

National Fiber Network Reliability Report (First Quarter, July to September, 2021)



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

Table of Contents

Executive Summary	2
Background	2
Objective and Methodology used	3
Key Findings and reports collected from stakeholders	4
Fiber Network Reliability report submitted by TICL	4
Fiber Network Reliability report submitted by BTL	4
Fiber Network Reliability report submitted by BPC	6
Constraints	7

Executive Summary

In order to check and monitor the national fiber 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 2021-2022.

Background

The Department of Information Technology and Telecom (DITT) under MoIC (Ministry of Information and Communications) has implemented the 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. 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, 2021 are reported as below.

Objective and Methodology used

Objective: To study the National Fiber Network Reliability in Bhutan

Methodology Used: 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 ($\text{Availability} = ((\text{Service Uptime} / \text{Total time}) * 100)$, $\text{Service Uptime} = \text{Total Time} - \text{Outage Time}$, $\text{Total Time} = 24 * \text{No. Of days in a month}$)
- 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 and reports collected from stakeholders

Based on the data submitted by the stakeholders the average availability for the months of July to September 2021 has been compiled in tables as below.

Fiber Network Reliability report submitted by TICL

Months	Availability in percent	Fault Type	Outage Duration	Remarks
July	100	NA	NA	NA
August	99.93	Schedule maintenance	00:30:06	OPGW maintenance Between Lobesa and Rurichu on 29/8/2021
September	100	NA	NA	NA

Average availability was 99.976%

Fiber Network Reliability report submitted by BTL

Months	Availability in Percent	Fault type	Outage Duration (hr:min:sec)	Remarks
July	99.53	Fiber break	3:47:00	Samdrupcholing to Jomotshangkha on 4/7/2021
	61.29	Fiber break	288:00:00	Pling to Denchukha on 7/7/2021 to 19/7/2021
	63.03	Fiber break	275:02:00	Gedu to Lhamoizingkha on 9/7/2021 to 20/7/2021

	98.38	Fiber break	12:07:00	Baychu to Lhamoizingkha on 15/7/2021 to 16/7/2021
	99.85	Fiber break	1:07:00	Gelephu to Jigmeling on 24/4/2021
	99.70	Fiber break	02:23:00	Tshenkhalā to Trashiyangtse on 29/7/2021
	NA	Fiber break	16 days plus	Samdrup Jongkhar to samdrup choling on 31/7/2021 to 16/8/2021
August	99.70	Schedule maintenance	2:22:00	Tshenkhalā to Trashiyangtse on 1/8/2021
	99.85	Schedule Maintenance	1:05:00	Kanglung to Tshenkhalā on 1/8/2021
	99.65	Schedule Maintenance	2:55:00	Tshenkhalā to Trashiyangtse on 2/8/2021
	99.24	Fiber Break	5:59:00	Tshenkhalā to Trashiyangtse on 3/8/2021
	99.83	Fiber break	1:25:00	Lobesa to Damji on 10/8/2021
	92.04	Fiber break	59:16:00	Pling to Denchukha 19/8 /2021 to 21/8/2021
	99.88	Fiber break	8:33:00	Gyalposhing to Limingthang on 27th to 28th Aug, 2021
	99.86	Fiber break	1:00:00	Deothang to samdrupcholing on 30/8/2021
	92.98	Fiber break	52:16:00	Deothang to samdrupjongkhar on 30/8/2021 to 1/9/2021
September	99.54	Schedule maintenance	3:13:00	Khaling to Wamrong on 1/9/2021
	99.86	Schedule maintenance	1:00:00	Tsirang-tingtibi-Yurmoo to Gelephu on 1/9/2021
	99.70	Schedule Maintenance	2:16:00	Sipsoo to Tendruk on 2/9/2021
	99.96	Fiber break	00:28:00	Dagapela to Tshendegang GC on 9/9/2021

	99.78	Fiber break	1:52:00	Nganglam xge to Tshenkari on 12/9/2021
	99.23	Fiber break	5:54:00	Samdrupjongkhar to Martanga on 12/9/2021
	99.83	Fiber break	1:17:00	Damthang to Yamthang on 12/9/2021
	99.92	Fiber break	00:57:00	Wangdue to Pelela On 30/9/2021

Average availability was 95.766%

Fiber Network Reliability report submitted by BPC

Months	Availability in percent	Fault Type	Outage Duration	Remarks
July	100	NA	NA	NA
August	100	Fiber replacement	NA	Lobesa to Rurichu on 28/8/2021
	100	Fiber replacement	NA	Lobesa to Rurichu on 29/8/2021
September	100	Fiber realignment work	NA	Gelephu tingtibi realignment work on 30/8/2021
	100	Fiber bend	NA	Tingtibi- pangbang-ngalam work on 1/9/2021

Average availability was 100%

Conclusions

The above analysis was limited to the monthly network reliability reports submitted by the two Telcos and BPC. From the reports collected for July to September 2021, TICTL average was 99.976 % and 95.766% for BTL. The average availability was 97.871% for two Telcos for July to September 2021.

From the report submitted by BPC the availability for the month of July to September 2021 was 100%. BPC was able to maintain the availability above 98%.

Constraints

1. There was a delay in the report submitted by ISPs and BPC since the focals were engaged in some other important activities. This has created delay while publishing the first quarterly report for DITT.
2. 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.
3. Even after repeated reminders from DITT regarding the report submission there still is delay from the stakeholders.
4. The focal from the Telcos are submitting incomplete reports which when compiled by DITT creates further delay while seeking clarifications.