

National Fiber Network Reliability Report (July to September, 2020)



**Division of Telecom and Space
Department of IT and Telecom**

Executive Summary

In order to check and monitor the national network reliability, the DITT/MoIC has prepared the following report.

The data is collected from the stakeholders, Bhutan Power Corporation(BPC), Bhutan Telecom Limited (BTL), and Tashi InfoComm Limited (TICL) on a monthly basis and the report is prepared on a quarterly basis. This is the first quarter report for the financial year 2020-2021. The department shall publish 4 reports for the financial year 2020-2021.

Introduction

Department of Information Technology and Telecom (DITT) under MoIC (Ministry of Information and Communications) has implemented National Broadband Master Plan Implementation Project (NBMP) to establish a fiber optic backbone network throughout the country. Under the said project, 18 Dzongkhags have been connected with OPGW cables and remaining two Dzongkhags and 201 Gewogs have been connected with ADSS cables.

DITT is the sole owner of the National Fiber network. DITT leases the fibers to Telecom operators and Internet Service Providers for free of cost in order to ensure a level playing field for operators and to help improve competition at the service level. In addition, the fibers are also used by the department to establish connectivity to Community Centers.

BPC manages the Operation and Maintenance of the National Fiber Network. As of now, there are no fiber monitoring systems to conduct online detection and rectification of fiber outages. The fiber breakages are manually detected and rectified. According to the agreement signed between DITT and BPC on September 30th, 2011, BPC is mandated to maintain 98% point to point availability of fibers, except where disruptions are caused by force majeure conditions. Therefore, in order to check the consistency and availability of fibers, monthly fiber reliability reports are collected from the stakeholders (BTL, TICL, BPC). Data collected for the month of July to September, 2020 are reported below.

Objective of the study

To study the National Fiber Network Reliability in Bhutan

Methodology

A dashboard was prepared for maintaining the Fiber network reliability based on different parameters listed as follows:

- Fault Time (Time at which the fault occurred/detected)
- Fault Resolution (Time at which the fault was rectified)
- Outage Time (Duration of outage)
- Availability (Availability= ((Service Uptime/Total time)*100), Service Uptime=Total Time-Outage Time, Total Time=24*No. Of days in a month)
- Fault Type (Fiber breakages, Force Majeure, Equipment Faults, Schedule Maintenance)
- Customer Impact (No. of Dzongkhag affected, No. of sites affected)

This dashboard is shared with the relevant stakeholders (BTL, BPC and TICL) who use the Fiber network. The stakeholders were instructed and trained on the usage of the dashboard via email, letter and telephone after which they were asked to maintain records on above parameters on a monthly basis. This data collection is an ongoing process.

Key Findings

Based on the data submitted by the stakeholders the average availability for the months of July to September 2020 has been compiled in tables below.

1) Fiber Network Reliability report submitted by TICL

Months	Availability in percent	Fault Type	Outage Duration	Remarks
July	100	NA	NA	NA
August	100	NA	NA	NA
September	8.54	Fiber break	658.512	Fiber break between Tsenkari SS and

				Chokorling BTS
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Average availability for July and August was 100%

Availability for September was 8% for Tsenkari to Choekhorling BTS for september but 100% for all other routes

2) Fiber Network Reliability report submitted by BTL

Months	Availability in percent	Fault Type	Outage Duration (hr:min:sec)	Remarks
July	98.50	Fiber break by squirrels	11:15:00	-Dagapela to Tsendagang
	99.69	Fiber break by squirrels	2:25:00	-Dagapela to Tsendagang
August	94.16	Fiber break by squirrels	43:44:00	-Pling to Denchukha
	97.96	Fiber break	15:12:00	-Lhuntse to Dungkar
	98.47	Fiber break	11:34:00	-Khaling to Wamrong
September	99.51	Fiber break	3:49:00	Pling to Denchukha
	99.65	Fiber break	2:47:00	Kanglung to Tshenkarla

Average availability was 98.513%.

3) Fiber Network Reliability report submitted by BPC

Months	Availability in percent	Fault Type	Outage Duration	Remarks
July	100	NA	NA	Resplicing work on 3 July between samtse to Gomtu SS.Outage For 5 hrs

August	100	NA	NA	Cable replacement works between Kanglung to Doksum SS. Outage incurred for 4 hrs on 9th August
September	100	NA	NA	NA

Average availability was 100%

Conclusion

The above analysis was limited to the monthly network reliability reports submitted by the Telcos/ISPs and BPC. From the reports collected for July to September 2020, BTL average was 98.513%. For TICL the availability for July and August was 100% whereas for September, it was only 8.53% due to fiber break at Tsenkhari SS and Chokhorling BTS stretch affecting the 3G services in that locality. However the issue was resolved on 23 September 2020.

From the report submitted by BPC the availability for the month of July to September was 100%. BPC was able to maintain the availability above 98%.

With Fiber Monitoring System (FMS) in place, the FMS has made works of BPC officials more efficient and easier without BPC officials having to manually visit fault areas. With use of FMS, not only fiber faults can be directly detected but also pin-point the location of the breakages. This will allow the rectification team to proceed and resolve the issue with minimal waste of resources and time. However even FMS in place, the ISPs need to prepare and submit the Monthly Network Availability Reports to DITT since the FMS is not able to monitor fiber owned by ISPs.

Constraints

1. There was a delay in the report submitted by ISPs and BPC for the month of July to September 2020. This creates delay while publishing the quarterly report for DITT.
2. It was observed that the fiber breakage for Bhutan Telecom was caused by Squirrels for Pling to Denchukha stretch and Dagapela to Tshendagang stretch for the month of July and August 2020 as per reports submitted by Bhutan Telecom

3. It was observed that the fiber outages recorded by ISPs/TSPs were missing in the records maintained by BPC. This could be due to the fibers leased to the respective stakeholders or issues with record maintenance.
4. It was observed that it was difficult for the DITT official to seek clarifications and doubts related to fiber reports submitted by Tashi cell and BPC focal persons. Also the reports submitted by Tashicell had minor miscalculations errors. The department had requested Tashicell focal to clarify and resubmit the report.
5. Since TICL has reflected in their report that the availability for the month of September for Tsenkari SS to Chorkorling BTS was 8.54%. The Department clarified with TICL and BPC and was informed that the issue was resolved and the fiber break was caused by the elephant.