

National Fiber Network Reliability Report (Second Quarter, October to December, 2021)



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

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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 second 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 October to December, 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 October to December 2021 has been compiled in tables as below.

Fiber Network Reliability report submitted by TICL

Months	Availability in percent	Fault Type	Outage Duration	Remarks
October	100	NA	NA	NA
November	100	NA	NA	NA
December	100	NA	NA	NA

Average availability was 100%

Fiber Network Reliability report submitted by BTL

Months	Availability in Percent	Fault type	Outage Duration (hr:min:sec)	Remarks
October	100	NA	NA	NA
November	99.55	Patch cord faults	3:18:00	Tangmachu to Lhuntse on 27/11/2021
December	98.44	Fiber break	8:59:00	Rurichu to Baychu on 2/12/2021

	99.86	Schedule maintenance	1:00:00	Rurichu to Baychu on 3/12/2021
	97.94	Fiber break	09:45:00	Gelephu to Gelephu substation on 11/12/2021
	99.25	Fiber break	18:15:00	Paro to Drugyal On 31/12/2021

Average availability was 99.008%

Fiber Network Reliability report submitted by BPC

Months	Availability in percent	Fault Type	Outage Duration	Remarks
October	100	NA	NA	NA
November	100	Realignment works	3:00:00	Realignment works from Lobesa substation to Lingmukha Gewog, Shengana, Bjemi Gewog, , Dzomi Gewog, Chhubu Gewog, Toedwang Gewog Rurichu on 19/11/2021
December	100	Shifting Works	3:00:00	Chubachu substation to Dechencholing on 20/12/2021

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 October to December 2021, TICL average was 100 % and 99.008% for BTL. The average availability was 99.504% for two Telcos for October to December 2021.

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

Constraints

1. There was still 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 Second quarterly report for DITT. 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.
2. Even after repeated reminders from DITT regarding the report submission there still is delay from the stakeholders. However the focal has expedited sharing the reports compared to past practices.