Quarterly Report on Monitoring of ICT Infrastructure

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Bhutan InfoComm and Media Authority

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Monitoring of ICT Infrastructure- FTTH Network and Communication cable layout in Samtse, Phuntsholing, Chukha, Haa and Paro

1. Background

As a part of monitoring of ICT Infrastructure, the team from Authority has carried out monitoring of FTTH network and communication cable layout in Samste, Phuntsholing, Chukha town and its peripheral areas.The division is carrying out monitoring of FTTH and communication cable layout as a part of monitoring of ICT Infrastructure in this financial year because the monitoring of Fiber network Infrastructure was completed in the last financial year. The monitoring of the FTTH network was to record the type of equipment or Infrastructure deployed for the FTTH network and type of services offered using the FTTH network. The monitoring of communication cable layout was carried out in Haa town and Paro town including its peripheral area in order to verify the measures taken by the relevant service providers based on the earlier monitoring. Monitoring of communication cable layout in above mentioned places is also to ascertain the implementation of rules and regulation related to communication cable layout and ADSS fiber cable layout.

2. Monitoring of FTTH Network and communication cable layout in Samtse Town

2.1 Monitoring of FTTH network of BTL in Samtse Town

Only BTL has the FTTH network implemented in Samtse town and TICL does not have their FTTH network in Samste. Therefore, the monitoring of the FTTH network of BTL is carried out with the team from BTL, Samste.

It was observed that BTL, Samste has implemented FTTH network using a single Tejas TJ400-1 FTTH equipment having 8 ports and each port has a capacity to distribute to 16 customers. All 8 ports of the equipment have been utilized for fiber network distribution using splitters stationed at convenient locations.

Figure 1 : Tejas TJ400-1 FTTH equipment installed at equipment room of Samste, BTL office

There is no underground duct system in Samtse town and all cable layout for telecom and cable services are done through aerial using the poles. The FTTH splitters located at different locations were monitored along with its cable layout and connection at the user ends as shown in the following pictures.

Figure 2: FTTH OLT splitters located in Samtse town site of BTL

Figure 3: FTTH OLT splitters located in Samtse town and proper cable crossover using the BTL poles with FTTH equipment at customer end.

Figure 4: FTTH OLT splitters located at Samtse hospital roof top for distribution of FTTH network(fixed line and Internet services) in Samtse hospital

Figure 5 : FTTH OLT splitters located at A.left- below Samtse District Court , B- right- near Samste border Gate for distribution of internet leased line services to immigration and custom check post.

2.2 Monitoring of communication cable layout in Samtse town and peripheral areas.

Only BTL and SKD cable have cable layout in Samtse town and TICL does not have cable layout in the whole of Samste since they use radio equipment for Internet Leased line distribution. Based on the monitoring of ICT infrastructure and cable layout of BTL and SKD cable in Samtse town and peripheral areas, the observations are as follows;

1. Improper cable road cross over of SKD cable- hanging on the other cables near Samtse FCB auction yard as shown in figure 9.

Figure 6: improper cable cross of SKD cable near Samtse FCB auction yard

2. Low hanging cables of SKD cables at Samtse FCB auction yard

Figure 7: low hanging cables of SKD cable near Samtse FCB auction yard and BOD ,Samste town

1. One good example of cable road cross over of BTL fiber cable, ADSS cable and SKD cable near FCB auction yard.

Figure 8: One good example of cable road cross over of BTL cable, government cable and SKD near FCB auction yard

2. Criss crossing cable layout of BTL and SKD cable in back of buildings in Samste Town

Figure 9: Criss crossing of cable layout of BTL and SKD cable in back of buildings in Samste Town

3. Monitoring of FTTH Network and Communication cable layout in Phuentsholing Town and its Peripheral areas

3.1 Monitoring of FTTH Network and Other ICT Infrastructure in Phuentsholing Town

The team monitored the FTTH fiber network cable layout of BTL in Phuentsholing town and also the DWDM equipment for the international bandwidth connections for both BTL and TICL as shown in the following figures. TICL does not have FTTH network implemented in Phuentsholing town and it was informed that TICL has FTTH network implemented in Chukha Chukha Hydro Energy Plant (CHEP) colony. The observation of the monitoring are as follows;

1. The DWDM equipment of TICL at Phuentsholing main site for International bandwidth connection with Airtel.

Figure 10: The DWDM equipment of TICL at Phuentsholing main site for International bandwidth connection with Airtel

2. The DWDM equipment of BTL at Phuentsholing main site for International bandwidth connection with Airtel.

Figure 11: The DWDM equipment of BTL at Phuentsholing Office site for international bandwidth connection with Airtel

3. Monitoring of FTTH cable layout of BTL in Phuentsholing town

The cable layout for FTTH network in Phuentsholing town is done through aerial with the use of poles. The splitters are stationed in favorable location for easy distribution to the customers as shown in figure given below:

Figure 12: FTTH splitter and cable layout of BTL in Phuentsholing town

3.2 Monitoring of DWDM for International bandwidth connection for both BTL and TICL at Pasakha

The team also monitored DWDM of BTL for international bandwidth connection with TATA at Pasakha BTS site having a capacity of 10 Gbps as shown in figure given below.

Figure 13: DWDM of BTL for international bandwidth connection with TATA at Pasakha BTS site

Similarly, TICL also has DWDM for international bandwidth connection with TATA at Pasakha BTS site having a capacity of 10 Gbps as shown in figure given below.

Figure 14: DWDM of TICL for international bandwidth connection with TATA at Pasakha BTS site

3.3 Monitoring of communication cable layout in Phuentsholing town

Only BTL, other ISPs and CaTV operators have a cable layout in Phuentsholing town and TICL does not have cable layout Phuentsholing since they use radio equipment for Internet Leased line distribution. Based on the monitoring of ICT infrastructure and cable layout of BTL , ISPs(Super net and Data net) CaTV operators(Tesla cable, CableSat, DrukCom) in Phuentsholing town and peripheral areas, the observations are as follows;

1. Low hanging stray cable(RJ-6) of cable operators near CableSat Office and cable layout without using the poles despite having poles available for sharing.

Figure 15: Low hanging stray cable(RJ-6) of cable operators near CableSat Office

2. Improper cable road crossover and improper cable layout of BTL , ISPs(Super net and Data net) and CaTV operators(Tesla Cable, CableSat, DrukCom) in Phuentsholing town

Figure 16: Improper cable road crossover and improper cable layout of BTL, ISPs and CaTV operators below Zangdopelri road crossover and Dekilam , Phuentsholing town

4. Monitoring of FTTH Network of TICL in Chukha Hydro Energy Plant(CHEP) colony

TICL does not have FTTH network implemented in Phuentsholing town and it was informed that TICL have implemented their FTTH network only in Chukha Hydro Energy Plant (CHEP) colony under Phuentsholing region office. Based on these, the team did TICL's FTTH monitoring in the CHEP colony. The findings are as follows;

1. A GPON OLT FTTH equipment is stationed at TICL Chukha CHEP BTS which is located just above the CHEP main substation.

   The GPON OLT has 8 ports and 7 ports have been utilized for distributing to around 80 customers of TICL in CHEP colony. 1 ports have capacity to provide to 16 customers and currently full capacity of each port has not been utilized.

Figure 17: A GPON OLT FTTH equipment is stationed at TICL Chukha CHEP BTS

2. FTTH GPON OLT Splitters stationed at different locations of CHEP colony.

Figure 18: GPON OLT Splitters stationed at different locations of CHEP colony

3. GPON OLT equipment at the customer end .

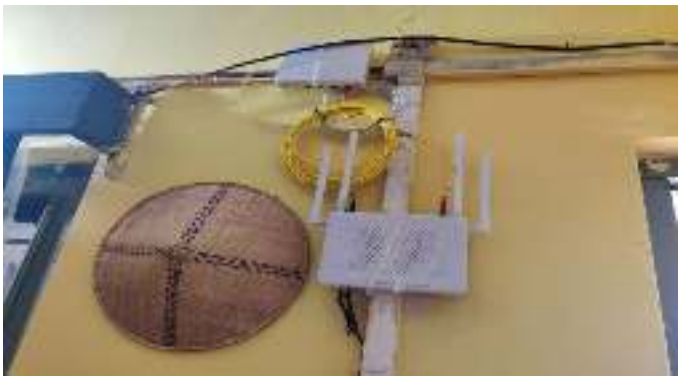

Figure 19 : GPON OLT Router and Switch at the customer end

5. Reverification of communication cable layout in Haa town and Peripheral areas

Only BTL and Leki cable have a cable layout in Haa town and TICL does not have cable layout in the whole of Haa since they use radio equipment for Internet Leased line distribution.
Based on the monitoring of ICT infrastructure and cable layout of BTL and Leki cable in Haa town and peripheral areas, the observations are as follows;

1. Improved cable road cross over by BTL in Haa Town.

Based on the earlier monitoring, BTL has made improvement in their cable layout at proper Haa town except for a few places. The BTL made improvements in cable road cross over in Haa town by increasing the height of poles espicially at road cross points.

Figure 20: Improved cable road cross over by BTL in Haa Town

2. Non usage of poles for cable road cross over by Leki cable and hanging cables at road cross over despite having the poles available for sharing for the common cable road cross over in Haa town , Katsho area near the bridge below Lhakhang Karpo.

Figure 21:Non usage of poles for cable road cross over by Leki cable and hanging cables at road cross over at Haa Town

Figure 22: Non usage of poles for cable road cross over by Leki cable and hanging cables at road cross over at left - near the bridge below Lhakhang Karpo and right- Katsho area.

3. One good example of proper cable layout by Leki cable at Haa Town.

Figure 23: One good example of proper cable layout by Leki cable at Haa Town

4. Multiple rooftop to rooftop cable road crossover by Leki cable at certain places of Haa Town.

Figure 24: Multiple rooftop to rooftop cable road crossover by Leki cable at certain places of Haa Town.

5. Non usage of poles for cable road cross over by Leki cable despite having the poles available for sharing for the common cable road cross over at Gjenkana area, Samar Gewog, Haa.

Figure 25 : Non usage of poles for common cable road cross over by Leki cable at Gjenkana area, Samar Gewog, Haa

6. Low cable road crossover of BTL at Gjenkana, Samar Gewog, Haa

Figure 26 : Low cable road crossover of BTL at Gjenkana, Samar Gewog, Haa

7. Low hanging cable of Leki cable at certain points on the road towards Damthang from Haa town.

Figure 27 : Low hanging cable of Leki cable at certain points on the road towards Damthang from Haa town

8. Low cable road crossover of BTL near Bji Gewog center, Haa

Figure 28: Low cable road crossover of BTL near Bji Gewog center, Haa.

6. Reverification of communication cable layout in Paro town and Peripheral areas

Only BTL, Sigma and TD cable service have a cable layout in Paro town and TICL does not have cable layout in the whole of Paro since they use radio equipment for Internet Leased line distribution. Based on the monitoring of ICT infrastructure and cable layout of BTL , Sigma and TD cable in Paro town and peripheral areas, the observations are as follows;

1. Low hagning cable of BTL with cables criss crossing each other at Paro town though BTL has very good cable layout and cable road crossing in most of the peripheral areas of Paro

Figure 29 : Low haning cable of BTL with cables criss crossing each other at Paro town

Figure 30: Low hanging cable at BTL's pole sharing site

2. Low hanging cable of TD cable with cables criss-crossing each other at Paro town and non usage of poles for common cable road crossover though there are poles available for sharing.

Picture 31: Low hanging cable of TD cable with cables criss-crossing each other at Paro town

Both Sigma and TD cables have multiple rooftop to rooftop road cross over though there are available poles for common cable road cross over.

Figure 32: Low rooftop cable crossover and non usage of poles for common cable road crossover by TD cable though there are poles available for sharing

3. Non usage of poles for common cable road crossover though there are poles available for sharing by Sigma cable at Paro town. Both Sigma and TD cables have multiple rooftop to rooftop road cross over though there are available poles for common cable road cross over.

Figure 33: Non usage of poles for common cable road crossover though there are poles available for sharing by Sigma cable at Paro town

4. Low hanging cables (at ground level near Zhiwa Ling hotel) near Satsam chorten, hanging cables near Kichu lhakhang of Sigma cable

Figure 34: Low hanging cables (at ground level near Zhiwa Ling hotel) near Satsam chorten, hanging cables near Kichu lhakhang of Sigma cable

5. Multiple rooftop to rooftop road cross over though there are available poles for common cable road cross over near Paro district court area for Both TD and Sigma cable.

Figure 35: multiple rooftop to rooftop road cross over though there are available poles for common cable road cross over near Paro district court area for Both TD and Sigma cable

6. Low hanging stray cable(RJ-6) of TD cable in roads towards Dhopshari Gewog center and Low hanging stray cable(RJ-6) of Sigma cable near BPC Office, Paro

Picture 36: Low hanging stray cable(RJ-6) of TD cable in roads towards Dhopshari Gewog center and Low hanging stray cable(RJ-6) of Sigma cable near BPC Office, Paro

1. Multiple rooftop to rooftop road cross over though there are available poles for common cable road cross over at Bondey town for Both TD and Sigma cable.

Figure 37 : Multiple rooftop to rooftop road cross over though there are available poles for common cable road cross over at Bondey town for Both TD and Sigma cable

2. One good example of common cable road cross over BTL, Sigma and TD cables near Bondey bridge.

Picture 38 : One good example of common cable road cross over BTL, Sigma and TD cables near Bondey bridge.

7. Actions taken based on the field visit

- Issued cautionary letter to relevant licensee to make necessary changes as per field report findings .

- Received the action taken report from BTL on the communication cable layout.

- Reviewed the action taken report from BTL and it was noted that BTL made necessary changes since they have submitted the report along with the pictures.

8. Recommendations/Way forward

- We may inform and coordinate with relevant licensee or stakeholders on the infrastructure sharing and cable layout carried out in above mentioned places.

- May inform service providers to improve their cable layout wherever required.

- May carry out similar exercises in other dzongkhags.