

Eastern Regional Power Committee

Minutes of Special PRM Meeting held on 14th February, 2017 at ERPC, Kolkata

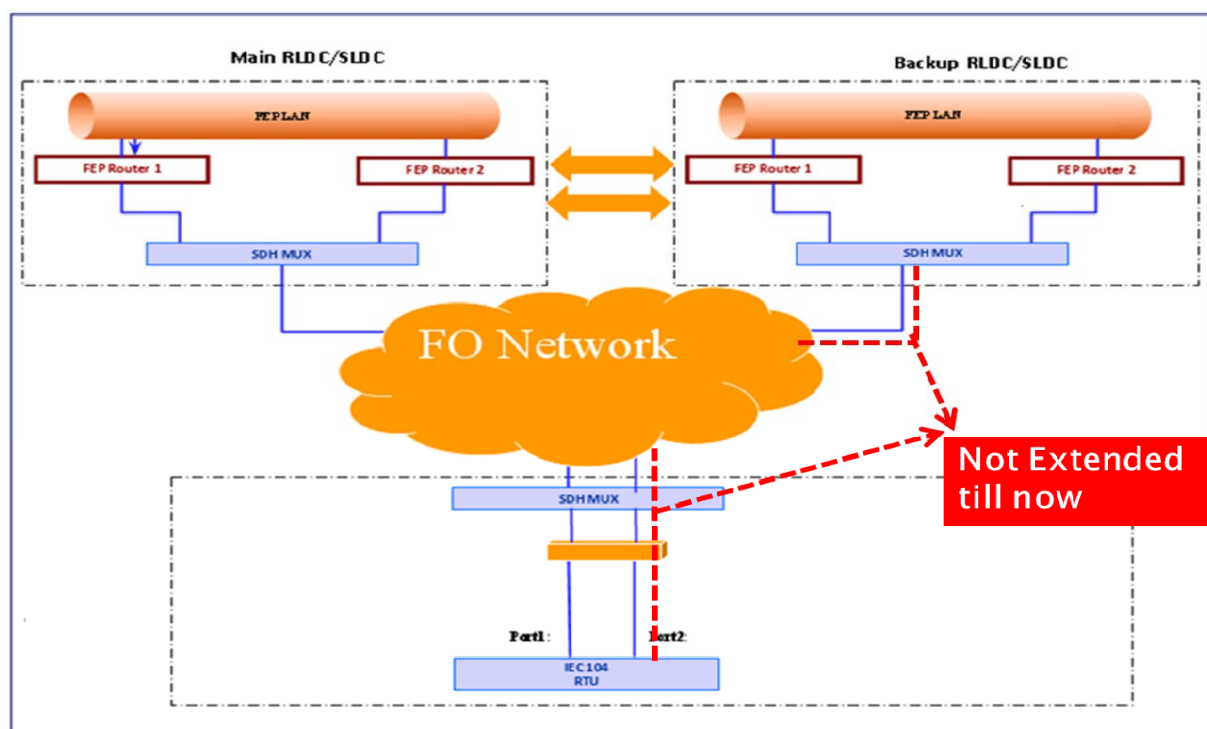
List of participants is at **Annexure-I**.

Shri A. K. Bandyopadhyaya, Member Secretary, ERPC, at the outset, welcomed all the participants from POWERGRID, ERLDC and constituents in the meeting. He informed that this special meeting was convened as per the decision of 34th TCC for ensuring the data redundancy in case of failure of ICCP link/other communication equipment at either of the control centre. He further requested ERLDC to take the agenda.

ERLDC informed that there are two major issues which need to be deliberated and addressed. The issues are as given below:

(i) RTU / SAS reporting to back-up control centres:

ERLDC informed that since backup of ERLDC control centre is operational at NLDC, New Delhi, Katwaria Sarai so data reporting of each RTU / SAS has to be available to both the control centres i.e. main as well as back up control centre. Schematic data flow chart is shown below:



POWERGRID LD&C informed that provision of data reporting of each RTU / SAS to both the control centers are already under implementation.

POWERGRID further informed that central sector RTU/SAS (10 Nos) are reporting at Durgapur which are currently reporting to main ERLDC control center. Same can also be reported at backup ERLDC control center through Ethernet link (TS would be placed at Durgapur PG). POWERGRID further informed that provision of data reporting of RTUs / SAS at main ERLDC control center through LOOP PDH can be extended directly from RTUs / SAS to backup ERLDC control center by putting separate LOOP PDH (making separate channel plan) at backup ERLDC control center. POWERGRID further informed that provision of data

reporting of RTUs / SAS at main ERLDC control center through Alcatel PDH could not be extended to backup ERLDC control center as this equipment is quite old and the same can't be placed at backup ERLDC control center for dual reporting at backup ERLDC control centre.

ERLDC informed that it would be difficult to maintain the TS being placed at Durgapur as Durgapur site is not covered under the scope of new SCADA AMC. ERLDC further informed that alternate channel for each RTU / SAS reporting at Durgapur must be provided by POWERGRID. ERLDC raised concern about old equipment of Alcatel PDH and requested POWERGRID to plan an alternate solution at the earliest.

POWERGRID informed that independent reporting of RTU/SAS to backup ERLDC control center may consume lots of bandwidth and independent reporting will be easier through VLAN in 104 protocols but the old RTU in Central sector is not having 104 protocols provision. POWERGRID further informed that provision of dual reporting of RTUs / SAS would be possible in 104 protocols only after replacement of old RTUs.

ERLDC informed that new SCADA system is designed for dual reporting considering VLAN in 104 protocols and unless until, the dual data reporting of each RTUs / SAS would be configured in 104 protocols, complete control centre backup will not be achieved. So, it is quite necessary to replace the old RTUs / SAS at the earliest.

GM, ERLDC informed that process of replacement of similar old RTUs has taken up at Western Region also after getting proper approval at RPC level. GM, ERLDC suggested that a committee may be constituted to begin with to assess the requirement of the replacement of the old RTUs.

After detailed discussion, all members agreed and referred to TCC for further guidance.

(ii) Redundancy of ICCP links between control centres:

ERLDC informed that there was a total failure of ICCP links on 08th August 2016 at 05:53 Hrs which was restored on 11th August 2016 at 03:19 Hrs. ERLDC further informed there are several other instances where ICCP links fail, few of them are listed below:

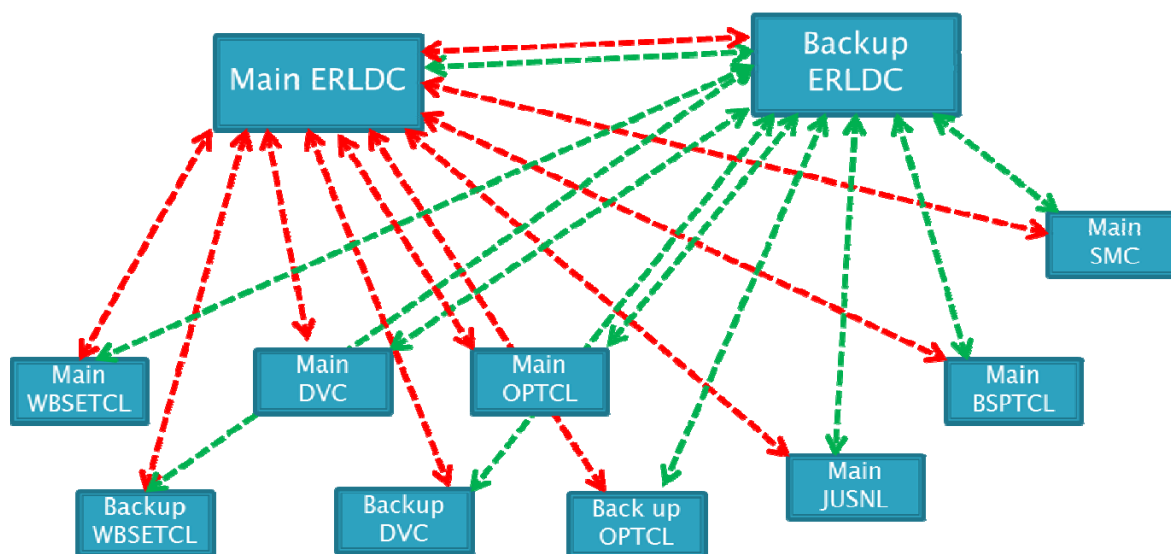
- ✓ On 30th Dec 2016 at 04:36 Hrs, restored at 11:30 Hrs (except WB) – **06 Hrs 54 min**
- ✓ On 31st May 2016 at 11:40 Hrs, restored at 16:07 Hrs (All) – **04 Hrs 27 min**
- ✓ On 12th May 2016 at 22:00 Hrs, restored at 15:15 Hrs on 17th May 2016 (JUSNL) – **4 days 04 Hrs 27 min**
- ✓ On 26th June 2016 at 21:08 Hrs, restored at 14:10 Hrs on 27th May 2016(OPTCL) – **17 Hrs 2 min**

ERLDC further informed that the matter has been discussed in various OCC & 34thTCC/ERPC meetings wherein it was advised to call a special SCADA meeting to discuss the said issue.

POWERGRID informed that ICCP links failure on 08th August 2016 was due to the additional ports configured in the networks on ad hoc request of constituents for IT and ERP like services, which modifies the channel plan from the original design in an unplanned manner. The same was pointed out in the Report as submitted in the 125th OCC meeting held on 20th September 2016. POWERGRID further informed that it would be advisable that such requests should go through proper approval of LD&C (POWERGRID) for assessment of impact on the critical GRID operations traffic prior to configuration.

*After detailed discussion, it was decided that a tentative list of IT security policy has to be prepared so that the same issue could be addressed properly. Further, ERLDC was requested to formalize a tentative list of IT security policy for SCADA system in Eastern Region. ERLDC agreed and prepared the list which is enclosed at **Annexure – II**.*

Further, ERLDC informed that ICCP links from ERLDC / backup ERLDC to all control centres should be available as mentioned in the diagram below:



POWERGRID intimated that the ICCP connectivity of Backup ERLDC with all the control centers will be fully implemented after complete route redundancy of optical fiber. There are few paths (especially last mile) where there is no fiber redundancy. POWERGRID requested constituents to explore and implement the last mile redundant fiber connectivity. Such path having no redundancy has been identified for each sector and redundant route is shown in ICCP flow diagram in **Annexure – III**. Following are the sections where fiber laying is to be done/under implementation:

Central Sector:

ERLDC to Kasba – POWERGRID informed that one UGFO link between ERLDC to Kasba is under implementation by them. POWERGRID further informed that alternate FO link connectivity may be implemented after getting the fiber connectivity from CESC (Kasba S/S – Jadavpur S/S – ERLDC) for route diversity for redundancy. POWERGRID requested ERLDC to take up the matter with CESC so that the same fiber can be used between ERLDC to Kasba for route diversity for redundancy.

Farakka to Jeerat – POWERGRID informed that presently, FO link connectivity is available between Farakka to Jeerat through Behrampur which doesn't have route diversity. POWERGRID further informed that route diversity for redundancy would be available after commissioning of OPGW link from Farakka to Jeerat through Gokarna, Rajarhat & Subhashgram.

WBSETCL Sector:

Kasba to Arambag – POWERGRID informed that presently, FO link connectivity is available between Kasba to Arambag through Jeerat, Behrampur, Farakka & Durgapur which doesn't have route diversity. POWERGRID further informed that route diversity for redundancy would be available after commissioning of OPGW link from Kasba to Arambag through Jeerat & Krishnanagar as mentioned in the ICCP flow diagram of WBSETCL. POWERGRID further informed that the same would be implemented by December 2017.

DVC Sector:

Howrah SLDC to ERLDC– POWERGRID informed that presently, FO link connectivity between Howrah SLDC to ERLDC is available through leased line. POWERGRID further informed that route diversity for redundancy would be available after commissioning of OPGW link from Howrah SLDC to Maithon SLDC & Howrah SLDC to Waria as mentioned in the ICCP flow diagram of DVC. POWERGRID further informed that the same would be implemented by June 2017.

Kalyaneshwari to Mathon SLDC – POWERGRID informed that presently, FO link connectivity is available between Kalyaneshwari to Maithon SLDC through Maithon HPS which doesn't have route diversity. POWERGRID further informed that route diversity for redundancy would be available after commissioning of OPGW link from Maithon SLDC to Howrah SLDC as mentioned in the ICCP flow diagram of DVC. POWERGRID further informed that the same would be implemented by June 2017.

OPTCL Sector:

Rourkela to Bhubaneswar SLDC – POWERGRID informed that presently, FO link connectivity between Rourkela to Bhubaneswar SLDC is available through TSTPS, Meeramundali & Mendhasal which doesn't have route diversity.

OPTCL informed that route diversity for redundancy would be available after commissioning of repeater station at Bhabanipatna between Jeypore – Bolangir line and FO link connectivity from Meeramundali to Bhubaneswar SLDC through Duburi New, Jagatsingpur & Cuttack as mentioned in the ICCP flow diagram of OPTCL. OPTCL further informed that the same would be implemented by March 2018.

BSPTCL Sector:

Biharsharif 400 kV (PG) to Patna SLDC –POWERGRID informed that presently, FO link connectivity between Biharsharif 400 kV (PG) to Patna SLDC is available through Biharsharif 220 kV, Fatwa & Jakkanpur which doesn't have route diversity.

BSPTCL informed that FO link connectivity between Biharsharif 220 to Jakkanpur would be available through Bodhgaya, Chandwa, Jahanabad & Sipara. The same would be implemented by July 2017.

POWERGRID informed that route diversity for redundancy between Biharsharif 400 kV (PG) to Jakkanpur could not be achieved until unless FO connectivity from Patna to Sipara or/and Biharsharif 400 kV (PG) to Biharsharif 220 kV would be implemented. POWERGRID requested BSPTCL to get this FO link implemented.

BSPTCL requested POWERGRID to include the same in the existing FO link implementation contract.

POWERGRID requested BSPTCL to explore the possibility of FO connectivity from Jakkanpur to Patna SLDC from their DISCOM for route diversity and redundancy between Jakkanpur to Patna SLDC. BSPTCL agreed for the same.

JUSNL Sector:

Ranchi 400 kV (PG) to JUSNL SLDC (Kushai Colony) –POWERGRID informed that presently, FO link connectivity between Ranchi 400 kV (PG) to JUSNL SLDC is available through Hatia 220 kV which doesn't have route diversity.

POWERGRID further informed that route diversity for redundancy between Ranchi 400 kV (PG) to JUSNL SLDC (Kushai Colony) could not be achieved until unless OPGW connectivity from Chandil to JUSNL SLDC through Namkum (132 kV) i.e. 95 Km could be completed. POWERGRID further informed redundant fiber route is to be explored and implemented by JUSNL.

Sikkim:

Gangtok to Sikkim SLDC –POWERGRID informed that presently, FO link connectivity between Gangtok to Sikkim SLDC is available which doesn't have route diversity.

POWERGRID further informed redundant fiber route is to be explored and implemented by Sikkim.

Additional Agenda: Revision of DPR for establishment of Reliable Communication (Bihar-Portion) — by BSPTCL

BSPTCL vide letter dated 07.01.17 intimated that the that power sector in Bihar is growing many folds. Since the submission of transmission details and its connectivity diagram to PGCIL, many new transmission lines and sub-station has been commissioned and many of these elements are going to be commissioned shortly. Further, in view of achieving redundancy, some transmission lines have been taken into consideration for laying OPGW under ULDC revised scheme. This scheme is under implementation with PGCIL. So, the DPR need to be revised based on the update information of Sub-stations which is enclosed at **Annexure- IV**.

Powergrid informed that the State portion has to be implemented by the respective States. Powergrid will only implement for the Central Sector portion.

The meeting ended with thanks to the chair.

Participants in Special PRM for ensuring data redundancy in case of failure of any one communication system at either of the control centre

Venue: ERPC Conference Hall, Kolkata

Time: 11:30 hrs

Date: 14.02.2017 (Tuesday)

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20	A.K. Samantaram	CGM (Telecom)	9438907720	egm.tel@optel.co.in	A.K. Samantaram

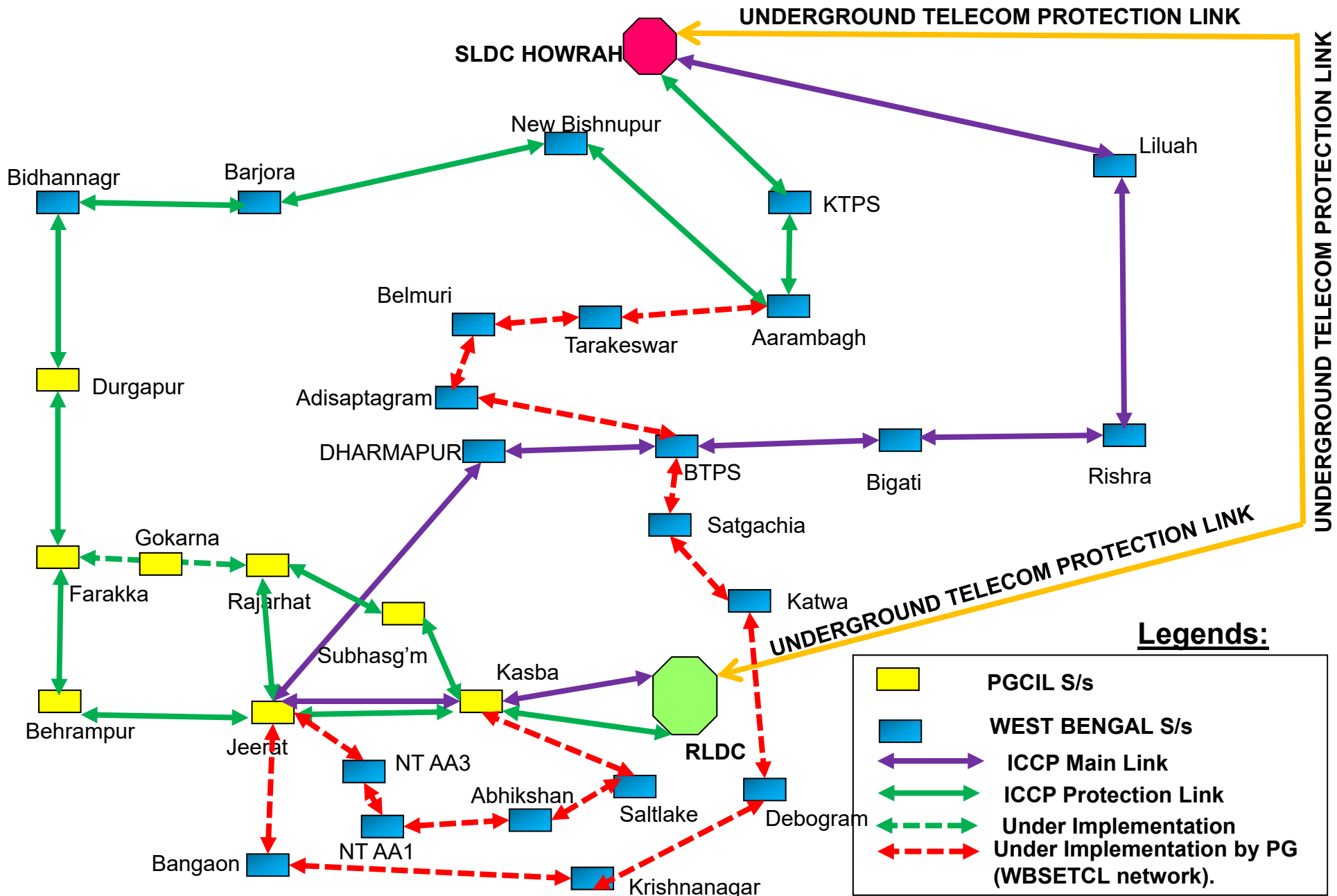
IT Security Policies to be implemented in SCADA System

1. Disable all the USB/Mass storage access to all the SCADA hardware assets and if any file / folder is required to be copied, the same may be done through CD drive.
2. Do not allow any 3rd Party employee or visitor to connect his/her Laptop into SCADA system Network.
3. Restrict the entry of the employees to Data Server Rooms and control Rooms as per their roles.
4. Do not share your passwords to anybody; also do not write your passwords for remembrance.
5. Strong Password and Password change policy should be maintained.
6. Regular update of security patches in Operating Systems, Database, Antivirus and IPS System Installed.
7. Approval should be taken from Competitive Authority or POWERGRID before integrating SCADA System to any other system.
8. Only the required data should be allowed to transfer between two Systems through Firewalls.
9. Internet access should be restricted to the specific and secure sites only through Web Servers.
10. Policy should be configured in Workstations or Servers for not installing internet dongles applications and personal internet should not be allowed like using Mobile Access Points through Wifi.
11. Update the SCADA application to the latest versions.
12. Try to minimize the use of 3rd Party software. If required regularly update the versions.
13. Open source software should not be allowed to use in any SCADA hardware.
14. Cyber security audit should be planned every year by security certified organization & mitigation must be implemented as suggested by the agency.

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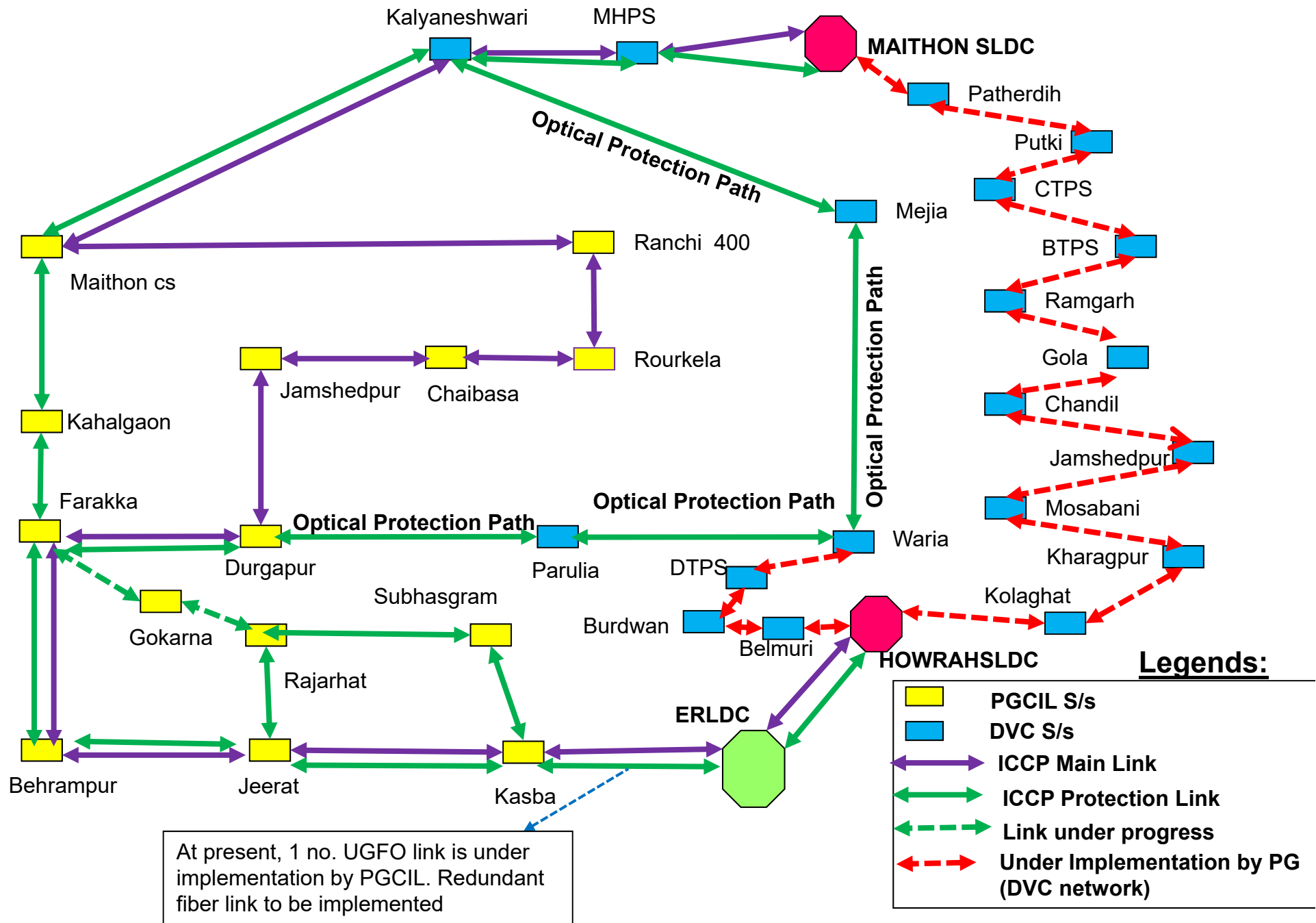
ICCP FLOW OF WEST BENGAL

Annexure - III



ICCP FLOW OF DVC

Annexure - III

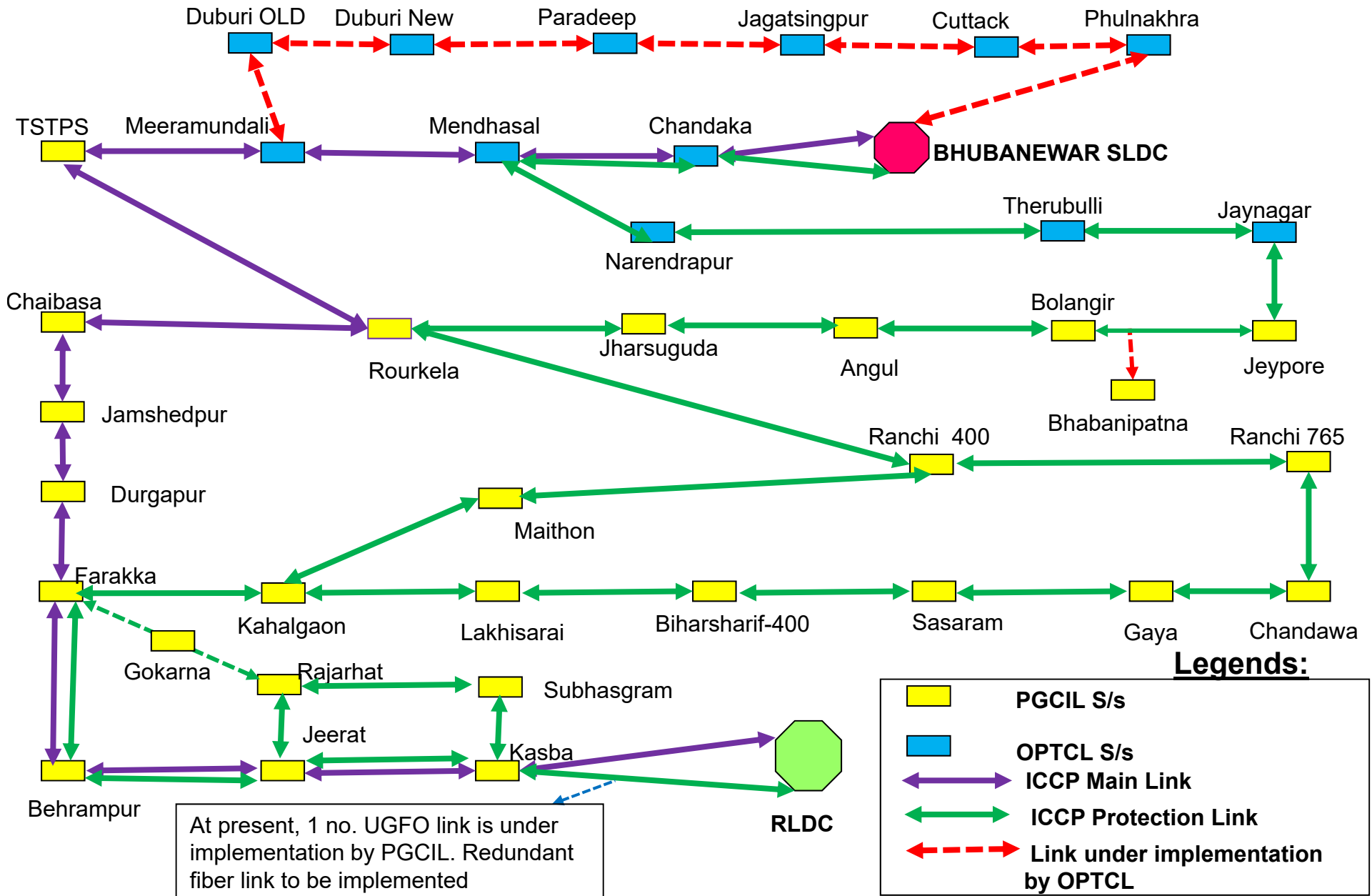


Legends:

	PGCIL S/s
	DVC S/s
	ICCP Main Link
	ICCP Protection Link
	Link under progress
	Under Implementation by PG (DVC network)

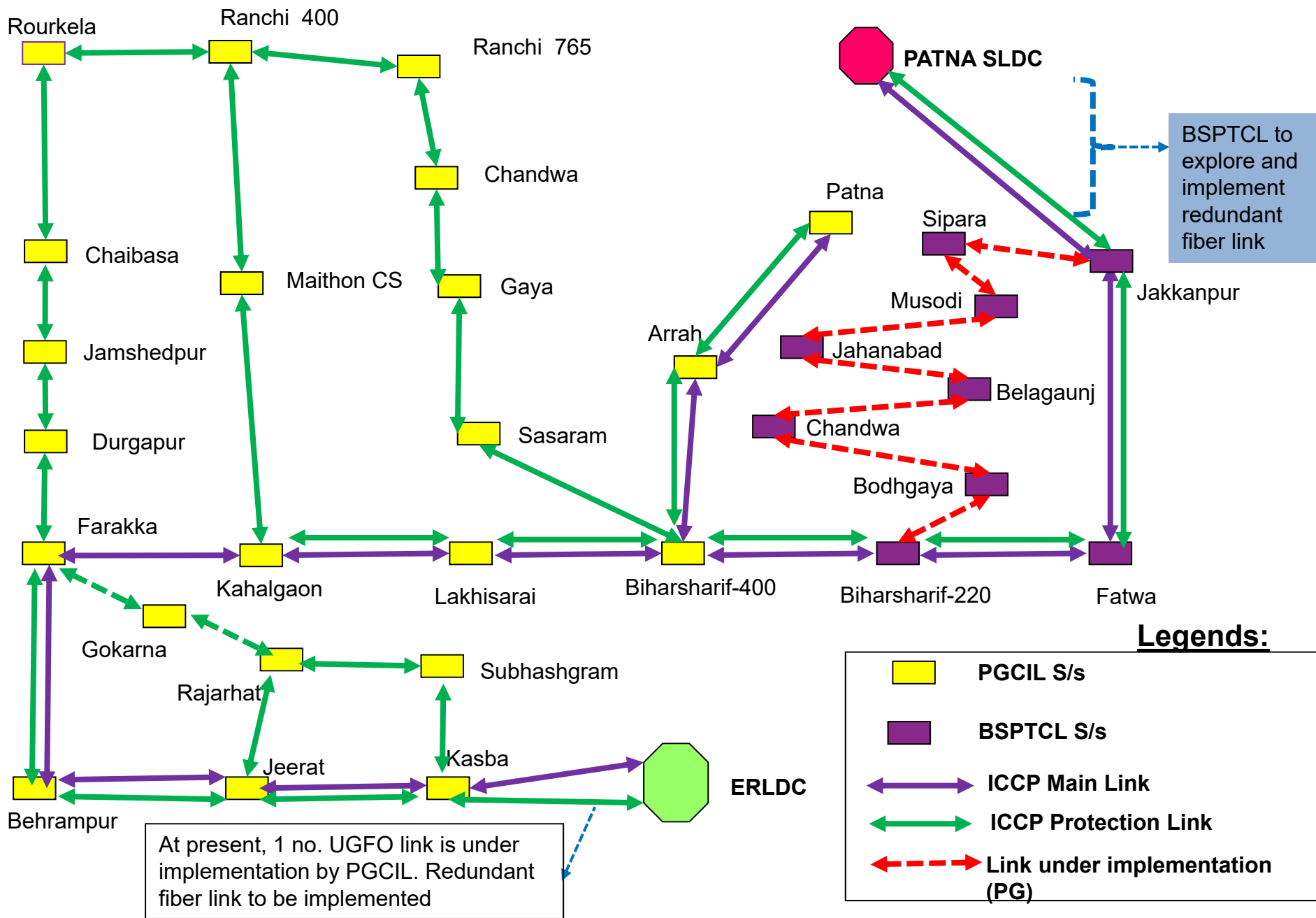
ICCP FLOW OF OPTCL

Annexure - III



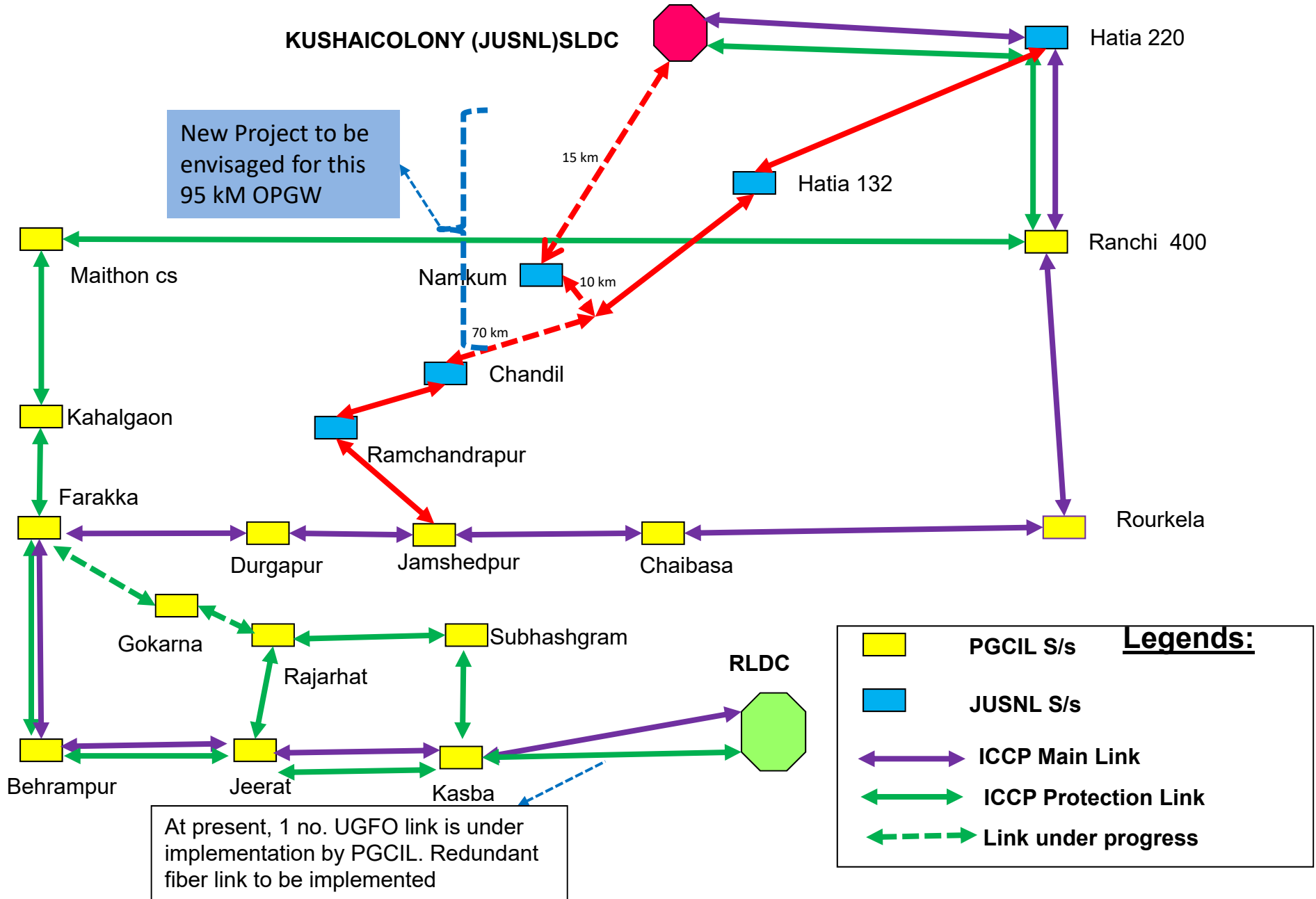
ICCP FLOW OF BSPTCL

Annexure - III



ICCP FLOW OF JUSNL

Annexure - III

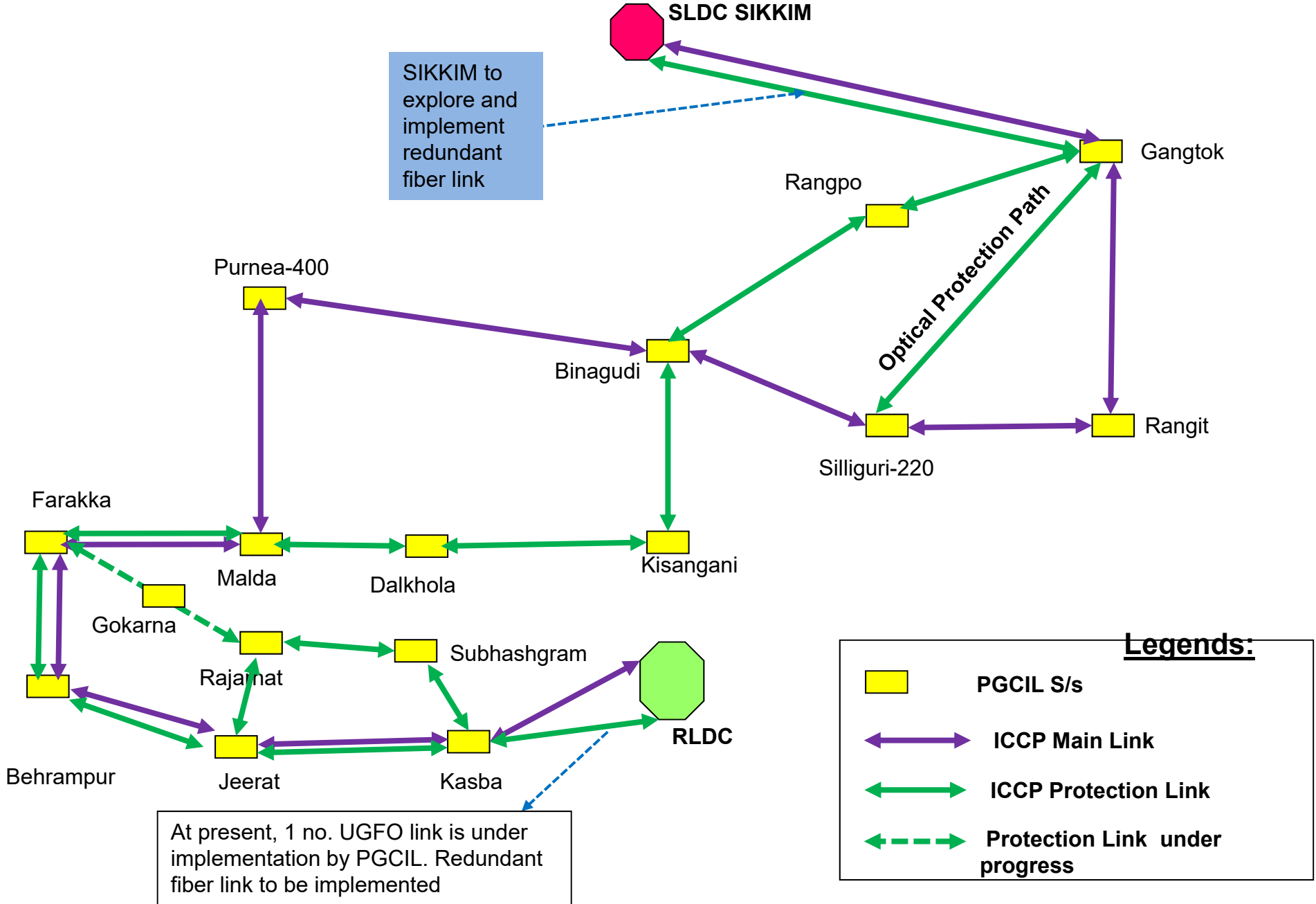


ICCP FLOW OF SIKKIM

Annexure - III

SLDC SIKKIM

SIKKIM to explore and implement redundant fiber link



At present, 1 no. UGFO link is under implementation by PGCIL. Redundant fiber link to be implemented

Legends:

- PGCIL S/s
- ICCP Main Link
- ICCP Protection Link
- Protection Link under progress

Revised List of Sub-Stations to be connected with Fibre Optic in Bihar

Sr. No.	Name of Sub-station	kV Level	Link Name	Integration with existing equipment	Length from nearest WB node (in Kms.)	Remarks	S4.1	L4.1	L4.2	upto 150kms	Base Equipment
1	Balmikinagar	132	Ramnagar-Balmikinagar	Ramnagar	78		0	0	1	0	
2	Ramnagar	132/ 33				OPGW layiny considered under BSPTCL Package	0	1	1	0	
3	Dhaka	132/ 33	Motihari-Dhaka	Motihari	25		2	2	1	0	1+1
4	Sitamarhi	132/ 33	Sitamarhi-Dhaka		52		0	2	1	0	
5	Ekma	132/ 33	Siwan-Ekma	Siwan	1	Upto LILO of Chhapra-Siwan	1	0	0	0	
6	Dalsinghsarai	132/ 33	Samastipur-Dalsingsarai	Samastipur	23		1	0	0	0	
7	Samastipur*	132/ 33				OPGW layiny considered under BSPTCL Package	1	1	0	0	
8	Khagaria	132/ 33	BTPS-Khagaria	BTPS	60		1	0	1	1	
9	BTPS*	220/ 132/ 33				OPGW layiny considered under BSPTCL Package	0	0	1	1	
			khagaria-purnia		150		0	0	0	1	
10	Ekansarai	132/ 33	Biharshariff-Ekansarai	Biharshariff	30		1	1	0	0	
11	Biharshariff*	220/132/ 33				OPGW layiny considered under BSPTCL Package	3	2	0	0	1+1
12	Hulasganj	132/ 33	Ekansarai-Hulasganj		15		1	0	0	0	
13	Sheikhpura	132/ 33	Biharshariff-Sheikhpura		20	station planned on new line under BGCL	1	1	1	0	
14	Jamui	132/ 33	Seikhpura-Jamui		55		0	2	1	0	
			Jamui-Lakhisarai	Lakhisarai	35						
15	Lakhisarai	132/ 33				OPGW layiny considered under BSPTCL Package	0	1	0	0	
16	Baripahadi	132/ 33	Biharshariff-Baripahadi		5		1	1	0	0	
17	Rajgir	132/ 33	Nalanda-Rajgir	Nalanda	14		1	0	0	0	
18	Nalanda	132/ 33				OPGW layiny considered under BSPTCL Package	1	0	0	0	
19	Belaganj	132/ 33	Chandauti-Belaganj	Chandauti	20		1	0	0	0	
20	Chandauti	132/ 33				OPGW layiny considered under BSPTCL Package	2	2	0	0	1+1
21	Rafiganj	132/ 33	Chandauti-Rafiganj		41		0	1	0	0	
22	Tekari	132/ 33	Chandauti-Tekari		29		1	1	0	0	
23	Goh	132/ 33	Tekari-Goh		22		1	0	0	0	
24	Vaishali	132/ 33 / 11	Muzaffarpur-Vaishali	Muzaffarpur	30		0	2	0	0	
25	Muzaffarpur	132/ 33				OPGW layiny considered under BSPTCL Package	1	1	0	0	
26	Supaul	132/ 33	Madhepura-Supaul	Madhepura	30		0	4	0	0	1+1
27	Madhepura	220/ 132/ 33				OPGW layiny considered under BSPTCL Package	0	1	0	0	
28	Phulparas	132/ 33	Supaul-Phulparas		32		1	2	1	0	1+1

29	Masrakh	132/ 33	Gopalganj-Masrakh	Gopalganj	40	Upto LILO of Gopalganj-Siwan	1	2	0	0	
30	Gopalgunj	220/132/ 33			Already considered under BSPTCL Package		2	1	1	0	1+1
31	Siwan	132/ 33			OPGW layiny considered under BSPTCL Package		1	2	1	0	1+1
			siwan-Chhapra		70						
32	Mohania	132/ 33	Pusauli(BSEB)-Mohania	Pusauli(BSEB)	10		2	0	0	0	
33	Pusauli(BSEB)	220/132			OPGW layiny considered under BSPTCL Package		2	2	1	0	1+1
34	Jainagar	132/ 33	Madhubani-Jainagar	Madhubani	40		0	2	2	0	
			Jainagar-Phulparas		55		0	0	0	0	
35	Madhubani	132/ 33			OPGW layiny considered under BSPTCL Package		0	2	0	0	
36	Dumraon	132/ 33	Ara(PG)-Dumraon	Ara(PG)	60		1	2	1	0	1+1
			Dumraon-Bikramganj		35		0	0	0	0	
37	Ara(PG)*	220/132	Ara(PG)-Khagaul		56		0	1	2	0	
38	Khagual	220/132/ 33			OPGW layiny considered under BSPTCL Package		2	0	1	0	
39	Buxar	132/ 33	Dumraon-Buxar		17		1	0	0	0	
40	Jagdishpur	132/ 11	Ara(PG)-Jagdishpur		27		0	1	0	0	
41	Digha	132/ 33	Khagaul-Digha	Khagaul	16		1	0	0	0	
42	Bikramganj	132/ 33	Dehri-Bikramganj	Dehri	45		0	2	1	0	
43	Dehri	220/132/33			OPGW layiny considered under BSPTCL Package		1	4	0	1	1+1
44	Banjari	132/ 33	Dehri-Banjari		38		0	1	0	0	
45	Sherghati	132/ 33	Bodhgaya-Sherghati	Bodhgaya	27		0	2	0	0	
46	Bodhgaya*	220/132/ 33			OPGW layiny considered under BSPTCL Package		0	2	0	1	
			Dehri-Gaya(PG)-Bodhgaya		95		0	0	0	0	
47	Wazirganj	132/ 33	Bodhgaya - Wazirganj		30		0	2	0	0	
48	Nawada	132/ 33	Wazirganj - Nawada		26		0	2	0	0	
			Nawada-Biharsharif		41		0	0	0	0	
49	Kishanganj	132/ 33	Forbisganj-Kishanganj	Forbisganj	70		1	1	2	0	1+1
			Katayia-Forbisganj		50		0	0	0	0	
50	Kataiya (Birpur)	132/ 33	Supaul- Kataiya		40		0	1	1	0	
51	Katihar	132/ 33	Purnea-Katihar	Purnea	29		1	1	0	0	
52	Purnea	132/ 33			OPGW layiny considered under BSPTCL Package		2	4	2	2	1+1+1
53	Forbishganj	132/ 33	Purnea-Forbishganj		85		1	1	3	0	1+1
54	Mithapur	132/ 33	Sipara-Mithapur	Sipara	16	station planned on new line under BGCL	2	0	0	0	
55	Sipara	220/132/ 33			OPGW layiny considered under BSPTCL Package		3	0	1	0	1+1
56	Jakkanpur		Jakkanpur-Sipara		10		1	0	0	0	
57	Bihta	132/ 33	Khagaul-Bihta		15	station planned on new line under BGCL	2	0	0	0	

58	Naugachia	132/ 33	Purnia-Naugachia		70		0	1	1	1	
			Naugachhia-BTPS	BTPS	136		0	0	0	0	
59	Karamnasa	132/ 33	Mohania-Karamnasa		11		1	0	1	0	
			Karamnasa-Pusauli(BH)	Pusauli(BH)	60	Trans.Line through Kudra TSS	0	0	0	0	
60	Harnaut	132/ 33	Baripahadi-Harnaut		26		0	1	0	0	
61	Karpi (Ataula)	132/ 33	Jehanabad - Ataula		28		0	1	0	0	
62	Jehanabad	132/ 33				considered under ULDC scheme	0	2	0	0	
63	Raxaul	132/ 33	Bettia - Raxaul		38		0	1	1	0	
64	Bettiah	132/ 33				OPGW layiny considered under BSPTCL Package	0	5	1	0	1+1
			Bettiah-Gopalganj		60		0	0	0	0	
65	Imamganj	132/ 33	Imamganj - Sherghati		30		0	1	0	0	
66	Tehta	132/ 33	132 KV Chandauti/ Jehanabad LILO-Tehta		6		2	0	0	0	
67	Udakishanganj	132/ 33	Saharsa - UdaKishanganj	Saharsa	51		0	0	1	0	
68	Saharasa	132/ 33				OPGW layiny considered under BSPTCL Package	0	1	2	0	
69	Karbigahiya	132/33	Karbigahia-Mithapur		3	Arial/UG fibre required as line is underground	1	0	0	0	
70	Kochas	132/ 33	Kudra - Kochas		35		1	2	0	0	
			Dumraon-Dehri LILO Kochas		29	Distance b/w LILO point to Kochas gss is 29km	0	0	0	0	
71	Kudra GSS	132/33	Kudra-Dehri		26		1	2	0	0	
			Kudra-Pusauli(PG)		10		0	0	0	0	
72	Pusauli(PG)*					OPGW layiny considered under BSPTCL Package	1	0	0	0	
73	Shekhpura	132/ 33	Hathidah - Shekhpura	Hathidah	28		0	1	0	0	
74	Hathidah	132/ 33				OPGW layiny considered under BSPTCL Package	0	1	0	0	
75	Jandaha	132/ 33	Samastipur/Hazipur LILO Jandaha		35		1	2	0	0	
76	Hajipur*	132/33				OPGW layiny considered under BSPTCL Package	0	1	0	0	
77	MTPS*	220/ 132/ 33				OPGW layiny considered under BSPTCL Package	0	0	0	0	
78	Sitalpur	132/33	Sitalpur-Vaishali		31		0	2	0	0	
79	Chhapra	132/ 33	Chhapra-Sitalpur		40		0	1	2	0	
80	Begusarai	220/ 132/ 33				OPGW layiny considered under BSPTCL Package	2	3	0	0	1+1
81	Kahalgaon(NTPC)*					OPGW layiny considered under BSPTCL Package	0	0	0	0	
82	Kahalgaon	132/ 33				Already considered under BSPTCL Package	0	1	0	0	
83	Sabour	132/ 33				OPGW layiny considered under BSPTCL Package	1	1	0	0	
			Kahalgaon-sabour		25		0	0	0	0	
84	Fatua	220/132/ 33				OPGW layiny considered under BSPTCL Package	0	0	0	0	

85	Ara(Bihar)	132/ 33			OPGW layiny considered under BSPTCL Package	0	0	0	0
86	Sultangunj	132/ 33			OPGW layiny considered under BSPTCL Package	1	1	0	0
87	Jamalpur	132/ 33			OPGW layiny considered under BSPTCL Package	0	1	0	0
88	Lakhisarai(PG)*	132/ 33			OPGW layiny considered under BSPTCL Package	0	0	0	0
89	Sonenagar	132/ 33			OPGW layiny considered under BSPTCL Package	0	0	0	0
90	Sasaram(BSEB)	132/ 33	Sasaram-Dehri	Dehri	20	2	0	0	0
			Sasaram-Pusauli(BH)	Pusauli(BH)	18	0	0	0	0
91	SKMCH	132/33			Already considered under BSPTCL Package	1	1	0	0
			SKMCH-Muzaffarpur		15	0	0	0	0
92	Runisaidpur	132	Runisaidpur-SKMCH	SKMCH	35	0	1	0	0
93	Darbhanga	220/132/ 33			OPGW layiny considered under BSPTCL Package	0	0	0	0
94	Gangwara	132/ 33			OPGW layiny considered under BSPTCL Package	0	0	0	0
95	Pandaul	132/ 33			OPGW layiny considered under BSPTCL Package	0	0	0	0
96	Purnea(PG)*		Purnea(PG)-Purnea(BH)	Purnea(BH)	2	1	0	0	0
97	Motihari	132/ 33			OPGW layiny considered under BSPTCL Package	1	0	0	0
98	Barh	132/ 33	Barh-Biharsharif		25	1	0	0	0
99	Barh(NTPC)*				OPGW layiny considered under BSPTCL Package	0	0	0	0
100	Banka	132/ 33			OPGW layiny considered under BSPTCL Package	0	2	0	0
101	Banka(PG)*				OPGW layiny considered under BSPTCL Package	0	0	0	0
2703						37	34	22	6

List of Upcoming/underconstruction gss to be connected with Fibre

1	Motihari new	400/132	Motihari new- Motihari old		15	1	1	1	0
			Motihari new- Bettiah		36	0	0	0	0
			Motihari new- Raxaul		56	0	0	1	0
2	Dhanaha	132/33	Dhanaha- Bettiah		35	0	1	0	0
3	Patna(PG)		Patna(PG)- Sipara		1	1	0	0	0
4	Bihta new	220/132/33	Bihta new- Sipara		60	1	0	1	0
			Bihta old-Bihta new		5	0	0	0	0
5	Khagaria new	220/132/33	Khagaria old/purnia lilo khagaria new		10	1	0	0	1
6	Sheohar	132/33	Sitamarhi/ dhaka lilo Sheohar		2	1	0	0	0
7	RamGarh	132/33	Pusauli new/ Kochas lilo Ramgarh		20	1	0	0	0
8	Waisali Ganj	132/33	Biharsharif/ nawada lilo waisali ganj		40	0	1	0	0
9	Jamui new	132/33	jamiu old- jamui new		30	0	2	0	0

			Jamui new- banka new		35		0	0	0	0	
10	Banka new	132/33	Banka old Banka new		30		0	1	0	0	
11	Siwan new	132/33	Chhapra old/ chhapra new lilo siwan new		5		0	1	1	0	
12	Nathnagar	132/33	Sabour-Sultanganj LILO Nathnagar		10		1	1	0	0	
13	Korha	132/33	Purnea-Naugachhia LILO Korha		20		0	1	1	0	
14	Piro	132/33	Piro - Bikramganj		23		1	0	0	0	
15	bhabua	132/33	Bhabuba-Pusauli new		33		0	1	0	0	
16	Tarapur	132/33	Jamalpur/ Sultanganj lilo tarapur		16		1	1	0	0	
17	Manihari	132/33	Purnia/ Katihar lilo Manihari		12		1	1	0	0	
18	Barsoi	132/33	Barsoi- Kisanganj new		70		0	0	1	0	
19	Dhamdaha	132/33	Purnia/Saharsa lilo Dhamdaha		1		1	1	0	0	
20	Baisi	132/33	Kisanganj old-Baisi		1		1	0	0	0	
21	Nirmali	132/33	Phulpras/Supaul lilo- Nirmali		15		1	1	0	0	
22	Trivaniganj	132/33	Purnia/ Forbisganj lilo Trivaniganj		15		1	1	0	0	
23	Shahpurpatori	132/33	Shahpurpatori- Samastipur new		31		0	1	0	0	
24	Samastipur New	220/132/33					0	1	0	0	
25	Rosera	132/33	Begusarai/Kusheshwarasthan lilo Rosra		9		1	1	0	0	
26	Kusheshwarsthan	132/33					0	1	0	0	
27	Simri Bhatiyarpur	132/33	Simri Bhatiyarpur- Sonebarsa		16		1	0	0	0	
28	Sonebarsa	132/33					1	0	0	0	
29	Jhanjharpur	132/33	Jainagar/Phulparas lilo Jhanjharpur		35		0	2	0	0	
30	Benipatti	132/33	Madhubani/Jainagar LILO Benipatti		12		2	1	0	0	
31	Pupri	132/33	Pupri - Benipatti		32		0	1	0	0	
32	Belsand	132/33	Dhaka/Sitamarhi LILO Belsand		9		0	2	0	0	
33	Maharajganj	132/33	Maharajganj-Mashrakh		20		1	0	0	0	
34	Hathua	132/33	Gopalganj/Siwan LILO Hathua		8		1	1	0	0	
35	Pakridayal	132/33	Pakridayal-Dhaka		20		1	0	0	0	
36	Areraj	132/33	Gopalganj/Bettia LILO Areraj		15		1	1	0	0	
37	Chakia	132/33	Chakia-Motipur new		40		0	1	0	0	
38	Motipur New	220/132					0	1	0	0	
39	Narkatiyaganj	132/33	Bettia/Ramnagar LILO Narkatiyaganj		15		0	2	0	0	
40	Banmankhi	132/33	purnia/Saharsa LILO Banmankhi		2		1	0	1	0	
41	Mahanr	132/33	Mahnar-Jandaha		10		1	0	0	0	
42	Bakhari	132/33	Bakhari-Begusarai		20		1	1	0	0	
43	Balia	132/33	Begusarai/Bakhari LILO Balia		11		1	2	0	0	
44	Manjhaul	132/33	Begusarai/Bakhari LILO Manjhaul		2		2	0	0	0	
45	Teghra	132/33	Begusarai-Teghra		40		0	1	0	0	
46	Araria	132/33	Kishanganj old/Forbisganj LILO Araria		1		0	2	0	0	
Total					944		9	29	4	1	
Total					2703+944=3647						

List of sub-stations and Lines Deleted(already considered in Transmission/ULDC scheme of BSPTCL)

2	Masaudi	132/ 33	Jehanabad-Masaudi		30	considered under ULDC scheme	0	1	0	0
3	Sonebarsa		Madhepura-Sonebarsa		50	considered under ULDC scheme	0	0	1	0
4	Kusheshwarsthan	132/ 33	Sonebarsa - Kusheshwarsthan		75	considered under Tr. scheme	0	0	1	0
5	Hajipur 132kV	132/ 33	Hazipur (220KV)-Hazipur (132KV)		2	considered under ULDC scheme	1	0	0	0
			Sipara-Masaurhi		24	considered under ULDC scheme				
			Sipara-Khagaul		8	considered under ULDC scheme				
			Banka-Banka(PG)-sabour		25	considered under ULDC scheme				
			Dehri-Sonenagar		30	considered under ULDC scheme				
			Muzaffarpur-Vaishali		30	already considered at sr no. 18				