

National Fiber Network Reliability Report **(April to June, 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 fourth quarter report for the financial year 2020-2021. The department has published 3 reports till date for the financial year 2020-2021.

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 April to June, 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 ($\text{Availability} = \frac{\text{Service Uptime}}{\text{Total time}} * 100$), $\text{Service Uptime} = \text{Total Time} - \text{Outage Time}$, $\text{Total Time} = 24 * \text{No. Of days in a month}$)
- 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 April to June 2021 has been compiled in tables as below.

Fiber Network Reliability report submitted by TICL

Months	Availability in percent	Fault Type	Outage Duration	Remarks
April	99.99	NA	NA	NA
May	96.168	Fiber break	0:15:79	Tongtibi ss to nganglam on 9/5/2021
		Fiber break	18:40:41	Motithang ss to Jungshina ss on 9/5/2021
		Fiber break	6:33:06	Khangma ss to Merak on 21/5/2021
June	99.18	Fiber break	9:10:00	Fiber break between KHPC and Nangkhor stretch on 9/6/2021

Average availability was 98.446%

Fiber Network Reliability report submitted by BTL

Months	Availability in Percent	Fault type	Outage Duration (hr:min:sec)	Remarks
April	99.28	Fiber break	5:16:00	Wangdue to pelela on 3/4/2021
	99.92	Fiber break	00:51:00	Korila to Yadi on 6/4/2021

	99.65	Fiber break	2:47:00	Gelephu to Jigmeling on 9/4/2021
	99.92	Schedule maintenance	0:57:00	S/Jongkhar to Dewathang on 17/4/2021
	99.85	Fiber break	1:07:00	Gelephu to Jigmeling on 24/4/2021
May	99.67	Fiber break	2:39:00	Zhemgang to Gompong on 2/5/2021
	32.43	Fiber break	502.69:00	Baychu to Lhamoizingkha on 26/5/2021
	99.15	Fiber break	6:29:00	Dagepela on 12/5/2021
	99.83	Schedule maintenance	1:20:00	Maintenance between Kanglung to Ranjung on 12/5/2021
	97.31	Fiber break	20:00:00	Gedu to Lhamoizingkha on 20/5/2021
	99.15	Fiber break	13:40:00	Kanglung to Lhamoizingkha on 22/5/2021
	98.33	Fiber break	16:54:00	Lhuntse to Dungkhar on 28/5/2021
	90.44	Fiber break	10:29:00	Pling to Denchukha on 29/5/2021
	99.02	Fiber break	21:43:00	Gangtey to Pelela on 30/5/2021
June	97.62	Schedule maintenance	17:10:00	OPGW mtc at KHPC, Gyelposhing on 5/6/2021
	95.89	Fiber break	29:57:00	Lhamoizingkha to Baychu on 7/6/2021
	99.94	Fiber break	0:39:00	Dagepela xge to Tsirang on 7/6/2021
	99.50	Fiber break	3:53:00	Gyelephu to Jigmiling on 16/6/2021
	95.93	Fiber break	29:30:00	Lhuntse to Dungkhar on 16/6/2021
	97.31	Fiber break	19:36:00	Dewathang to Samdrupcholing on 17/6/2021

	99.64	Fiber break	2:52:00	Simtpkha to Dochula on 28/6/2021
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Average availability was 95.227%

Fiber Network Reliability report submitted by BPC

Months	Availability in percent	Fault Type	Outage Duration	Remarks
April	100	NA	NA	NA
May	100	NA	NA	Resplicing work at substation Gantry on 22/2/2021
June	98.69	OPGW realignment	17:20:00	KHPC and Nangkhor ss on 5/6/2021

Average availability was 99.563%

Conclusions

The above analysis was limited to the monthly network reliability reports submitted by the two Telcos/ISPs and BPC. From the reports collected for April to June 2021, TICL average was 98.446 % and 95.227% for BTL. The average availability was 96.8365% for two Telcos for April to June 2021.

From the report submitted by BPC the availability for the month of April to June 2021 was 99.563%. 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 fourth 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. DITT has requested focals from stakeholder to share the monthly fiber report for the previous month during the first week of the current month so that the Department doesn't have to follow up every time with the focals of the stakeholder for the same, Even then, the focals fail to submit the reports on time.