian Flagged Repair Vessel should supplement to existing arrangement as an option and would offer its service to the owners of the cables / existing players involved in repair work. There should not be any flag restrictions for repair work in ITW/ EEZ in India. The existing mechanism followed by owners of submarine cables should continue to lay, maintain, and repair submarine cable.

2.74 The Authority is of the opinion that the possibility of establishing 'Cable Depots' in existing ports and shipyards needs to be explored as these locations have an inherent advantage of strategic location and connecting infrastructure. The

2.75 In view of the above, **the Authority recommends that: -**

(i) DoT should constitute a committee comprising government representatives (from DoT, Ministry of Shipping, Shipyards at Kochi/Visakhapatnam/Mumbai, MHA, Department of Revenue (MoF), and major ILDOs having stake in SMC to study and recommend the different financial viability models for Indian Flagged Repair Vessels including possible incentives from Government.

(ii) As a stop gap arrangement, SMC ship repair operators active in Indian Sub continental region may also be approached by this Committee to persuade them to relocate and reflag their repair vessels at suitable Indian ports as per requirement.

(iii) Cable Depot should be identified in both west and east coastline for storing submarine cable and the necessary equipment/ kit for carrying out cable repairs. The depot

should be situated at a location near to existing or upcoming CLS to facilitate rapid response times to complete cable repairs. Also, these Cable Depots should provide a strategic base for Indian Flagged Vessels in future.

(iv) The committee proposed at para (i) above, should also be entrusted with the task of suggesting ways and means to facilitate and incentivize setting up of these 'Cable Depots', inter-alia, considering the following:

- **a. Giving same status to 'Cable Depots' as that enjoyed by SEZs and exempting the repair material stored in these depots from provisions of GST/custom.**
- **b. Possibility of collaboration with coastal states who intend to promote vessels/ cable depot and SMC system and consider providing incentives in form of Land bank for 'Cable Depot'.**
- **c. Possibility of collaboration with Central and State Port Authorities and Shipyards for allocation of land and other facilitations for 'Cable Depot'.**

(v) The crew members in the survey/ repair vessel for submarine laying and repair work having valid work permit of India may be exempted from obtaining clearances repeatedly during permit period.

(vi) DoT with other agencies that are involved in giving various permissions for SMC installation and repair activities may examine the possibility of auto renewal option in cases where there is no change in the data provided for getting permissions for SMC related activity. The option of taking only such data that has changed since grant of last permission may also be examined.

CHAPTER 3

DOMESTIC SUBMARINE CABLE, STUB-CABLE, AND TERRESTRIAL LINK

A- Domestic Submarine Cables

3.1 Submarine cable systems are widely deployed in many countries (USA, Europe, and Australia) for domestic connectivity purpose. In India, Chennai-Andaman, and Nicobar Island (CANI) submarine Cable was commissioned recently in August 2010 that connects Port Blair along with seven other Islands of Andaman & Nicobar to improve telecommunication facility in the Islands by providing large bandwidth. Also, KLI (Kochi-Lakshadweep Island) Submarine Cable Project is under implementation. On similar line, Submarine cables can also be envisaged to connect major/ important coastal cities of India for high-speed reliable data connectivity. It can connect all major cities and Data Center hubs along the western and eastern coastal line that will provide robust network for Indian domestic traffic as well as the Data Center centric traffic. The reliability and stability of submarine cable networks is very high as compared to the terrestrial optical fibre cable network. It may also be cost effective, as it will require relatively lesser encumbrances to roll out this network and lower OPEX to maintain connectivity between cities using this proposed network.

3.2 Presently in India, under existing licensing/ regulatory framework, there is no specific and clear provision to connect two or more cities on the coastal line through domestic submarine cable. Also, the current framework does not have provisions for setting up of cable landing station for handling purely national/ domestic traffic or both national and international traffic.

3.3 In this regard, stakeholders were requested to give their comments on the following issues with justification: -

Q.5 What measures should be undertaken for promoting Domestic submarine cables for connecting coastal cities in India? What limitations are being posed by existing licensing and regulatory provisions for laying domestic submarine cables in India? What are the changes required in the existing licensing and regulatory framework? Please answer in detail with the supporting document, if any.

Q.6 Are any limitations being envisaged in respect of getting permissions and/or associated charges/ fee for laying domestic submarine cable and its Cable Landing Station? What are the suggested measures to overcome limitations, if any?

3.4 In response to the above questions, most of stakeholders have stated that currently there is no distinct regulatory provision for domestic submarine cable networks and have suggested for establishing clear, stable, and transparent licensing/regulatory regimes to promote domestic cables in the country. Few stakeholders have stated that clarity needs to be brought on how traffic flowing through such SMC will be treated - as international or National traffic. They have also suggested bringing clarity on LIM (Lawful interception Monitoring) requirements.

3.5 A few stakeholders have raised concerns on viability of domestic SMCs and stated that the initial costs of constructing and maintaining a domestic SMC network are higher than those for terrestrial networks, which could make it difficult to recover the costs. Additionally, due to the need for international vessels, expertise in laying, repairing, and maintaining domestic submarine cables, it may be challenging to establish a purely domestic submarine cable network.

3.6 Few Stakeholders have submitted that the domestic cables may be used for carrying.

a) Domestic traffic i.e., backhaul of domestic traffic.

b) International traffic to provide diversity and redundancy.

c) International transit traffic from one CLS to another CLS

3.7 Many stakeholders have suggested that Domestic submarine cable should be laid under NLD License. Both terrestrial and undersea domestic networks should be permitted to connect with each other without the requirement of lawful interception. A few stakeholders stated that each coastal state should identify a submarine cable laying corridor with pre-defined maritime approvals to streamline the permitting process. This would provide clarity and reduce the time and cost required for obtaining maritime approvals.

3.8 Few stakeholders have submitted that LIM (Lawful Interception Monitoring) requirements need to be ensured. Some stakeholders are of the view that since domestic SMC network will be created within Indian territory/territorial waters, there should be no requirement of lawful interception for domestic traffic.

3.9 Few stakeholders have opined that Domestic submarine cable should be laid under ILD and NLD License and stated that a submarine cable meant only for NLD/Domestic traffic may not achieve the desired economies of scale considering the huge investments required for creating such an infrastructure. International cables, either currently deployed or upcoming can easily be used for the purpose by extending them to other Indian coastal towns with an incremental investment. Domestic traffic may be allowed on cables, which are part of or merge with an international cable. Wavelength level splitting can be done to segregate NLD and ILD traffic and all provisions pertaining to international cables like LIM, etc. which fall under the ambit of the ILD License should be applied for both domestic and international traffic.

3.10 To promote domestic cables in the country, few other stakeholders have suggested that the Existing ILDOs should be allowed to

dedicate a few fibres only for domestic traffic in existing/upcoming new submarine cable systems. A different Domestic CLS should not be mandated, instead a physical/ optical separation of terminating equipment for domestic and international traffic should be maintained. They have also suggested that cconnectivity to international side should be allowed to increase the utilization and viability of these domestic subsea cables. ILDOs/ NLDOs should also be permitted to use the same cable infrastructure for domestic and international connectivity under their respective license agreements. IP-1 provider/NLDO shall be permitted to implement domestic cable connectivity/ provide Domestic subsea dark fibre and sharing of the existing ILD submarine infrastructure.

3.11 Some stakeholders are of the view that instead of categorizing the cable as domestic or international, rules for the cable should be based on traffic flows rather than the physical cable. A few others have suggested bringing clarity on whether domestic SMC can cross ITW/EEZ or not. One of the stakeholders have opined that once a domestic SMC is laid beyond 12 nautical miles from the coast, there will be no control to ensure that there is no handshake with other international cables at high sea and only domestic traffic is carried on the cable. Therefore, the stakeholder is of the view that the domestic SMC should never go beyond Indian territorial water and carry strictly domestic traffic.

Analysis of the issues and views of the Authority

3.12 The challenges and limitations in existing licensing/ regulatory framework for domestic SMC are same as that of international submarine cables. Authority agrees with the views of stakeholders that higher initial costs of constructing and maintaining a domestic submarine cable network and non-availability of Indian vessel and skilled human resources are major challenges in establishing domestic SMC network.

3.13 The Authority also agrees with the view of the stakeholders that distinct and clear licensing provision under ILD as well as NLD license needs to be spelt out for establishing domestic submarine cables between two or more coastal cities.

3.14 As far as issue of bringing clarity on whether domestic SMCs should be confined to ITW is concerned, the Authority is of the view that a precedence in this regard has already been set in case of CANI project where the SMC has been routed through India TW and EEZ and also International Waters. Even in many other domestic SMC systems globally the cables cross into international waters and come back. The route plan of any SMC, generally done by surveyor vessels, is based on considering the marine ecosystem, existing infrastructure layout (telecom, oil & gas, etc.) and restrictions imposed, if any by the state/ country. Hence, the route plan for domestic SMC should be left to industry expertise and be allowed to go beyond ITW /EEZ into international waters for techno-commercial benefits and to improve Mean Time Between Failure (MTBF).

3.15 A submarine cable meant only for NLD/Domestic traffic may not achieve the desired economies of scale considering the huge investments required for creating such an infrastructure. It is technically feasible that the domestic subsea cable would be capable of catering for both NLD/ domestic traffic as well as to transit international traffic through domestic cable. Hence, the domestic submarine cable would supplement both the NLD network as well as international SMC network and there should not be any restriction. The domestic SMC should be allowed to land on the existing CLS with physical separation of terminating equipment for domestic and international traffic. This arrangement for domestic submarine cable will have better economy of scale as well as improve route redundancy, network latency, etc. The Authority is of the view that categorizing the cable as well as CLS as domestic or

international under respective ILD / NLD license should depend on the traffic that is carried through them.

3.16 It is noted that out of 17 submarine cable terminating in India, some of them are getting terminated at two CLS in different cities (generally at Mumbai and Chennai). Also, some of future submarine cable would have two different CLS in India. Hence, the existing or upcoming submarine cable connecting two different coastal cities can also be used for carrying domestic traffic on separate fibre pairs/ wavelength basis.

3.17 The Domestic Submarine cable would bring some of coastal cities (other than Mumbai and Chennai) on world map with direct high speed international data connectivity and would also connect to existing data center hub at Mumbai and Chennai. It will further help in the establishment of numerous businesses requiring robust data connectivity at low latency in the cities on both east and west coastline. This will provide cable diversity and reduce load in Mumbai & Chennai. Hence, there is need that both central and state government promote and facilitate in establishing domestic submarine cable and some financial incentive / tax holiday / subsidized land parcel for CLS.

3.18 As far as requirement of LIM facilities is concerned, the Authority has noted that the security conditions mentioned under NLD authorization merely state that the requisite monitoring facilities shall be provided by the Licensee as per requirement of Licensor. Whereas in ILD authorization very detailed requirements of LIM and Central Monitoring System (CMS) have been mentioned. Thus, for those cables that will handle only domestic traffic and will be terminated in CLS that handle only domestic traffic, the LIM provisions of NLD license should be applicable. In all such CLS where SMC carrying mix traffic (NLD and ILD) lands, in cases where such traffic is carried on separate fibre pair and such pairs are

terminated in physically separate areas in CLS, the LIM facility should be provided as per respective license conditions.

3.19 In view of the above, **the Authority recommends that following provisions may be made under NLD and ILD License/authorization: -**

(i) NLD licensee may be allowed to establish, own, maintain, and operate domestic submarine cables connecting two or more cities on the Indian coastline and to set up CLS for landing of such domestic submarine cables as per following conditions –

a) Domestic traffic through submarine cables will be allowed.

b) Wherever required, the Domestic Submarine cable may be permitted to go beyond ITW or EEZ of India for techno-commercial benefits.

c) Equal access to facilities at the Cable Landing Stations (CLS) including landing facilities for submarine cables of other NLD license operators on the basis of non-discrimination shall be mandatory.

d) Access/ Co-location at the CLS shall be governed by the orders/regulations/directions issued by TRAI from time to time.

(ii) The domestic and international cables can terminate at the same CLS but with each cable having its own separate network element/ equipment (PFE and SLTE). A physical separation of terminating equipment for domestic and international traffic should be maintained.

(iii) Such CLS where both domestic and international cables are terminated, should be owned, and operated by integrated players (having both ILD and NLD license/authorization). The requirement of necessary LIM should be based on the nature of traffic carried, being NLD or ILD and owners of CLS should

maintain physical separation for terminating domestic and international traffic.

(iv) International Submarine Cable should be allowed to carry domestic traffic on dedicated fibre pairs that are provisioned between two Indian cities. Licensee should ensure that such traffic is not transited/ routed through any other country outside India.

B- Terrestrial Link between the CLS

3.20 The international bandwidth/ traffic on submarine cables terminates and connects to the terrestrial network of the country at the landing stations called CLS. The Landing stations tend to be close to the shore. The seeker of international bandwidth wants to have bandwidth on multiple submarine cable systems to have high level of network availability and reliability. Demand for route diversity, redundancy, and more direct control over critical infrastructure is driving the need for more submarine cables. Submarine cables are also required to respond to unexpected spikes in demand, such as carrying traffic that is rerouted from other submarine cables following a cable fault. To meet the above requirement efficiently in minimum time, the connectivity between the CLSs of different submarine cable can be helpful. The direct connectivity between the CLS will provide reliability to international network, improve the network latency, and provide route diversity.

3.21 In view of the above, stakeholders were requested to give their comments on the following issues with justification: -

Q.7 What challenges are being posed by existing telecom licensing and /or any other framework for establishing terrestrial connectivity between different CLSs in India? What are possible solutions to such challenges? Please support your answer with detailed justification.

Comments of the stakeholders

3.22 Majority of the stake holders, associations and individuals opined that under present conditions, no major challenges or regulatory hurdles are envisaged in establishing terrestrial connectivity between different CLSs in India except for the fact that connectivity should be implemented through NLD authorization and that RoW related challenges continue to exist while rolling out terrestrial network.

3.23 However, some stakeholders have submitted that direct connectivity between CLS of two independent owners as a means of providing additional redundancy should be allowed. Current regulation is not clear whether such connectivity is allowed or not. It has been submitted that end users may be allowed inter-CLS connectivity within India from ILDOs/ NLDOs.

3.24 One of the stakeholders stated that non-availability of express utility corridors in India, coupled with intermittent fibre cuts due to developmental activities by various agencies, lack of synergy in coordinating such activities with terrestrial fibre owners pose major challenges for rolling out reliable terrestrial networks to connect CLSs. Another stakeholder stated that certain customers who are seeking India transit only are facing difficulty due to lack of any existing policy that allows for transit of traffic from one CLS to another without the need of any LIM or RIO/ AFC charges. It has been suggested that there should be no requirement of LIM setup for transit traffic (non-India terminating pass through traffic between any two connected submarine cables in same or different cable landing stations). It has also been submitted that no AGR and GST to be imposed for transit traffic which would help Indian ILDO to compete with global pricing. Another stakeholder was of the view that ILD license should be amended to permit transit of

international traffic through land route in case they also hold an NLD license.

3.25 One of the stakeholders also brought out that no policy framework is in place promoting connectivity between multiple CLSs at SLTE level (before capacity landing), which may enable quick restoration options of capacities between cable systems in case of the failures.

Analysis and view of the Authority

3.26 The Authority is of the view that the arrangement for establishing terrestrial connectivity between CLS provides route diversity, low latency for transit international traffic and protection in case of cable fault. The Authority noted that there is no licensing/ regulatory restriction for establishing terrestrial connectivity between CLS in India. Owners of CLS (OCLS) can connect their CLS with other CLS directly through terrestrial links. As the establishment of terrestrial link comes under NLD license, hence OCLS can have arrangement on its own if holding NLD license or through the NLD licensees for such connectivity. However, to ensure that there is no ambiguity, the Authority is of the opinion that ILD and NLD license/authorization should explicitly clarify in technical conditions that such arrangements are allowed.

3.27 The Authority agrees with the views of stakeholder that the transit of international traffic be permitted from one CLS to another CLS through terrestrial cable or submarine cable. The enabling provisions should be made in the existing ILD license to permit transit of international traffic from one CLS to another CLS through terrestrial cable or domestic cable. The ILDO(s) must disclose the routing details of international transit traffic to the TERM Cell/ licensor/ TRAI.

3.28 The Authority is of the view that there is no requirement of mandatory direct terrestrial connectivity between the CLSs as it

should be the decision of the owners of CLS depending upon their requirement and business viability.

3.29 In view of the above**, the Authority recommends that: -**

(i) ILD and NLD licenses should explicitly mention that terrestrial connectivity between different CLSs is permitted.

(ii) ILD license should explicitly clarify that transit international traffic not meant to be terminated in India will be permitted to be transited to other submarine cables through terrestrial as well as submarine cable links.

C- Stub- cables

3.30 Submarine stub cables are pre-laid, open-ended dark fibres that are placed from a cable landing station through a beach manhole into territorial waters, via designated cable corridors. These cables serve as a cost-effective solution for providing spare infrastructure for future submarine projects. Stub cables are laid alongside existing submarine cables or routes, allowing for faster deployment and reduced disruption to the seabed.

3.31 The stub-cable generally will have higher fibre count, so that multiple future projects can make use of this stub-cable. This pre-laid infrastructure will reduce the actual time required for the overall project implementation and will be cost effective for future projects. Being a readymade infrastructure, it will attract cable investments for submarine cable landing, thus the overall submarine cable capacity will increase. The implementation of Stub-cable arrangement will involve distinct activities under two phases. In Phase-1 - Deployment of “Stub-cable” as dark fibre and in Phase-2 – Allocation of Fibre pairs of stub-cable for the new submarine cable system. Both the activities under two phases may require different

necessary permits and clearance from the concerned government bodies.

3.32 Stub-cable installation can ease country's Landing requirements. Few countries insist on the installation of such stub-cable along with any other ongoing project to keep the infra ready for future projects and to limit their approval requirements.

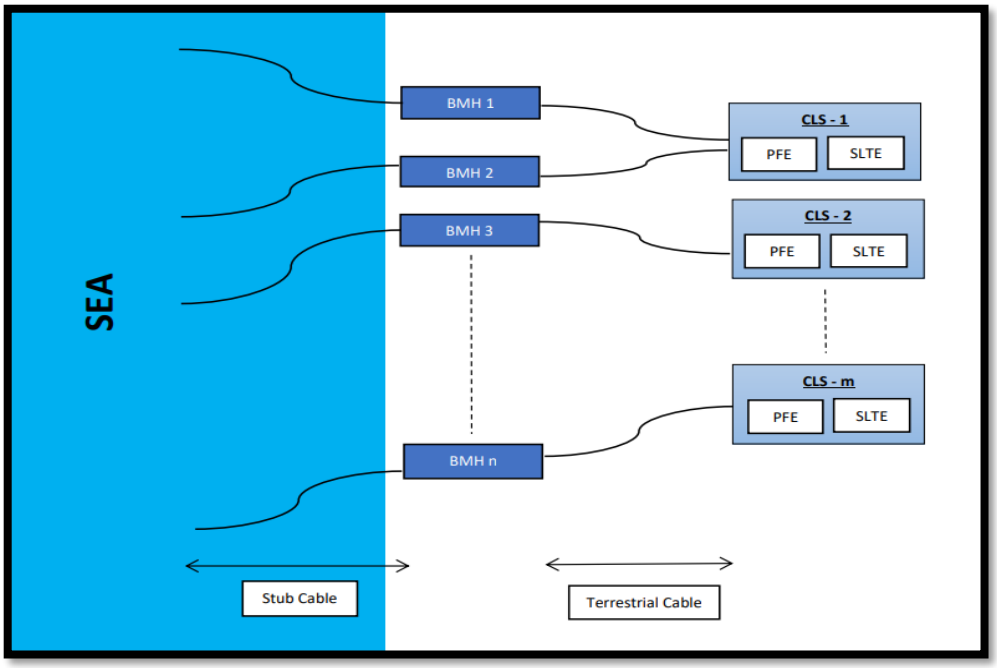


Figure 3.1 – Schematic diagram of Stub-Cable

3.33 In view of the above, stakeholders are requested to give their comments on the following issues with justification: -

Q.8 Will it be beneficial to lay Stub-Cables in India? If yes, what should be the policy, licensing, and regulatory framework for laying, operationalizing, and maintaining the stub cable in India? Please answer in detail with the supporting documents, if any.

Comments of the stakeholders

3.34 The stakeholders, through their comments, have expressed mixed views in response to the above-mentioned question. Few stakeholders are of the opinion that implementation of stub cable concept in the overall setup of SMC in India will not only lead to significant shortening of complex procedural timelines associated with obtaining Customs and Administrative clearances but will also attract new investments while encouraging development of new submarine cable systems, both for domestic and international use. They further opined that implementation of stub cables in India will lead to development of much required skillset/ creation of expertise on laying of submarine cables and in handling of its associated cable layout/ repair equipment in country and will also result in overall reduction in FOREX expenditure.

3.35 Another set of stakeholders are of the opinion that maintenance and repair of stub cable-based submarine cable landings are cost as well as resource intensive with potential risk of single point failure and in order for a stub cable to be advantageous from the RoI perspective, it needs to be laid out beyond the extent of territorial waters for reaping the benefits of bypassing permit obtaining requirements. They further brought out that stub cable approach is more appropriate for countries having limited coastal space and may prove beneficial only for Mumbai and Chennai in Indian context where majority of existing as well as futuristic submarine cables are making a landfall however, it should not be made obligatory upon newly planned cable systems to use these stub- cable systems as this may kill the competition.

3.36 Apart from the above stated comments, the stakeholders who shared their comments opposing the proposed stub cable approach for Indian coastline brought out that the stub cable can promote monopolistic ownership ecosystem for CLS operations in India. They further stated that it will be extremely difficult for ILDOs to identify

beforehand the potential landings and forecast futuristic infrastructure requirements upfront prior to laying a stub cable infrastructure along with a new cable. Moreover, the use of stub cable to land multiple subsea cables into the country via separate approvals will not facilitate the required cable diversity from Beach manhole to the undersea stub location. The stakeholders have also pointed out that prior stub deployment limits owners/ operators from taking advantage of future technological improvements vis-à-vis cables as it commits them to the given (albeit outdated) cable design/ configuration that was chosen at the time of deployment. The operator is not able to monitor the fault in the cable and at the time of actual usage, it may be a challenge to use it.

3.37 Many stakeholders are of view that there should be a policy to allow stub-cables with fibre pairs provisioned at designated locations beyond the territorial water limits so that they can serve as ready infrastructure for future cable or fibre pairs coming into India. Stub-cables should be allowed however it should not be mandatory.

3.38 Some stakeholders have also suggested certain terms of reference for policy and licensing framework with regards to stub cables, which are stated below:

(a) Stub cable should be owned in totality by an Indian ILDO licensee and the permission for its laying out should be governed by ILDO licensing provisions.

(c) Layout of stub cables should be permitted beyond territorial waters with due consideration of all pre-requisite clearances such that any new project requiring such infrastructure need not be separately approved for its layout within Indian territorial waters.

(d) Intimation of stub cable fibres and their usage needs to be communicated to the DoT/ regulator periodically and on every occurrence of its usage.

(e) Prior approval to be obtained from DoT while rolling out a stub cable infrastructure with any new / existing project. Once the stub cable fibres are being allocated for any new cable landing, the new project owner should be responsible for LIM and other applicable regulatory compliances.

Analysis and view of the Authority

3.39 The Authority agrees with the views of the stakeholder that stub-cables can reduce timeline, complex clearances/ permits, and cost for installation of new submarine cable in India. They can serve as ready infrastructure for future SMC coming into India. This pre-laid dark fibre arrangement will encourage new investment & growth of submarine cables in India. However, these stub-cables may remain idle for long time and the connectivity may not be available due to faults at the time of actual usage. Prior stub deployment limits owners/ operators from taking advantage of future technological improvements vis-à-vis cables as it commits them to the given stub cable design/ configuration that was chosen at the time of deployment. There may also be financial viability related concerns for laying stubs as limited for number of submarine cable land in the country. In case same stub route is used for multiple cables, it can become single point of failure.

3.40 The Authority has also noted the submissions of a few stakeholders that concept of stub-cable is more suitable for countries with limited coastline and minimal area available for setting up CLS. India has vast coastline along two arms, transatlantic and transpacific side so there is need for diversity of CLS from the present cluster of submarine cables mainly at Mumbai and Chennai. Also, stub cable wouldn't be necessary for other locations as the number of submarines would always be limited.

3.41 The Authority is of the view that most of submarine cables in India are landing at Mumbai and Chennai only as these locations have high concentration of economic activities and digital ecosystem in place. Hence for these two locations (Mumbai and Chennai), stub-cables may be beneficial as it can minimize disturbance to existing infrastructure, marine ecosystem, and to reduce timeline for bringing submarine cables in India. Therefore, laying Stub-cable along with the new submarine cable particularly for locations in Mumbai, Chennai, and Kochi can have its merits. In addition, these stub-cables may also be used in case of cable fault in the area up to ITW/EEZ to divert cable length from BMH up to ITW/ EEZ of India. The Authority is of the view that pre-laid out stub cable segment into international waters will not only amount to significant shortening of procedural delays associated with any new subsea cable landing on Indian shores but will also give due impetus to development of indigenous skill-sets for layout and repairs of submarine cables in India.

3.42 The Authority agrees with the views of stakeholders that laying of stubs with every SMC project should not be mandated as the quality of stub, number of pairs and location may or may not suit the next SMC project requirements and the whole investment may lie idle till suitable candidate cable is found. The Authority is also in agreement with the stakeholders that there should not be any obligation on planned new cable systems to India to use these stub cables as this could severely limit competition to provide access to submarine cable capability in India.

3.43 Despite the fact that there may be counter arguments on the use or feasibility of Stub cables, the Authority is of the opinion that there is no disadvantage in allowing this concept. Interested parties, if they find merit in laying stubs, can do so if the licensing/regulatory regime is amended to allow them to do so. The Authority is of the view that stub-cable being sensitive asset, only ILD / ISP Category

'A' license/authorization holders be eligible for laying and maintaining these stub-cables. The owner of Stub-cable must disclose the details of used and unused dark fibre pairs to licensor/ TRAI annually and seek prior approval for using/ sharing these dark fibres to other eligible ILDOs/ISPs. Further, the stub cables can be allowed to be laid up to any distance within EEZ. The owner of stub must provide access of stub-fibre pair(s) on fair and non-discriminatory basis. They should be allowed to transfer the ownership of stub, if required, to other eligible seeker ILDOs/ ISPs. Once a stub-cable is allocated for a new project, the new project owner intending to use the stub-cable infrastructure for onward termination of cable into India will be responsible for the LIM and other applicable regulatory compliances post the integration of stub cable fibre pairs for end-to-end cable system and its operations.

3.44 In view of the above**, the Authority recommends that ILD / ISP Category 'A' license/authorization should be amended to allow these licensees to lay stub-cable (pre-laid dark fibre SMC) and either terminate them in their existing CLS or establish new CLS for such stub-cable with prior-permission of licensor. The following terms and conditions will be applicable for stub-cable:**

a) **The stub cables can be laid up to any distance within EEZ.**
b) **The owner of Stub-cable must disclose the details of used and unused dark fibre pairs to licensor/ TRAI annually and seek prior approval from licensor for using/ sharing these dark fibres to other eligible ILDOs/ISPs.**
c) **The owner of stub must provide access of stub-fibre pair(s) on fair and non-discriminatory basis.**
d) **The owner of stub will be allowed to transfer the ownership of stub, if required, to other eligible seeker ILDOs/ ISPs with prior permission from licensor. Once a stub-cable is transferred to the new owner, the new owner intending to use the stub-cable infrastructure for onward termination of**

cable into India will be responsible for the LIM and other applicable regulatory compliances post the integration of stub cable fibre pairs for end-to-end cable system and its operations.

D- Further measures to be undertaken for promoting investment to bring submarine cable in India.

3.45 To understand what further measures can be undertaken for promoting investment to bring submarine cable in India, the stakeholders were asked to comment on the following question -

Q.9 In comparison with other leading countries, what further measures must be undertaken in India for promoting investment to bring submarine cable in India? Please answer in detail with the supporting documents, if any.

Comments of the stakeholders

3.46 Most of stakeholders have shared similar comments with regards question 1 & 9 respectively stating that there are several clearances/ permits required from various authorities such as MOD, MOHA, DG Shipping, Indian Custom and Environmental clearance and Environment Impact Assessment (EIA) approvals and Coastal Regulation Zone (CRZ) clearance from Ministry of Environment, Forests and Climate Change (MoEF&CC) for laying/ repair of submarine cables. No committed TAT (Turn Around Time) exists for all such applications made for various clearances and the delay to get approval results in escalation of cost for laying the cable. Stakeholders have stated that all approvals and permissions pertaining to cable landing stations and repair and maintenance work of cables should be moved to an end-to-end digital paperless process with fixed timelines and online tracking mechanism. This

will bring transparency and consistency to the process. It will lead to better utilization of the Submarine Cable systems, better apportioned costs, higher availability of international bandwidth in the Indian market, more competition leading to better pricing and lowering of apportioned cost of laying and maintaining of these Submarine Cable Systems for the consortium.

3.47 Few stakeholders have opined that Submarine Cable laying & repair services should be accorded the status of 'Critical & Essential Services', akin to accord of 'Essentiality Certificate (EC)' issued in E&P (Exploration and Production) sector by Directorate General of Hydrocarbons (DGH) under Ministry of Petroleum for petroleum exploration related activities. With EC accorded, the goods & services utilized on vessel for undersea exploration and mining of hydrocarbons are exempted from Customs Duty & IGST (on submission of Charter agreement between Vessel Owners & operators). Similar certification/ benefits need to be extended for CLS and submarine cable repair and laying jobs, being 'Critical & essential services'.

Analysis and view of the Authority

3.48 The Authority agrees with the submissions made by some of the stakeholders that setting up a new cable landing station and laying/ repair work of submarine cable is a time consuming and complex process as various clearances/ permits are required from different departments/ agencies. There is no defined TAT for various applications. The Authority also favourably opines that there is a need to establish cable protection zones and corridors in Indian waters as well, in line with other leading countries like Singapore and Australia. The Authority is also aware of the fact that Environmental Impact Assessment (EIA) has now been made mandatory under the Environmental Protection Act, 1986 for 29

categories of developmental activities involving investments of Rs. 50 crores and above and with a view to ensure multi-disciplinary input required for environmental appraisal of development projects. Expert Appraisal Committees have been constituted by the ministry for sectors such as mining, industrial projects, thermal power projects, river valley and hydroelectric projects, infrastructure development and miscellaneous projects etc. It is also noted that Expert Appraisal Committee of MoEF & CC[14] for projects related to Coastal Regulation Zone in its meeting held on 06 July 2022 301st minutes, for item no. 3.2 on CRZ clearance of submarine cable system landing in Chennai, had suggested for the Government to create an appropriate corridor for laying submarine cable systems in the coastal area for better management and to avoid conflict with various stakeholders considering the increasing number of international cable landing on the Chennai coast.[15] Most of the submissions made by stakeholders against question 1 on limitations being posed by existing licensing and regulatory provisions for laying submarine cables and setting up of CLS in India are related to Ease of Doing Business (EoDB). These concerns have already been dealt with by the Authority in its consultation paper on "Ease of Doing Business in Telecom and Broadcasting Sector". The Authority in its Recommendations on EoDB dated 02 May 2023 has recommended the following related to submarine cable laying and repair: -

(i) Submarine cable laying and repair in Indian Territorial Water and Exclusive Economic Zones ('EEZ') of India and Cable Landing Stations in India should be classified as 'Critical and Essential services'. It should be given 'Top Priority' for obtaining necessary permission and security clearances from the ministries/ departments/ agencies involved.

[14] Ministry of Environment, Forest and Climate Change
[15] https://environmentclearance.nic.in/writereaddata/Form-1A/Minutes/1907202286891953Minutes301.pdf

(ii) *Permissions of laying, operations and maintenance of submarine cables network should also be made online as a part of Saral Sanchar portal. Rational timelines for each clearance should be defined. The portal should be well-integrated with all the ministries/ departments/ agencies involved. An option for bulk uploading of aggregate documents should be provided.*

(iii) *DoT should be the nodal agency for ensuring faster and time-bound grant of permissions by appropriately coordinating with the concerned departments/ ministries/ agencies.*

(iv) *DoT should constitute a committee comprising of representatives from ILDOs, DoT, DG Shipping, ONGC, Indian Navy and Department of Fisheries. The committee should review the international best practices and feasibility for identifying and declaring special corridor in Indian marine context. The existing Cable Landing Stations and associated routes, especially at Mumbai and Chennai may be considered by the said proposed Committee for declaring them as special corridors to avoid cable damages.*

(v) *DoT may consider mandating the International Long Distance Operators (ILDOs) owning cable landing station for submarine cables terminating in India to share details of the zones and/ or Route Position Locator (RPL) coordinates of submarine cables at least up to Indian Territorial Water and Exclusive Economic Zones ('EEZ') with the Department of Fisheries.*

3.49 The Authority acknowledges that the functioning of submarine cables is crucial for the uninterrupted transmission of signals, data, and communication across national and international borders. These cables play a vital role in maintaining communication networks, including voice, private leased circuits and high-speed internet services amongst various interconnected continents, sub-continents and countries. Any disruption in the operation or

functioning of these submarine cables can lead to significant disruptions in various essential services, such as telecommunication, healthcare, data connectivity, financial transactions, emergency communications, and national security. Thus, for ensuring the smooth operation, repair, and maintenance of submarine cables, accord of '*Critical and Essential Services*' certification will help boost the submarine data cable infrastructure and will considerably enhance international connectivity and consequently Indian economy.

3.50 As has been discussed, the Authority has already recommended in its EoDB recommendations that *Submarine cable laying and repair in Indian Territorial Water and Exclusive Economic Zones ('EEZ') of India and Cable Landing Stations in India should be classified as 'Critical and Essential services'. It should be given 'Top Priority' for obtaining necessary permission and security clearances from the ministries/ departments/ agencies involved.* In addition, the Authority also took note of the following submissions of few stakeholders stating that:-

a) Apart from accord of '*Essentiality Certificate*' (EC) issued in hydrocarbon E&P (Exploration and Production) sector by DGH (Directorate General of Hydrocarbons) under Ministry of Petroleum, certain GST related benefits have also been extended to Petroleum Operations. As per section 16 of CGST Act 2017, augmented with customs Notification No. 50/2017Cus and GST Notification No. 03/2017-Integarted Tax (Rate) of 28 June 2017, input tax credit at '***concessional rate of 5% GST'***, set off against '***18% GST***' has been allowed. To avail input tax credit that is payable on total value of works contract services including vessel (on submission of Charter agreement between Vessel Owners & operators), following conditions are applicable:

(i) The goods should be covered under list annexed with notification (specified goods).

(ii) Goods should be required for petroleum operations.

(iii) Submission of 'EC' issued by DGH to Customs/GST Authorities, and compliance of other conditions prescribed.

3.51 Drawing parallels, the Authority interacted with stakeholders and identified following list of key equipment in addition to the repair vessel, which are used in SMC systems comprising of cable landing station, front haul and undersea cable in Indian Territorial Waters (ITW) as well as in EEZ :

Table 3.1 : Key equipment used in SMC systems, including repairs

Sr. No.	Equipment Name	To be used in	Equipment Description
a.	Power Feeding Equipment	CLS	Power feeding equipment is used to provide electrical power to power up the repeaters, ROADM and Branching unit in wet segments
b.	Line Monitoring Equipment (LME)	CLS	LME is used to monitor the repeaters
c.	Command Response Equipment (CRE)	CLS	CRE is used to control the BU & ROADMs
d.	EMS server	CLS	EMS server is used to manage and monitor the CLS equipment
e.	Land Fibre Cable	Front haul	This is fibre cable which is used between Beach manhole (BMH) and CLS
f.	Land Power Cable	Front haul	This is power & earth cable to be used between BMH and CLS

g.	Tripod joint and associated kit	Front haul	This is joint box to be used at BMH
h.	Land cable joints and associated kit	Front haul	These are joints to be used to join the land cable
i.	Repeaters	ITW & EEZ	These are amplifiers in wet segment used to amplify the optical signal.
j.	Submarine Cable	ITW & EEZ	This is Submarine cable which is used from BMH towards sea to carry the power & optical signal
k.	Articulated pipes	ITW & EEZ	This is used to protect the Submarine cable in shallow water
l.	Gain shape equalizers & Tilt Equalizers	ITW & EEZ	Equalizers are used to equalize the gain and tilt
m.	Branching Unit	ITW & EEZ	Branching unit is used at trunk for each branch
n.	Wet ROADM	ITW & EEZ	Wet ROADM is used along with BU to selectively drop/pass the wavelength towards trunk/branch
o.	LBO	ITW & EEZ	An LBO is an element inserted in an optical or electrical path that provides loss to the signal passing through it.
p.	ePWF	ITW & EEZ	Predetermined wavelength filter

3.52 Stakeholders also brought out in their comments that Presently the Cable ship and onboard fittings and entire cargo are subject to customs duty while importing. However, the Cable ship and onboard fittings are exempted from payment of Customs duty & IGST, in

accordance with sub para 557 (C) of notification 50 of 2017 dated 30-06-2017, as promulgated vide notification no. 34 of 2019 dated 30.09.2019. However, the 'NIL' Customs duty and IGST on Cable Laying / repair ship is applicable on compliance of Condition 105 to be submitted by the Importer, on assessment of duty, wherein the importer needs to submit a bond. The importation/ re-export formalities need to be complied for cable repair/ laying vessels while operation in 'Indian Customs Waters'. Apart from the cable ship and onboard fittings, the Equipment, stores, consumables, provisions, bunkers etc. are liable for payment of Customs Duty and IGST as per rates (HS Codes) for each item while operating in 'Indian Customs Waters'. IGST is payable on Cable Laying/ Cable repair Services at specified rates, which is presently @18% on such costs. After the repair operation is completed, while the vessel is getting re-exported, again there is a need to submit the "Bill of entry" for the reported Cargo and Bunker. The Authority is of the view that it is a very open ended and ambiguous practice as the ship owners are mostly non-Indian and for them furnishing a bond with a fear of the ship likely getting impounded due to wrong filing is always a challenge. The requirement of bond and 'bill of entry' submission arises because the items used for repairs are being subject to custom duties and IGST. The Authority, therefore, is of the view that this ambiguous practice further escalates the cost and time for the laying/ repair of the SMCs in Indian waters.

3.53 The Authority is of the opinion that CLS operation along with SMC layout, repairs and maintenance being critical and essential asset of the nation to provide international connectivity, duties and taxes levied on repair vessel, goods and items required for submarine cable layout, repairs and maintenance services as tabulated above, should be exempted from custom duty and GST. As far as IGST is concerned the tax collection on the SMC laying and maintenance activity, that happens rarely in a year, will be miniscule in

comparison to the cost escalations that happen due to difficult and lengthy approval process. There are overall costs to the economy when the SMCs are down or not installed in time. SMC systems are critical infrastructure that have strategic importance to nation and installation and repair of SMCs need to be looked beyond revenue earning/tax collection angle. Given the cost to the overall economy in comparison to the benefit of collecting a small amount of tax, the Authority feels that it is better to exempt the SMC systems from custom and IGST applicability.

3.54 In view of the above, the **Authority recommends that, given the importance of SMC systems for connectivity as well as security of the country, CLS operations along with its associated activities such as layout, maintenance and repairs of Submarine Cables should be accorded 'Essential Services' status. For the same, DoT should coordinate with appropriate government authorities. Also, DoT should coordinate with National Critical Information Infrastructure Protection Centre (NCIIPC) for notifying these services as 'Critical Information Infrastructure' (CII). DoT should also approach Ministry of Finance for creating special provisions towards goods and items enlisted at table 3.1 above (or any other relevant item(s)) for exemption from custom duty and GST that is payable on total value of works contract services including vessel (on submission of Charter agreement between Vessel Owners & operators) in ITW and EEZ.**

3.55 The Authority also recommends that DoT should take up with Department of Revenues for doing away with the requirement of submitting a bond by Cable ship repair vessels for availing Customs duty exemptions as imposed by condition 105 of notification no. 34 of 2019 dated 30.09.2019 of Ministry of Finance

3.56 In response to the above questions, some stakeholders have stated that following charges paid to other TSPs may be allowed as pass-

through, as it will encourage infrastructure sharing between various licenses: -

(a)Charges paid by one TSP to another TSP for sharing its network.
(b)Annual Access Facilitation Charges at CLS/Alternative Locations.
(c) Annual Operation & Maintenance Charges at CLS/Alternative Locations.
(d) Co-location charges.

3.57 A few stakeholders are of the view that taxes should be charged up to 12 nautical miles only, which are the limits of territorial waters.

The following measures have been suggested by one or few stakeholders: -

a) Create one or more cable protection zone/ corridor. Also monitoring agency to track activities to protect the submarine cables.

b) Streamline clearance and permit process, single window clearance.

c) The LIM requirement approach in new high capacity needs to be reviewed and revisited. Also, with advent of CMS, onus of LIM by ILDOs may be removed.

d) Custom duties and TAX on submarine cables should be charged NIL or at the most 5% for all types of submarine cable landing in India.

e) Indian ships can introduce escort ship services to quickly allow outside marine ships and crews.

f) India can also promote investment in submarine cables by collaborating with other countries and international organizations.

3.58 Few stakeholders have submitted that there is onerous requirement of a mandatory presence of DoT officials for naval onshore surveys. The activity of capturing GPS co-ordinates currently performed by the DoT official can be included in the work scope of the service provider. The stakeholders have also submitted that the marine

permissions for carrying out surveys from various agencies are time barred and any deviation due to unavailability of DoT officials leads to unnecessary delays which may also lead to incremental costs. There are additional expenses incurred by service provider for training, insurance etc. as well as the risk attached with travel on high seas for the DoT official. The stakeholders have requested for dispensing with the requirement of physical presence of DoT official for onshore survey.

Analysis and view of the Authority

3.59 The Authority noted that most of the suggestions of stakeholders have been discussed and examined in the above paras against question no. 1. The suggestions related to EoDB have already been dealt with by the Authority in its Recommendations on "Ease of Doing Business in Telecom and Broadcasting Sector" dated 02 May 2023. Regarding submissions of the stakeholders on charges paid to other TSPs to be allowed as pass-throughs would need a separate consultation process. Hence the matter of AGR and pass through would be reviewed through a separate consultation paper.

3.60 It is further learnt that mandatory presence of DoT officials onboard survey ships/ vessels is part of the conditions specified by MoD while according clearance to the ship/ vessel, to ensure that survey data is collected under the supervision of DoT official. The Authority is of the view that the work of capturing GPS co-ordinates during Naval onshore surveys may be entrusted to the concerned licensee.

3.61 The Authority is of view that considering the submarine cable and CLS as a critical and strategic asset of digital communication network, a section should be added in the Indian Telecommunication Bill, 2022 to promote, protect and prioritize 'Cable Landing Station' and 'submarine cable' in India. Also, the damage to sub-sea infra should be considered as damage to critical

infrastructure of national importance and be taken strictly under the India laws.

3.62 Some of the suggestions against Question 1 & 9 also relate to incentivizing setting up of CLS in India. NDCP 2018 envisaged 'Introducing various fiscal and non-fiscal benefits for development of telecom clusters around cable landing stations to foster innovation in Digital Communications Technologies' under Propel India mission. The Authority would like to mention that the issue of incentivizing setting up of CLS has been dealt in its Recommendations on 'Regulatory Framework for Promoting Data Economy Through Establishment of Data Centres, Content Delivery Networks, and Interconnect Exchanges in India'. The Authority had recommended that other coastal states intending to promote setting up of Cable Landing Stations (CLS) may consider incentives and facilitations as has been undertaken by the State of Gujarat in its IT/ITeS Policy 2022-27. However, the Authority feels that there is a possibility that the State Governments may not be aware of finer nuances of License requirements etc. for building CLS.

3.63 In view of the above, the **Authority recommends the following:**

(i) The Authority recommends that DoT should expedite the implementation of recommendations made by TRAI on SMC related issues in its recommendation on "Ease of Doing Business in Telecom and Broadcasting Sector" dated 02 May 2023. In addition to various SMC related clearances mentioned in those recommendations, the Authority also recommends that the clearances related to Environmental Impact Assessment (EIA) and Coastal Regulation Zone (CRZ) may also be made online as a part of Saral Sanchar portal.

(ii) The Authority also recommends that in place of mandatory presence of DoT officials onboard, DoT may pursue it with the MoD that survey data be collected under supervision of MoD and

Indian representatives/ responsible Licensee officials, who shall ensure appropriate safeguards.

(iii) The Authority recommends that considering the submarine cable and CLS as a critical asset, a section should be added in the Indian Telecommunication Bill, 2022 to promote, protect and prioritize 'Cable Landing Station' and 'submarine cable' in India. Also, the damage to sub-sea infra should be considered as damage to Critical Infrastructure of national importance and be strictly dealt under the India laws.

(iv) The Authority reiterates its recommendation on "Regulatory Framework for Promoting Data Economy Through Establishment of Data Centres, Content Delivery Networks, and Interconnect Exchanges in India" that "other coastal states intending to promote setting up of CLS may consider incentives and facilitations as has been done by State of Gujarat in its IT/ITeS Policy 2022-27".

(v) DoT should take up with the State Governments that any incentive should be provided to only such ILD / ISP Category-A (with International Gateway permission) Licensee who has a valid agreement to land cable with consortium that owns SMC or with a company that privately owns full cable.

(vi) The Authority reiterates its recommendation on "Regulatory Framework for Promoting Data Economy Through Establishment of Data Centres, Content Delivery Networks, and Interconnect Exchanges in India" that "RoW charges for laying and maintaining OFC infrastructure to CLS may be waived off for encouraging and supporting the new CLS establishment for submarine cables".

CHAPTER 4

INTERNATIONAL PRACTICES RELATED TO SUBMARINE CABLES AND CLS

4.1 The chapter analyses the practices adopted by other counties namely USA, Singapore, Australia, UAE, and Canada for regulating submarine cables landing in their countries/territorial waters and cable landing station. Most of these countries are fast-growing nations and have vast coastlines like India.

AUSTRALIA:

4.2 Australia has the concept of a protection zone and a non-protection zone for submarine cable landing in their country. For laying an international cable, a permit is required irrespective of the zone the cable will be laid in. While laying a domestic cable, a permit is required only when the cable is being laid in the protection zone.

4.3 Australian Commission and Media Authority (ACMA) has declared three submarine cable protection zones: Northern Sydney, Southern Sydney and Perth protection zone. The ACMA issues a permit to the telecom service providers (TSP) to install[16]:-

(i) an international submarine cable inside or outside a protection zone. A "protection zone permit" for the installation to be done in the protection zone while for other zone a "non-protection zone permit" is required.

(ii) a domestic submarine cable in a protection zone.

(iii) A permit is not needed to install a domestic cable outside a protection zone. A permit is needed for domestic cable only when the installation is done in the protection zone.

[16] https://www.acma.gov.au/rules-operating-around-submarine-cables

4.4 An application for a permit must be accompanied by payment of the appropriate charge per cable and the consultancy deposit (if applicable) as shown below in Table **4.1**. Once a permit is issued, it is valid for a period of 18 months. The permit can be extended for 180 days. There is no limit on the number of times the permit can be extended. Each time a non-refundable fee of $1414 should be submitted for the request. The decision for the extension will be taken by the authority.

Table 4.1: Application Charges in Australia

	Application Charge Per Cable	Consultancy Deposit
Protection zone permit	$4040	n/a
Non-protection zone permit	$5959	$25,000

4.5 The ACMA is required to either grant or refuse an application for a permit within the following timeframes:

- Protection zone permit – 25 business days after the day the application for the permit was received. The ACMA may extend this period up to, but not exceeding, 35 business days.
- Non-protection zone permit – 60 business days after the day the application for the permit was received. The ACMA may extend this period up to, but not exceeding, 90 business days.

SINGAPORE:

4.6 The Info-communications Media Development Authority (IMDA) of Singapore is the nodal agency for facilitating the deployment of submarine cable systems in Singapore. All new submarine cable systems, on a first-come-first-served basis, can only be deployed to designated landing sites. The IMDA provides guidance to interested parties and facilitates the process of applying for the necessary permits from various authorities. A set of guidelines is issued to

provide an overview of the process for obtaining the necessary approvals and permits for the deployment of the submarine cable. There are five key steps that an interested party has to go through in order to land a submarine cable system in Singapore.

Table 4.2: Time required for obtaining clearances from the respective body in Singapore

S. No.	Steps to be followed	Time Required
1	Facilities-Based Operations (FBO) licence	Four weeks
2	Consultation with the Maritime Port Authority (MPA)	-
3	Application to the Urban Redevelopment Authority (URA)	Two to Three months
4	Application to MPA (Committee for Marine Projects)	Three weeks
5	Application to Singapore Land Authority (SLA) for Wayleave and Temporary Occupational licences	Eight weeks

4.7 IMDA grants the Facilities Based Operational (FBO) license for laying based on the financial viability of the project and the value addition done by the cable to the communication industry and the economy. IMDA also ensures efficient use of land resources and sea corridors while installing new cables.

4.8 For acquiring the FBO license, the applicant is required to submit a cable landing proposal to the Authority that includes a detailed description of the new cable system, the business plans and details of the proposed deployment route and choice of the landing site. The applicants who already hold an FBO license will have to seek approval to amend the FBO license to include details of the proposed submarine cable system and the associated services.

4.9 In general, the IMDA's assessment for the new submarine cable deployment is based on the following considerations:

- Financial viability of the project and benefits that the new submarine cable system will bring to its information & communications industry, consumers, and the economy in Singapore, and

- Efficient usage of land resources and sea corridors in the submarine cable deployment. Applicants are encouraged to plan to deploy spare cable fibres together with the new submarine cable system to cater for the future expansion of new submarine cable routes. The Authority looks favorably to new methods of cable deployment that can result in more efficient use of land resources and sea corridors.

CANADA:

4.10 The submarine cable licenses in Canada are based on either the cable traffic connected to telecommunication facilities in the country or the transit traffic that will simply pass through[17]. There are two types of international submarine cable licenses issued by the Government of Canada.

- Terminating cable licence: The licence is for cables that connect to or are planned to be connected to telecommunications facilities in Canada and extend between any location inside and outside of the country.

- Through cable licence: The license is for the cables that extend through Canada between places outside Canada and do not connect to telecommunications facilities in Canada.

4.11 The international submarine cable licenses are issued for the purpose of building or operating an international submarine cable landing in Canada, including any related works or facilities. The applicant should have administrative and operational control of the international submarine cable, including its associated works or

[17] International Submarine Cable Licenses Regulations (justice.gc.ca)

facilities, to be eligible for acquiring the terminal cable license. An applicant must pay, at the time of filing the application, a fee of $100 for the first year of the term of the licence and for each subsequent year of the term of the licence is $100.

UNITED STATES:

4.12 A Cable landing license is required to land or operate a submarine cable in the United States. The Cable Landing License Act[18] in the US prohibits operating or landing any submarine cable that directly or indirectly connects the United States to any foreign nation or that connects one part of the United States to another unless the President of the United States has issued a written license authorizing the landing or operation of such a cable. The cables having both terminals entirely within the continental United States are exempted from the Act's restrictions.

4.13 The Federal Communications Commission, FCC's International Bureau, Telecommunications and Analysis Division (TAD)[19] grants licenses authorizing cable landing license applicants to own and operate submarine cables and associated landing stations in the United States[20]. The applicants applying for the license must be any particular entity that owns or controls a cable landing station in the U.S., and all the other entities must own a five per cent or greater interest in the cable system. Applicants should be mindful of the technical and ownership information required by the rules, as well as the requirement to state in the application whether the proposed cable will be operated on a common carrier or non-common carrier basis. Proposed non-common carrier operation must be accompanied by information showing that the proposed operation satisfies the

[18] https://www.fcc.gov/cable-landing-license-act
[19] https://www.fcc.gov/submarine-cable-landing-licenses-granted
[20] https://www.fcc.gov/research-reports/guides/submarine-cable-landing-licenses

requirements set forth in the National Association of Regulatory Utility Commissioners.

4.14 A cable landing license must be obtained prior to landing a submarine cable to connect:

(i) The continental United States with any foreign country.

(ii) Alaska, Hawaii or the U.S. territories or possessions with a foreign country, the continental United States, or with each other; and

(iii)Points within the continental United States, Alaska, Hawaii or a territory or possession in which the cable is laid within international waters.

4.15 Applications for cable landing licenses are subject to initial review for completeness of the information and, upon acceptance for filing, public notice inviting comment. The Commission's rules provide for streamlined processing with the action within 45 days of the release of the public notice where the applicant can demonstrate eligibility for streamlining under the Commission's rules. The Commission will undertake to act on applications that are ineligible for streamlining within 90 days of issuance of a public notice unless the application raises questions of extraordinary complexity.

4.16 All licensees of international submarine cables (those submarine cables that connect the United States with international points) are required to pay annual regulatory fees for the submarine cable system. The Commission conducts a rulemaking proceeding each year to determine the amount of the regulatory fee for that year.[21] [22]

UAE (United Arab Emirates):

4.17 In UAE there are two permits for both terrestrial cable as well as international submarine cable– (i) Permit to install and (ii) Permit to remove the cable. The same permit is issued for installing the

[21] https://www.fcc.gov/submarine-cables
[22] http://www.fcc.gov/fees/regfees.html.

terrestrial cable in the UAE and the submarine cable in the Territorial Waters. The installation permit is valid for the lifetime of the cable.

4.18 The Board of the Telecommunications and Digital Government Regulatory Authority (TDRA)[23], UAE has recently issued "The TDRA's International Telecommunications Cable Regulations" or the "ITC Regulations" in the UAE. These regulations clarify the rules regarding installing, laying, maintaining, and removing International Telecommunications Cables in the UAE (including the Territorial Waters of the UAE) and to qualify, by way of Permits, persons other than Qualified Licensees involved in installing, landing, connecting, adjusting, maintaining, and the like., . There are two different types of permits issued by the TRDA:

(i) **Permit to Install:** The Permit is valid for the lifetime of the concerned cable, and which authorizes the Permit Holder to install and maintain:

- a Terrestrial Telecommunications Cable in the UAE, and if appropriate to seek Interconnection at a Terrestrial International Cable Gateway; or
- a Submarine Telecommunications Cable in the Territorial Waters of the UAE, and if appropriate to land the STC and to seek Interconnection at a Licensed Cable Landing Station.

(ii) **Permit to Remove:** A Permit which authorizes the Permit Holder to remove or decommission permanently or temporarily – as specified in the Permit:

- a Terrestrial Telecommunications Cable; or
- a Submarine Telecommunications Cable.

4.19 TDRA for promoting transit traffic has defined the following: -

[23] Regulations and Ruling - TDRA

(i) Transit Submarine Telecommunications Cable means – a type of Submarine Telecommunications Cable which enters, crosses, and leaves the Territorial Waters of the UAE without landing in the UAE.

(ii) Transit Terrestrial Telecommunications Cable means – a type of Terrestrial Telecommunications Cable which enters, crosses, and leaves the UAE without being connected to a Terrestrial International Cable Gateway or any telecommunications networks in the UAE.

Table 4.3: - Summarized international practices related to submarine cable landing in the aforementioned countries

S. No.	Country	Commissioned Authority for issuing submarine cable landing permits	No. of Submarine cable systems (operating or under planning)	Equity condition for the submarine cable laying in the country	Entry / Application / license fee	Special provision for domestic cables	Provision for stub-cable	Provision of special corridor or protection zone
1.	Australia	Australian Commission and Media Authority (ACMA)	19	No	$4040 (Protection zone) and $5959 (non-protection) as an application fee permit valid for 1.5 years ($1414 for extension of the permit for 6 months)	Yes	No	Yes
2.	Singapore	Info-communications Media Development Authority	25	No	Processing fee, security deposit, etc.	No	Yes	Yes
3.	Canada	Government of Canada	16	No	Fee of $100 for the first year of the term and $100 for each subsequent year	No	No	-
4.	USA	Federal Communications Commission (FCC)	83	Yes (5% or more in the cable ownership)	Regulatory fee as applicable for each subsequent year of the license	Yes	No	-
5.	UAE	Telecommunications and Digital Government Regulatory Authority (TDRA)	2	No	Permit fee and the permit is valid for lifetime of the cable	No	No	-

CHAPTER 5

SUMMARY OF RECOMMENDATIONS

5.1 The Authority recommends that:

(i) ILD / ISP Category 'A' authorization (with International Internet Gateway) license should be amended to include two categories of Cable Landing Station (CLS) locations – (a) Main CLS and (b) CLS Point of Presence (CLS-PoPs). The Owner of the Main CLS would be required to seek all the permissions/clearances related to the SMC landing in their CLS in India. They will also be required to inform Licensor/TRAI about all CLS-PoP locations and their owners.

(ii) The ILD / ISP Category 'A' (with International Internet Gateway) licensees will be allowed to get access and extend their owned or leased dark fibre pair(s) in the submarine cable from the main CLS to their respective CLS-PoP location. Submarine Line Terminal Equipment (SLTE) for the extended dark fibre pairs with or without PFE (Power Feeding Equipment) should be permitted at these CLS-PoP locations. The owners of CLS-PoPs will not be required to seek CLS establishment permissions/clearances that the owners of main CLS will seek. However, owners of CLS-PoPs will be required to fulfil all other security and regulatory/ license obligations including reporting requirements and establishment of LIM facility.

(iii) The revised detailed guidelines and applications for setting up main CLS and CLS-PoPs respectively, for submarine cables landing in India under respective ILD and ISP License /authorization inter-alia, incorporating provisions as per these recommendations, be issued and made available on DoT website.

[Para. 2.35]

5.2 The Authority recommends that any ILD or ISP Category 'A' authorization (with International Internet Gateway) Licensee who applies for seeking permissions for establishing main Cable Landing Stations (CLS) should submit an undertaking that they own and control the asset in Indian Territorial Waters (ITW) and at CLS. Such undertaking should be backed by either proof of ownership of the submarine cable (SMC) assets as well as the assets at CLS OR by a signed agreement with SMC owner/consortium to this effect.

[Para 2.41]

5.3 The Authority recommends that: -

(i) DoT should constitute a committee comprising government representatives (from DoT, Ministry of Shipping, Shipyards at Kochi/Visakhapatnam/Mumbai, MHA, Department of Revenue (MoF), and major ILDOs having stake in SMC to study and recommend the different financial viability models for Indian Flagged Repair Vessels including possible incentives from Government.

(ii) As a stop gap arrangement, SMC ship repair operators active in Indian Sub continental region may also be approached by this Committee to persuade them to relocate and reflag their repair vessels at suitable Indian ports as per requirement.

(iii) Cable Depot should be identified in both west and east coastline for storing submarine cable and the necessary equipment/ kit for carrying out cable repairs. The depot should be situated at a location near to existing or upcoming CLS to facilitate rapid response times to complete cable repairs. Also, these Cable Depots should provide a strategic base for Indian Flagged Vessels in future.

(iv) The committee proposed at para (i) above, should also be entrusted with the task of suggesting ways and means to

facilitate and incentivize setting up of these 'Cable Depots', inter-alia, considering the following:

a. **Giving same status to 'Cable Depots' as that enjoyed by SEZs and exempting the repair material stored in these depots from provisions of GST/custom.**
b. **Possibility of collaboration with coastal states who intend to promote vessels/ cable depot and SMC system and consider providing incentives in form of Land bank for 'Cable Depot'.**
c. **Possibility of collaboration with Central and State Port Authorities and Shipyards for allocation of land and other facilitations for 'Cable Depot'.**

(v) The crew members in the survey/repair vessel for submarine laying and repair work having valid work permit of India may be exempted from obtaining clearances repeatedly during permit period.

(vi) DoT with other agencies that are involved in giving various permissions for SMC installation and repair activities may examine the possibility of auto renewal option in cases where there is no change in the data provided for getting permissions for SMC related activity. The option of taking only such data that has changed since grant of last permission may also be examined.

[Para. 2.75]

5.4 The Authority recommends that following provisions may be made under NLD and ILD License/authorization:-

(i) NLD licensee may be allowed to establish, own, maintain, and operate domestic submarine cables connecting two or more cities on the Indian coastline and to set up CLS for landing of such domestic submarine cables as per following conditions –

a) Domestic traffic through submarine cables will be allowed.

a) **Wherever required, the Domestic Submarine cable may be permitted to go beyond ITW or EEZ of India for techno-commercial benefits.**

b) **Equal access to facilities at the Cable Landing Stations (CLS) including landing facilities for submarine cables of other NLD license operators on the basis of non-discrimination shall be mandatory.**

c) **Access/ Co-location at the CLS shall be governed by the orders/regulations/directions issued by TRAI from time to time.**

(ii) **The domestic and international cables can terminate at the same CLS but with each cable having its own separate network element/ equipment (PFE and SLTE). A physical separation of terminating equipment for domestic and international traffic should be maintained.**

(iii) **Such CLS where both domestic and international cables are terminated, should be owned, and operated by integrated players (having both ILD and NLD license/authorization). The requirement of necessary LIM should be based on the nature of traffic carried, being NLD or ILD and owners of CLS should maintain physical separation for terminating domestic and international traffic.**

(iv) **International Submarine Cable should be allowed to carry domestic traffic on dedicated fibre pairs that are provisioned between two Indian cities. Licensee should ensure that such traffic is not transited/ routed through any other country outside India.**

[Para. 3.19]

5.5 The Authority recommends that: -

(i) **ILD and NLD licenses should explicitly mention that terrestrial connectivity between different CLSs is permitted.**

(ii) ILD license should explicitly clarify that transit international traffic not meant to be terminated in India will be permitted to be transited to other submarine cables through terrestrial as well as submarine cable links.

[Para. 3.29]

5.6 The Authority recommends that ILD / ISP Category 'A' license/authorization should be amended to allow these licensees to lay stub-cable (pre-laid dark fibre SMC) and either terminate them in their existing CLS or establish new CLS for such stub-cable with prior-permission of licensor. The following terms and conditions will be applicable for stub-cable:

a) The stub cables can be laid up to any distance within EEZ.

b) The owner of Stub-cable must disclose the details of used and unused dark fibre pairs to licensor/ TRAI annually and seek prior approval from licensor for using/ sharing these dark fibres to other eligible ILDOs/ISPs.

c) The owner of stub must provide access of stub-fibre pair(s) on fair and non-discriminatory basis.

d) The owner of stub will be allowed to transfer the ownership of stub, if required, to other eligible seeker ILDOs/ ISPs with prior permission from licensor. Once a stub-cable is transferred to the new owner, the new owner intending to use the stub-cable infrastructure for onward termination of cable into India will be responsible for the LIM and other applicable regulatory compliances post the integration of stub cable fibre pairs for end-to-end cable system and its operations.

[para 3.44]

5.7 The Authority recommends that, given the importance of SMC systems for connectivity as well as security of the country, CLS operations along with its associated activities such as layout, maintenance and repairs of Submarine Cables should be

accorded 'Essential Services' status. For the same, DoT should coordinate with appropriate government authorities. Also, DoT should coordinate with National Critical Information Infrastructure Protection Centre (NCIIPC) for notifying these services as 'Critical Information Infrastructure' (CII). DoT should also approach Ministry of Finance for creating special provisions towards goods and items enlisted at table 3.1 above (or any other relevant item(s)) for exemption from custom duty and GST that is payable on total value of works contract services including vessel (on submission of Charter agreement between Vessel Owners & operators) in ITW and EEZ.

[Para. 3.54]

5.8 The Authority also recommends that DoT should take up with Department of Revenues for doing away with the requirement of submitting a bond by Cable ship repair vessels for availing Customs duty exemptions as imposed by condition 105 of notification no. 34 of 2019 dated 30.09.2019 of Ministry of Finance

[Para. 3.55]

5.9 The Authority recommends the following:

(i) The Authority recommends that DoT should expedite the implementation of recommendations made by TRAI on SMC related issues in its recommendation on "Ease of Doing Business in Telecom and Broadcasting Sector" dated 02 May 2023. In addition to various SMC related clearances mentioned in those recommendations, the Authority also recommends that the clearances related to Environmental Impact Assessment (EIA) and Coastal Region Zone (CRZ) may also be made online as a part of Saral Sanchar portal.

(ii) The Authority also recommends that in place of mandatory presence of DoT officials onboard, DoT may pursue it with the

MoD that survey data be collected under supervision of MoD and Indian representatives/ responsible Licensee officials, who shall ensure appropriate safeguards.

(iii) The Authority recommends that considering the submarine cable and CLS as a critical asset, a section should be added in the Indian Telecommunication Bill, 2022 to promote, protect and prioritize 'Cable Landing Station' and 'submarine cable' in India. Also, the damage to sub-sea infra should be considered as damage to Critical Infrastructure of national importance and be strictly dealt under the India laws.

(iv) The Authority reiterates its recommendation on "Regulatory Framework for Promoting Data Economy Through Establishment of Data Centres, Content Delivery Networks, and Interconnect Exchanges in India" that "other coastal states intending to promote setting up of CLS may consider incentives and facilitations as has been done by State of Gujarat in its IT/ITeS Policy 2022-27".

(v) DoT should take up with the State Governments that any incentive should be provided to only such ILD / ISP Category-A (with International Gateway permission) Licensee who has a valid agreement to land cable with consortium that owns SMC or with a company that privately owns full cable.

(vi) The Authority reiterates its recommendation on "Regulatory Framework for Promoting Data Economy Through Establishment of Data Centres, Content Delivery Networks, and Interconnect Exchanges in India" that "RoW charges for laying and maintaining OFC infrastructure to CLS may be waived off for encouraging and supporting the new CLS establishment for submarine cables".

[Para 3.63]

Annexure-I

Government of India
Ministry of Communications
Department of Telecommunications
Sanchar Bhawan, 20 Ashoka Road New Delhi – 110001
(Carrier Services Cell)

No. 10-54/2010-CS-III (Pt.) **Dated:** 12.08.2022

To,

The Secretary
Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan, (Old Minto Road)
New Delhi -110002

Subject: Issues related to laying and maintenance of Submarine cables - Seeking Recommendations as per TRAI Act under Section 11(1)(a).

Department have been issuing ILD Licenses from 2002 onwards. These Licenses are authorised to set up their Cable Landing Stations (**CLS**) and to lay submarine cables in India for providing international connectivity. Recently, it has been noticed that in some cases the Indian ILDOs do not have any stake in the submarine cable, however, they are acting as landing party in India for these cables.

2. In response to the directions of DoT regarding stake in submarine cables, concerns have been raised by the ILDOs that enforcing condition of equity/ stake in submarine cables can put the country on disadvantageous position for international connectivity. A Background Note on issues related to laying and maintenance of Submarine Cables is attached as **Annexure.**

3. It is requested to give recommendations on licensing framework and regulatory mechanism for submarine cables landing in India within existing UL-ILD/ Standalone ILD License under section 11(1)(a) of TRAI Act 1997. TRAI is also requested to examine global practices adopted by other countries for regulating submarine cables landing in their countries/territorial water while giving these recommendations.

This issues with the approval of Hon'ble MoC.

12/08/22

(Pradeep Kumar)
Dir(CS-III)
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Enclosed: Background Note

Annexure

Background Note on issues related to laying and maintenance of Submarine Cables

As per the current Telecom licensing regime, the International Long Distance Operators (**ILDOs**) licensees are allowed to set up Cable Landing Station (**CLS**) for landing of Submarine cables. Relevant clauses of ILD license are as below:

Clause 2.6, chapter XI of the Unified License (**UL**),
"2.6 The Licensee may establish Cable Landing Station (CLS) for submarine cable with prior permission of Licensor for which a separate application is to be submitted in the prescribed proforma."

Clause 2.7, chapter XI of the UL,
"2.7 Equal access to bottleneck facilities at the Cable Landing Stations (CLS) including landing facilities for submarine cables ***for licensed operators*** *on the basis of non-discriminatory shall be mandatory."*

2. Since provisions to set up CLS are not available in any other chapter of UL, the department is granting permission to set up CLS only to ILDOs in consultation with LEAs. Further, as per clause 2.7 submarine cables of **only licensed operators** can land on such CLSs, thus the entity laying any submarine cable shall either be an ILD licensee in India or have an Indian ILDO as its member.

3. TRAI in its recommendations *"Measures to promote competition in International Private Leased Circuits (IPLC) in India"* dated 16.12.2005, deliberated this issue also in detail and inter-alia concluded at para 5.4.1:

> *".....As the international cable system comprises of wires and appliances and is capable of use for transmission of signal, it is covered as a telegraph system within the meaning of Section 3 (1). Therefore, a license under the ITA, 1885 would be required to bring an international cable through the territorial waters and to land on the shore of our country...."*

4. Vide these recommendations, TRAI had recommended that any international cable carrier who does not hold an ILDO license in the country, should be licensed under the Indian Telegraph Act, 1885 under a new category of infrastructure providers named as 'International Infrastructure Provider' (**IIP**) with the sole objective to provide international connectivity only to ILDOs licensed in India. These recommendations were examined in the Department at that time but this point of recommendations could not be agreed to.

5. Recently, it was noticed that in some cases the Indian ILDOs do not have any stake in the consortium owning submarine cable but they are seeking MHA/ MoD clearances on behalf of the cable consortiums for laying/ maintaining such cables. Further, they are also applying for setting up of CLS for such submarine cables. Clarifications were sought from ILDOs regarding ownership and some ILDOs have reported that they do not have any stake in the consortium who owns the submarine cable.

6. In view of above, following directions were issued to ILDOs:

i. The company laying submarine cables have to ensure that it holds a valid ILD licence issued by Department of Telecommunications, Government of India while entering into the Indian territorial waters. In case a consortium is laying submarine cables, they shall ensure that any member of their consortium holds a valid ILD licence issued by Department of Telecommunications, Government of India while entering into the Indian territorial waters.

ii. The ILD licensees, licensed in India, while applying for Security clearances (i.e. MHA/ MoD clearance) on behalf on any entity for laying/ maintaining the submarine cables, shall make sure that they have significant stake in such entities on behalf of whom they are applying for security clearances else they don't have any locus standi in the case.

7. After issuance of these instructions, some of the ILDOs have started claiming that the portion of submarine cable lying in Indian territorial waters is being owned by them. On further enquiry by CS wing, they submitted copies of agreements signed by them with consortium members (signed at later dates in some cases). For further examination copies of asset registers were also sought from ILDOs. However, no clear conclusion could be drawn and since the MHA/ MoD clearances were getting delayed, clearances were issued to ILDOs by CS wing due to the urgent maintenance requirements and based on the statements of ILDOs that they own these assets in Indian territorial waters.

8. Though the ILDOs have undertaken that they own the assets lying in Indian territorial waters, however, concerns are being raised by the industry that enforcing stake condition in submarine cables can put the country on disadvantageous position for international connectivity and have urged DoT not to mandate this condition. It is felt that a wider consultation is required on the issue so that a decision best suited to the sector can be taken.

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LIST OF ACRONYMS

S. No.	Acronym	Description
1.	4G	Fourth Generation technology
2.	5G	Fifth Generation technology
3.	ACMA	The Australian Commission and Media Authority
4.	AFC	Access Facilitation Charges
5.	AGR	Adjusted Gross Revenue
6.	BMH	Beach Manhole
7.	BU	Branching Unit
8.	CANI	Chennai-Andaman and Nicobar Island Cable
9.	CAPEX	Capital Expenditure
10.	CDN	Content Delivery Network
11.	CGST	Central Goods and Services Tax
12.	CII	Critical Information Infrastructure
13.	CLS	Cable Landing Station
14.	CLS-PoP	Cable Landing Station – Point of Presence
15.	CMS	Central Monitoring System
16.	CP	Consultation Paper
17.	CRE	Command Response Equipment
18.	CRZ	Coastal Regulation Zone
19.	DC	Direct Current
20.	DGH	Directorate General of Hydrocarbons
21.	DG Shipping	Directorate General of Shipping
22.	DoT	Department of Telecommunication
23.	E&P	Exploration and Production
24.	EC	Essentiality Certificate

25.	EEZ	Exclusive Economic Zone
26.	EIA	Environmental Impact Assessment
27.	EMS	Element Management System
28.	EoDB	Ease of Doing Business
29.	FBO	Facilities-Based Operations
30.	FCC	Federal Communications Commission
31.	FOREX	Foreign Exchange
32.	FP	Fibre Pair
33.	Gbps	Gigabits per second
34.	GPS	Global Positioning System
35.	GST	Goods and Services Tax
36.	IGST	Integrated Goods and Services Tax
37.	ILD	International Long Distance
38.	ILDO	International Long-Distance Operator
39.	IMDA	Info-communications Media Development Authority
40.	IP -I	Infrastructure Provider Category I
41.	IPLC	International Private Leased Circuit
42.	ISP	Internet Service Provider
43.	IT/ITeS	Information Technology Enabled Services.
44.	ITA	Indian Telegraph Act
45.	ITC	International Telecommunications Cable
46.	ITU	International Telecommunication Union
47.	ITW	Indian Territorial Water
48.	JV	Joint Venture
49.	KLI	Kochi-Lakshadweep Island
50.	LEAs	Law Enforcement Agencies
51.	LIM	Lawful Inception Monitoring

52.	LME	Line Monitoring Equipment
53.	LOU	Letter Of Undertaking
54.	Mbps	Megabit per second
55.	MIU	Minimum Investment Unit
56.	MHA/MOHA	Ministry of Home Affairs
57.	MoD	Ministry of Defence
58.	MoEF&CC	Ministry of Environment, Forest and Climate Change
59.	MTBF	Mean Time Between Failure
60.	NCIIPC	National Critical Information Infrastructure Protection Centre
61.	NDCP	National Digital Communications Policy
62.	NEC	Nippon Electric Company, Limited (Japan)
63.	NKT	Nordisk Elektrisk Ledningstraad og Kabel-Fabrik (Denmark)
64.	NLD	National Long Distance
65.	NLDO	National Long-Distance Operator
66.	O&M	Operation and Maintenance
67.	OCLS	Owner of Cable Landing Station
68.	OFC	Optical Fibre Cable
69.	OHD	Open House Discussion
70.	ONGC	Oil and Natural Gas Corporation
71.	OPEX	Operational Expenditure
72.	OTT	Over-The-Top
73.	PoP	Point of Presence
74.	PFE	Power Feeding Equipment
75.	PNF	Predetermined wavelength filter
76.	RFS	Ready for Service
77.	RIO	Reference Interconnect Offer

78.	ROADM	Reconfigurable Optical Add/Drop Multiplexer
79.	RoI	Return on Investment
80.	RoW	Right of Way
81.	RPL	Route Position Locator
82.	SEAIOCMA	South-East Asia and Indian Ocean Cable Maintenance Agreement
83.	SEZ	Special Economic Zone
84.	SLTE	Submarine Line Terminal Equipment
85.	SMC	Submarine Cable
86.	STC	Submarine Telecommunication Cable
87.	TAD	Telecommunications and Analysis Division
88.	TAT	Turn Around Time
89.	Tbps	Terabits per second
90.	TDRA	Telecommunications and Digital Government Regulatory Authority
91.	TERM	Telecom Enforcement Resource and Monitoring
92.	TRAI	Telecom Regulatory Authority of India
93.	TSP	Telecom Service Provider
94.	TW	Territorial Water
95.	UAE	United Arab Emirates
96.	UJ	Universal Joint
97.	UL	Unified License
98.	UL-ILD	Unified License- International Long Distance
99.	UNGA	United Nations General Assembly
100.	USA	United State of America
101.	USO	Universal Service Obligation
102.	USOF	Universal Service Obligation Fund