



10th February 2023

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Subject : Lightstorm response to TRAI's Consultation paper on Licensing Framework and Regulatory Mechanism for Submarine Cable Landing in India (Consultation Paper No.15/2022)

Dear Sir,

This is with reference to the TRAI consultation paper referenced above. We submit our response to the pertinent issue of Cable Landing Station and Submarine / Terrestrial cable for international connectivity.

We hope the above shall merit consideration of the Authority.

Thanking you,

Yours sincerely
For **Lightstorm Telecom Connectivity Private Limited**


for **Authorized Signatory**
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Enclosure: Our response

Lighstorm Telecom Connectivity Private Limited, response to TRAI's Consultation paper on Licensing Framework and Regulatory Mechanism for Submarine Cable Landing in India (Consultation Paper No.15/2022)

The consultation paper covers one of the most important elements of modern communication network, the 'submarine cable'. The communication systems across various geographies connect through a mesh of submarine cable (and terrestrial cables for some part) and it is noteworthy to state that 99% of international traffic flows through these cables making it the lifeline of connected world.

The United Nations, long back in 2010, had described submarine communications cables as "critical communications infrastructure" we propose that India should also declare cable landing stations and submarine cables and associated ecosystem as national critical infrastructure.

India should declare 'cable landing station' and 'submarine cable' and associated ecosystem as critical infrastructure of national importance.

A Cable Landing Station (CLS) is a terrestrial telecommunications facility that acts as a point of termination for one or more undersea fibre optic communication cables, these are also called as 'submarine cable' as it is laid on the ocean floor. It provides the interface between submarine cables and terrestrial communication networks.

The main function of the CLS is to provide a secure and stable termination point for the submarine cable, which enables the transfer of voice and data communication between various countries and continents. It also serves to protect the cable from accidental damage due to movement of shipping vessels in the vicinity, protects from damage caused by coast line erosion and ensure that the cable is not disrupted by environmental factors like earthquake and typhoons.

CLSs typically include equipment room, power supply systems, backup power generation facility to ensure communication is uninterrupted in the event of a power failure. They may also include optical amplification equipment/ submarine line terminal equipment (SLTE typically DWDM), power feed equipment (PFE), end balancer and other electronic equipment. The submarine cable which is laid on the sea floor makes a landfall at a secure location along the coast, and the underwater cable is connected using a land feeder cable from wet side to the dry side beach man-hole and further connected to the CLS. These distances can typically range between few kilometre upto 50 Km in certain locations.

Cable Landing Station (CLS) is the window to the interconnected world of telecommunications.

Another important aspect of the international telecommunications network is the 'terrestrial cable' which is an optic fibre cable connecting neighbouring countries through the land route. This should be included in the overall ambit of **International Connectivity** comprising of

- Cable landing point (submarine and terrestrial)
- Cable landing station (submarine and terrestrial)
- Submarine cable system for international and domestic connectivity
- Terrestrial cable system for international connectivity

Role of Cable Landing Station in Internet Resilience

A Cable Landing Station (CLS) plays an important role in ensuring internet resiliency, this refers to the ability of the internet to continue functioning even in the face of failures, disruptions due to man made activities or natural disasters and failure of components / power supply etc. The CLS is where the submarine communications cables come ashore and connect to the terrestrial communication network. In that sense it a point of failure.

We very well know that majority of our CLS are concentrated in Mumbai and Chennai, this makes us vulnerable to disruptions and brings down our internet resiliency in the infrastructure layer.

By having multiple cable landing stations in different locations, internet service providers can create redundancy in their networks, meaning that if one cable fails or is damaged, there are other paths for internet traffic to take to reach its destination. This helps ensure that the internet remains accessible and functioning even in the face of outages or disruptions.

Overall, the role of cable landing stations in internet resiliency is critical, as they provide a vital link in the global internet infrastructure and help to ensure the reliability and security of internet communication.

Lightstorm point wise response

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.

Our response

- a.) The below para is mentioned in the consultation paper, however the detailed activities involved in laying of cable system is not clearly defined in our license, as it adds to the ambiguity, this should be clarified.

Refer para 1.11 As per the existing telecom licensing regime, the company laying submarine cables in Indian Territorial Waters must hold a valid ILD license issued by Department of Telecommunications (DoT).

- b.) DoT has issued a 'Guideline and General Information for setting up of Submarine Cable Landing Stations for International Gateways for Internet'.

The similar guidelines for setting up of CLS under the ILD license is not available, this should be published with formats for application, list of clearances, information to be furnished and timelines for approval.

- c.) **Transit of international traffic:** The existing ILD license does not prohibit transit of international traffic, however due to lack of enabling provision the transit of international traffic is not taking off. For illustration the Mumbai Chennai transit facility through land based cable can bring down the latency by 12 msec. The detailed justification is provided below.

Strategic importance

India is located in a strategically and geographically significant position, where every cable system that connects Europe and South East Asia inevitably needs to transit. We recommend that enabling provisions should be made in the existing ILD license to encourage transit of international traffic through terrestrial cable.

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- ILD license should be amended to permit transit of international traffic through land route

- d.) **In-land cable landing station:** The provision for laying undersea cable and international cable landing station is under the ILD and Internet license only. There are no provisions for undersea cables and landing station under the NLD license. There is a case for laying of undersea cables connecting the domestic routes utilising the existing major/ minor port locations. Suitable provision may be added under the NLD license to enable this activity.

There is a case for linking coastal cities through domestic CLS with submarine cable running across the coast-line. This will provide route diversity for domestic circuits. This network can also be used to connect various CLS and provide the necessary diversity and improve our internet resilience. We recommend that enabling provisions should be made in the existing NLD license to encourage in-land CLS.

NLD licenses should be amended with enabling provisions to cater to the following scenarios.

- **In-land cable landing stations** along the coast line for the backhaul of domestic traffic through submarine cables
- **Transit of international traffic** from one CLS to another CLS through the land route
- **Connecting international CLS** to provide diversity and improve their resiliency.

e.) Indian Telecommunication Bill, 2022

There are few countries that have taken steps to ensure that this important element of communication system has the necessary protection under the law. For example Australia has a dedicated regime for protection of submarine cables, the Schedule 3A of Australia's "Telecommunications Act 1997 delves in great detail about the protection of submarine cable systems landing into Australia.

We recommend that these provisions may be studied by the Authority and as part of its recommendation suggest a dedicated section in our draft bill on 'submarine cable'.

A section should be added in the draft Indian Telecommunication Bill, 2022 to promote, incentivise and prioritize 'Cable Landing Station' and 'submarine cable'

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 the detailed justification.

Our response

We recommend that the following clause should be inserted in the ILD license

(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.

The detailed justification and recommended approach is provided below.

The cost of international bandwidth landing into India is prohibitive, much higher than the landing cost of bandwidth for similar distances and capacity to other foreign destination. The indicative landing cost of bandwidth is provided below for ready reference.

International Bandwidth (route)	Capacity	Monthly recurring charges (USD)
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Singapore - London	100 G	35 – 40,000
Singapore - Chennai	100 G	60 – 65,000
London/Paris – Mumbai	100 G	70 – 75,000
Singapore – USA West Coast	100 G	40 – 45,000
Japan – USA West Coast	100 G	35,000
London / Paris – USA East Coast	100 G	7 – 8,000

Scr: Tele geography

Access Facilitation Charges (AFC) / RIO

The TRAI recommendations of 2007/ 2012/ 2018 are being used as a shelter by incumbents for charging excessive interconnect fee. The existing concept of cable capacity delivery at “CLS” or “City PoP” must be removed w.r.t. dual pricing. The approach was right in early 2000s when the capacity termination in India was very small and the CLS operators Infrastructure cost was to be compensated. Today with the growth of traffic termination into India in last 5-7 years and the newer cable coming, the differential AFA / RIO pricing must be discontinued.

In fact the levy of AFC and co-location charge is acting as an entry barrier for setting of new CLS in India. Hence, we recommend that it should be done away with and any new CLS should be excluded from this regime.

One of the approaches adopted in other geographies is setting up of Carrier Neutral Data Centers with equal access to all eligible telecom licensees (ILD/ ISP).

Carrier Neutral Cable Landing Station

A carrier neutral cable landing station is a telecommunications infrastructure that provides interconnection between international submarine communications networks. The following are some of the key principles that govern the operation of a carrier neutral cable landing station.

1. **Neutrality:** The station should be neutral and impartial, providing equal access and treatment to all carriers, service providers and internet service providers.
2. **Open Access:** The station should provide open access to its facilities and services to all parties, without discrimination or preference.
3. **Interconnection:** The station should facilitate interconnection between different communication networks and submarine cable systems, enabling the exchange of traffic between them.
4. **Transparency:** The station should provide transparent information on its services, pricing and performance to its customers.
5. **Security:** The station should implement security measures to protect its facilities, services and information from unauthorized access, tampering or destruction.
6. **Reliability:** The station should provide reliable and high quality services to its customers, ensuring that its facilities and systems are available and functions at all times.
7. **Innovation:** The station should encourage and facilitate innovation in the telecommunications industry by providing flexible and scalable services and infrastructure.

By following these principles, a carrier neutral cable landing station can play a critical role in supporting the growth and development of global communications industry, enabling the exchange of information and content between different regions of the world.

Thus, all new CLS must have the provision for open access landing station by way of creation of meet me room (MMR) as one of the pre-condition and all ILDOs must be allowed to be co-located in the CLS with the diverse back haul fibres.

The Authority should recommend setting up of **Carrier Neutral Cable Landing Stations** in diversified locations to build **resiliency** in the telecommunications network

New Cable Landing Station proposals should promote **open access**

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.

Our response

Yes, the development of Indian entity owned cable laying vessel and cable repair vessel will definitely add to the technical capabilities of the nation. The government should provide up-skilling opportunities for technicians and also utilize the large base of ship building capabilities developed indigenously. In addition to the above, the foreign entity owned repair vessels may continue to be permitted for repair purposes.

The following processes may be optimized as part of EoDB for repair of cables.

- The spares and consumables used in the repair activity should exempt from customs levy / taxes upto 200 nm.
- Permission for Indian/ foreign repair vessels within 12nm within 24 hours on priority, for pre-approved repair and maintenance vessel, gears and crew.
- Single window clearance for permission for Indian/ foreign repair vessels within 200nm within few days on priority.

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.

Our response

The repair of submarine cable maybe facilitated through policy measure

- Pre-authorisation of personnel
- Free movement of vessels under pre-authorisation under intimation to GoI
- Facility for storage of spare cables and repeaters for more than 6 months, with exemption from levy of customs duty applicable for re-export

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.

Our response

The NLD license as such does not bar backhaul of domestic traffic through undersea route, however there are no specific enabling provisions.

Domestic Submarine Cables may be used for carrying domestic traffic, international traffic and international transit traffic, the details are explained below.

We recommend that the NLD license should be amended to enable the following:

- a) Setting up of **in-land cable landing stations** along the coast line for the backhaul of domestic traffic through submarine cables. This will provide the much needed route diversity at a much lesser cost and higher reliability as compared to the land route
- b) **Transit of international traffic** from one CLS to another CLS through the land route. Ideally every cable between Europe and South East Asia would need this transit facility though the terrestrial route. The present license condition permits NLD to backhaul traffic for ILD operator, so it is just an extension of the clause to include transit. For illustration :-
 - traffic coming from EU land at Mumbai and travels on terrestrial paths to Chennai and exits from Chennai CLS to Singapore
 - traffic of Nepal / Bangladesh wants to go to Singapore or EU, enters India through the terrestrial nodes and exits from Intl CLS to foreign destination
- c) **Connecting international CLS** to provide diversity and improve their resiliency. There are multiple pairs of fibre in a single fibre, separate optical path may be deployed for ILD, ILD transit and NLD traffic. This will make the Indian Submarine Cable network for Domestic traffic (figure 3.1) financially viable.

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?

Our response

This clearances and approvals for laying of **submarine cable**, setting up of CLS and repair/maintenance is time consuming. We recommend that DoT should be the nodal agency for seeking all approvals including environmental and coastal zone and security approvals. The process should be automated and tracked through the Gatishakti initiative of Government of India.

The process of obtaining clearances for laying **terrestrial cable** is not laid out, thus leading to inordinate delays and project over runs. We request Department of Telecommunications to issue a guideline document with clear formats, roles, responsibilities and timelines.

Sharing of domestic submarine cable should be permitted for carrying domestic traffic and international traffic with suitable optical isolation. This will make the project financially viable.

Viability gap funding – Domestic submarine cable

The submarine cable is a high CAPEX infrastructure, the cost of laying cable on the sea bed is much higher than laying land cable. The Authority should devise a mechanism for viability gap funding of the difference in cost through USOF for Domestic submarine cables. Similar arrangements have been made to fund submarine cables between Chennai – Andaman and Cochin – Lakshwadeep route.

Q7. 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.

Our response

Yes, this should be permitted.

Stub-cables are preinstalled shore-end cables more which could help in sharing of the fixed Mob / Demob costs for the specialist installation vessels and personnel. Pre-installed shore-ends would also enable safety and security of the cables in the corridor and reduce the permit time for subsequent cables on day2 interconnecting with the pre laid shore end stub.

Q.8 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.

Our response

The NLD license may be amended to include (refer our response to Q5 above)

Connecting international CLS to provide diversity and improve their resiliency. There are multiple pairs of fibre in a single fibre, separate optical path may be deployed for ILD, ILD transit and NLD traffic. This will make the Indian Submarine Cable network for Domestic traffic (figure 3.1) financially viable.

In addition to the above the CLS entity creates artificial bottle neck at the landing station, whereby the seeker of services is forced to take bandwidth from another location away from the landing site. This process circumvents the AFC regulation and the underlying changes prescribed by TRAI. This can be reviewed as the international bandwidth charges for India are much higher as compared to similar distances on other routes. (refer our response to Q2 above)

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.

Our response

We recommend the following for EoDB in the international communications business

No taxes on transit traffic and transit infra - In order to encourage India to become a global hub and a traffic transit country, there should be no Indian regulations, LIM requirements or taxes imposed on transit traffic even if the traffic is flowing on domestic cables partially but meant for foreign destination.

Taxes on sale of wholesale fiber pairs or capacity

A submarine cable owner should be allowed to sell capacity or fiber pairs to ILDO operators and taxes be charged upto 12 Nautical miles only (limits of Territorial waters).

LIM (Lawful Interception Monitoring) issues

LIM recommendations of 2007 notifications need to be updated with clear policy of amount of infrastructure required for the storage of identified traffic. With the newer designed cables capacities going upto 200Tbps per cable, a pragmatic LIM approach is required. With the advent of CMS, the whole onus of LIM by the ILDO should be revisited.

Single-window of clearance for submarine cable deals

Govt should create a single-window of clearance for all submarine cable permits and a requirement that such clearances will be given within 6 months of application. This can be achieved by Govt / DoT portal where cable owners can register and monitor the developments of each permit flow. A process similar to e-tender process should work well for such permitting approach with defined time limits for each step. This would enable strict respect to the timelines by agencies. This would make the whole process very time defined.

Safe corridors for cable landings in identified landing cities on East and West coast major cities

India should create multiple safe landing corridors to encourage more cables coming through at identified cities – examples could be west coast – Mundra/ Mandvi approaches, Manuva approaches, Mumbai to Alibag shoreline with defined corridors of upto 2-3 kms width, at East coast approaches to Chennai marina beach and landings on Chennai south ECR. Any specific cities that Gol decides should not land the cables should also be well defined so that alternate cities within such cities vicinity can be prioritized for landings.

Offshore India cable maintenance and storage zone is required

With the advent of newer cables in planned and likely to be installed over next 5 yrs – safe estimate is that around India subcontinental coast line there will be approx. 45000kms of submarine cables (AN islands to mid way between India – Oman/ UAE water). This calls for incentivizing the submarine cable maintenance authorities to setup dedicated cable repair, maintenance and storage facilities in east and west of India.

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