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भारत सरकार
Government of India
उत्तर क्षेत्रीय विद्युत समिति
Northern Regional Power Committee
18-ए, शहीद जीत सिंह मार्ग, कटवारिया सराय नई दिल्ली - 110016
18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016

उ. क्षे. वि. स./अधीक्षण अभियंता (प्रचालन)/insulators/2010 दिनांक 23.08.2010

To

1. CMD, POWERGRID, Gurgaon
2. Chairman, BBMB, Chandigarh, Fax No 0172- 2549186, 2652820
3. CMD, DTL, New Delhi Fax No 011 23234640
4. CMD, PSTCL, Ablowal, Patiala
5. MD, HVPNL, Panchkula Fax No 0172-2560640
6. CMD, RRPVNL, Jaipur Fax No 0141- 2740168
7. MD, UPPTCL, Lucknow Fax No 0522- 2287880/ED UPPTCL, Lucknow
8. Director (Electrical), Railway Board, New Delhi, 011- 23387045,
9. CED, North Central Railway, Allahabad, 0532-2223211, 2230204
10. CEO, Powerlinks Transmission Limited, New Delhi, Fax-01166306375
11. GM (O&M), POWERGRID, NR-I
12. GM (O&M), POWERGRID, NR-II
13. GM (OS), NTPC, NCR, Noida;
14. AGM (OS), NTPC NR, Lucknow,

Subject: Minutes of the meeting on replacement of insulators in Northern Region

Sir,

A meeting was held with the constituents of Northern Region on 23-07-2010 to review the progress replacement of porcelain insulators with polymer/antifog insulators in high pollution areas of Northern Region.

Minutes of the aforesaid meeting are enclosed. Copy of the same is also available on website of NRPC (www.nrpc.gov.in).

Yours faithfully

Ajay Talegaonkar 23.08.2010

(Ajay Talegaonkar)

SE (Operations)

Encl: As above

Copy to : GM, NRLDC, New Delhi

Minutes of the meeting taken by Member Secretary, NRPC on 23rd July, 2010 regarding replacement of porcelain insulators with polymer/antifog insulators on transmission lines in NR.

List of participants is enclosed at Annex-I.

1. MS, NRPC, welcomed the participants in the special meeting to review the progress of replacement of porcelain insulators with polymer insulators in the Northern Region. He stated that the objective of the meeting is to assess the progress made so far in replacement of insulators, take stock of the preparedness for completing the remaining work in the already identified lines and to sensitize the transmission utilities about need for identifying new lines in the smog prone area in light of recommendations of the inquiry committee of 2nd January, 2010. He stated that the issue was also discussed during 16 and 17 NRPC meetings held on 16 April and 17 July, 2010 respectively wherein transmission utilities were requested to identify additional lines for replacement of porcelain insulators by Polymer or Antifog insulators. He stated that for the sake of clarity, it is advisable to categorize the transmission lines in two categories – stage-I, consisting of lines which were identified consequent to grid disturbance in March 2008 and stage-II, which will contain lines which have been identified or will be identified subsequent to grid disturbance in January 2010.

2. MS, NRPC intimated that POWERGRID had intimated that they have identified about 34 lines for replacement of insulators in stage-II. He requested that other transmission utilities in the region should also identify and make action plan so that replacement is completed by November/December, 2010.

3. The utility-wise status as updated during the meeting is as under:

4. **Punjab**

4.1 Representative of Punjab State Transmission Co. Ltd. (PSTCL) stated that they were in the process of identifying new lines where insulators need to be replaced. The pollution zone in Punjab includes Ludhiana, Bhatinda and Ropar Area. He intimated that PSTCL will replace Polymer insulators (90kN) on 220kV lines. Since 90kN Polymer insulators were not readily available in the store, they would be procuring such insulators. PSTCL is likely to place the order during the month of August, 2010. He stated that due to ongoing paddy season, it would not be possible to replace the insulators on the lines before Oct, 2010. He informed that the replacement process will start after mid

October and would be completed by 15th December, 2010. MS, NRPC requested PSTCL to submit details of lines where replacement were planned in stage-II, status of procurement and expected date of delivery of material to NRPC secretariat. Representative of PSTCL agreed to submit the same by 31st July, 2010.

4.2 Subsequent to the meeting, PSTCL has submitted the information. They have intimated that 287 nos. insulators have been replaced with antifog insulators in the period from September'09 to March'10. Further, in the current year, 10 nos. of insulators have been replaced so far (upto 31.07.2010) with antifog insulators. Afterwards in stage-II, some new lines were identified falling under polluted areas where ordinary discs are required to be replaced with antifog/polymer insulators. List of such lines under Stage-I and stage-II is attached as **Annex- II**.

4.3 Regarding procurement of antifog discs, the LoI for the following quantity has been placed by PSTCL on three firms namely Bikaner Ceramics, Jai Maa ceramics and IEC Bhopal on 04.08.2010. This quantity includes the requirement for new lines to be erected in polluted areas.

70 KN	28350 nos.
90 KN	15000 nos.
160 KN	37000 nos.

4.4 The delivery of the material shall start from October 2010 and as the quantum required for the replacement of insulators on existing lines is only about 13867 nos. which shall be received in the first lot expected in October-2010. Thereafter the replacement work can be completed before the onset of foggy weather. The creepage distance of the anti-fog insulators being procured is 432 mm for 70 and 90 KN and 475 mm for 160 KN.

5. **Haryana**

Representative of HVPNL stated that they had identified 13 additional lines, 9 emanating from PTPS and 4 lines feeding to Railways for replacement of insulators in Stage-II. MS, NRPC requested HVPNL to submit details of status of procurement, expected delivery of material and target date of completion to

NRPC secretariat by 31st July, 2010 He advised HVNNL and PSTCL to complete the replacement by end of November, 2010. **The Information from HVPNL was not received till the issuance of these minutes.** However, progress of work in Haryana under stage-I and list of lines identified for stage-II as furnished in the meeting are attached as **Annex-III**.

6. **Delhi**

6.1 400kV lines

Representative of DTL intimated that about 3325 nos of Polymer insulators were yet to be replaced on the transmission lines identified in Stage-I. He stated that because paddy season, the work could not be taken up now . The replacement of these insulators on 400kV lines would be taken up after October 15, 2010. DTL was advised to employee more number of gangs for the execution of work so that work gets completed before the onset of winter.

6.2 220kV lines

MS, NRPC also requested DTL to submitted the status of replacement of Porcelain insulators by antifog /Polymer on 220 kV lines. DTL agreed to summit the details including types of insulators, placement of order, delivery schedule and schedule for replacement to NRPC secretariat by 26th July 2010. **However, no information from DTL has been received till the issuance of these minutes.**

6.3 Progress of work in Delhi as available with NRPC Secretariat is attached as **Annex-IV**.

7. **POWERGRID**

7.1 GM(O&M- NR-I), POWERGRID stated that under stage-I, they had identified 38 lines in phase-1, out of which they had fully completed 21 lines. These lines are in high pollution zone and include lines like 400 kV Meerut-Mandola D/C, Dadri -Maharani Bagh, Mainpuri- Ballabhgarh and Dadri Malerkotla falling in NCR area. Out of 17 remaining lines, more than 75% work has been completed on 8 lines. For the balance lines, the work is held up because POWERGRID could not get the supply of insulators from Brazil and now they have arranged supply from China. The supply from China which was expected in 2-3 months and work would be taken up thereafter. The details of lines as per phase wise are placed at **Annex- V.**

7.2 Regarding new lines POWERGRID stated that 36 numbers had been indentified for replacement under stage-II. These include 22 numbers from NR-I and 9 lines of NR-II which were partially completed during the stage-1. The

total cost involved is about Rs 144 crores. Approval has been received and tender for the work would be floated in August 2010. The delivery of the material is expected to start in October 2010.

7.3 POWERGRID intimated that they have included requirement of BBMB also in this quotation. GM(O&M- NR-I), POWERGRID stated that if any other transmission utility want POWERGRID to procure polymer insulators on its behalf, they might approach POWERGRID at the earliest. PSTCL stated that they would intimate the requirement to POWERGRID, if their management approves the procurement through POWERGRID.

7.4 Regarding Rihand -Dadri HVDC bi-pole, POWERGRID intimated that around 1973 insulators were available for these lines and around 70 percent work have been completed so far. The remaining work beyond Aligarh would be taken up shortly. They intimated that they would cover about 461 km out of 815km length of the HVDC bipolar.

7.5 MS, NRPC, inquired about failure of one tension string at Dadri end. POWERGRID intimated that at Dadri switchyard, silicon grease has been coated to avoid tracking due to fog. However, the location at which the string failed was such that silicon grease could not be applied properly. They have replaced this string also.

7.6 MS, NRPC requested POWERGRID to complete replacement works at critical locations/lines on priority basis. POWERGRID agreed to submit list of such prioratized work to NRPC secretariat.

8. UP and BBMB

8.1 No representative from BBMB and UPPTCL attended the meeting. Representative of HPVNL stated that the tripping in Haryana system during the last winter, particularly during grid disturbance on 2nd January, 2010 were due to depletion of network of BBMB system. BBMB need to expedite the replacement of insulators.

8.2 Progress of work in UP and BBMB systems as available in NRPC Secretariat is attached as **Annex-VI** and **Annex-VII** respectively.

Meeting ended with vote of thanks to the Chair.

Annex-I

List of Participants of the Meeting on Polymer Insulator

In chair- Shri A K Aggarwal, MS, NRPC

POWERGRID

Name of officer Shri.	Designa-tion	Organization	Mobile No.	Email id
B. Sharma	GM	POWERGIRD	9958555761	
R.K. Sharma	Manager	POWERGIRD NR-I	9873918545	raviksin@yahoo.com
Mohommad Farooq	Dy. Mgr.	POWERGRID NR-II	09419211848	rhqjammu@yahoo.co.in

DTL

P.P. Singh	Mgr.(T)	DTL	9540040643	

NRLDC

Alok Kumar	Manager	NRLDC	9999039321	alokwaghela@hotmail.com
Rajesh Kumartha	Engineer	NRLDC	9971954982	rajesh272ee@ggmai.com

PSTCL

N.K. Sharma	Dy CE	PSTCL	9646118204	minvysharma2006@yahoo.co.in

HVPN

Sanjay Arora	PR	HVPN	9356273746	pchvph1@gmail.com

NRPC

Ajay Talegaonkar	SE(O)	NRPC		nrebops@yahoo.com
Vikram Singh	EE(O)	NRPC	9868893051	vikramsinghnrpc@gmail.com
Ashwini Kumar	Sr. Manager	NRPC		

Annexure-II

Punjab- Lines under Stage-I

Sr. No.	Name of P&M Circle	No. of Discs to be replaced	No. of Discs replaced
	P&M Circle Ludhiana		
1	220kV RTP-Gobindgarh-II	126	
2	220kV RTP-Gobindgarh-IV	126	
3	220kV RTP-Gobindgarh-I	84	
4	220kV RTP-Gobindgarh-III	84	
5	220kV Gobindgarh-I-Gobindgarh-II	126	
6	220kV Gobindgarh-I-Gobindgarh-II	126	
7	220kV Jamalpur Ganguwal I&II	756	
	P&M Circle Patiala		
1	220kV Ablowal-fagan Majra	336	
2	220kV Ablowal-fagan Majra		
	P&M Cirlce Bathinda		
1	220kV Botian wala-Ferozpure	80	
2	220kV Mogar-Ferozpure	80	
3	220kV Bathinda-Mukatsar	504	
4	132kV Bathinda-Balluana	100	
5	132kV Bathinda-Gidderbaha-Malout	100	
6	132kV Sadiq-Ferozpur	150	
7	132kV Kot Karor-Firozshah	50	
8	220kV GNDTP-Lehra Mohabat	500	
9	132kV GNDTP-Balluana	250	
10	132kV Moga Jamalpur	100	
	P&M Circle Jallandhar		
1	220kV Dasuya-Jallandhar	213	
	Total (20 lines)	**3891**	**297**

Punjab- Lines under Stage-I I

	P&M Circle Ludhiana		
1	220kV Jamalpur-Dhandari-I&II	168	
2	220kV RTP-Sahnewal	336	
3	220kV Sahnewal-Lalton-I&II	336	
4	220kV Dhandari-Lalton-I&II	336	
5	132kV Jamalpur-Ghulal Ckt-I	157	
6	132kV Jamalpur-Ghulal Ckt-II	135	
7	132kV Jamalpur-Phillaur	54	
8	132kV Jamalpur-Goraya	54	
	P&M Cirlce Bathinda		
1	220kV Jagraon Moga I&II	80	
2	220kV Mukatsar-Ghubya	40	
3	132kV Mukatsar-Kotkapur-Moga	50	
4	132kV Mukatsar-Sarainaga-Moga-I	50	
5	132kV Mukatsar-Jalalabad	50	
6	220kV GNDTP-Bathinda-Mukatsar-I&II	600	
7	220kV Lehra-Mohabat-Baja Khana	600	
8	132kV GNDTP-IES	250	

9	132kV GNDTP-ICG BATHINDA	250	
10	132kV GNDTP-NFL Bathinda-I&II	200	
11	132kV Moga-Jamalpur-I&II	450	
	P&M Circle Patiala		
1	220kV Fagan Majra-Rajpura-Bhteri	2156	
2	220kV Ablowal-Gobindgarh I&II	180	
	P&M Circle Jallandhar		
1	220kV Jamsher-Mahilpur	720	
2	220kV Jamsher Kotla	420	
3	220kV Jamsher-BBMB	252	
4	220kV Jamsher-RTP	84	
5	220kV Jamsher-Goraya	84	
6	220kV PGCIL-Kanarpur	51	
7	220kV PGCIL-Kotla Janga	51	
8	132kV BBMB Jallandhar-Phagwara	16	
9	132kV PIMS Jallandhar Science City	16	
10	132kV Mukerian Tanda-Bhogpur	48	
11	132kV Mukerian Bhogpur	48	
12	132kV Jallandhar-Kanpur	72	
13	132kV Kanpur Bhogpur	24	
14	132kV Jallandhar-Alawalpur	96	
	Total (35 lines)	**8514**	

Annexure-III

Status on 23.07.2010

Haryana (HVPNL)- Lines under Stage-I

Polymer insulators

Sl. No.	Name of line	Line Length			Length where insulators to be replaced							
		Kms	No. of locations	Total Insulator Strings to be replaced (Nos)	Kms	No. of locations	Total Insulator Strings required (Nos)	Insulator Strings replaced (Nos)	Completion (%)		Schedule for replacement of balance	
											Start Date	End Date
1	220KV Sewah-PTPS Ckt-I	12		198	12		198	198	100	completed		
2	220KV Sewah-PTPS Ckt-II	12		198	12		198	198	100	completed		
3	220KV Sewah-PTPS Ckt-III	12.5		213	12.5		213	213	100	completed		
4	220KV Sewah-PTPS Ckt-IV	12.5		213	12.5		213	213	100	completed		
5	220KV PTPS -Sonepat Ckt-I	51.5		634	51.5		634	600	95			
6	220KV PTPS -Sonepat Ckt-II	51.5		634	51.5		634	600	95			
7	220KV Nuna-Majra-B/garh(400KV) Ckt-I	2.9		42	2.9		42	42	100	completed		
8	220KV Nuna-Majra-B/garh(400KV) Ckt-II	2.9		42	2.9		42	42	100	completed		
9	220KV Rohtak-B/garh Ckt-I	46		576	6		576	576	100	completed		
10	220KV Rohtak-B/garh Ckt-II	46		576	46		576	576	100	completed		
11	220KV Rohtak-PTPS Ckt-I	63		726	63		726	Nil				
12	220KV Rohtak-PTPS Ckt-II	63		726	63		726	Nil				
13	220KV Pali-Samaypur Ckt-I	13.9		342	13.9		342	63				
14	220KV Pali-Samaypur Ckt-II	13.9		342	13.9		342	63				
15	220KV Pali-Palla Ckt-I	10		414	10		414	72	17			
16	220KV Pali-Palla Ckt-II	10		414	10		414	74				
17	220KV Samaypur-Palwal Ckt-I	18.91		288	18.91		288	288	100	completed		
18	220KV Samaypur-Palwal Ckt-II	18.91		288	18.91		288	156	54			
19	220KV Badshahpur-Rewari D/C line	70.3		1410	70.3		1320	12				
20	220KV D/C Sec- 52-A-Pali line	23	89	690	23	89	690	Nil				
21	220KVBadshahpur-Samaypur D/C	24	86	642	24	86	642	309				
22	220KV Badshahpur-Pali D/C	24	86	726	24	86	726	306				
23	220KV S/C Badshahpur--IMT Manesar	11.772		240	11.772		240	24				
24	220KV D/C Daultabad-IMT Manesar	17.996		594	17.996		594	594				
25	220KV D/C Nuna-Majra-Daultabad	29.898		666	29.898		666	666	100	completed		
	Total	662.39		11834	622.39		11834	5885	50			

Stage-I I - Additional lines identified by HVPNL

Sl. No.	Name of line
2	220kV PTPS Ckt-II- Safedon
3	220kV PTPS Ckt-III- Safedon
4	220kV PTPS Ckt-IV- Safedon
5	220kV PTPS-JIND -I
6	220kV PTPS-JIND -II
7	220kV PTPS-NISSING-I
8	220kV PTPS-NISSING-II
9	220kV PTPS-KARNALS/C
10	220 kv Abdullapur(PG)- Deewana-I
11	221 kv Abdullapur(PG)- Deewana -II
12	132 kV PTPS-Deewana-I
13	133 kV PTPS-Deewana-II

Annex-IV

Delhi- Transmission lines under Stage-I **Status on 23.07.2010**

S.No.	Name of the Line	% of total length of line planned for polymer Insulators	No. of locations on which insulators were to be replaced	No. of Insulator strings Required to be Replaced	Progress of work: No. of locations on which insulators replaced	Progress of work: No. of Insulator strings Replaced	Progress of work: % of completion (on insulator strings)	Schedule for replacement of balance: Date of start	Schedule for replacement of balance: Date of Completion
	400kV Lines (Polymer)								
1	Bamnauli-Ballabhgarh I&II	100	149	3500		3100	89	Oct-10	Nov-10
2	Mandaula-Bawana	100	68	620		454	73	Oct-10	Nov-10
3	Bawana-Bamnauli	100	103	761		694	91	Oct-10	Nov-10
	total replaced					4248			
	220kV D/C lines (Antifog)								
1	Mandaula-Narela		73	561			0		
2	Narela-Bawana		41	348			0		
3	Bawana-Shalimarbagh		55	522			0		
4	Shalimarbagh-Rohini		27	312			0		
5	Bawana-Rohini		54	456			0		
6	Bawana-Najafgarh		77	540			0		
7	Bamnauli-Najafgarh		29	210			0		
8	Bamnauli-Pappankalan-I		51	534			0		
9	Bamnauli-Pappankalan-II		62	636			0		
10	Bamnauli-Naraina		99	1098			0		
11	Bamnauli-Mehrauli		52	462			0		
12	Mehrauli-Vasant Kunj		37	471			0		
13	Mandaula-SOW I&II		54	591			0		
14	Mandaula-SOW III&IV		54	591			0		
15	SOW-Kashmere Gate		24	389			0		
16	Maharanibagh-Lodhi Road		30	486			0		
17	BTPS-Okhla		36	516			0		
18	Mandaula-Goplalpur		82	1038			0		
19	BTPS-Mehrauli		68	951			0		
20	IP Station-Patparganj		12	114			0		
				10826					

Annexure- V

POWERGRID -Status of erection of polymer insulators as on 23.07.2010								
Sl. No	**Name of line**	**Total Locations (No)**	**Total Polymer Strings Required (No)**	**Location Replaced(No)**	**Polymer Insulator strings replaced**	**% Complete**	**Schedule for replacement of balance**	
							Date of commencement	Date of completion
Stage -I								
NRTS-I								
Phase -I								
1	400 KV Meerut-Mandola-I	166	1284	166	1284	100.00		
2	400 KV Meerut-Mandola-II	166	1284	166	1284			
3	400 KV Dadri Mandola-I	124	1338	124	1338			
4	400 KV Dadri Mandola-II	124	1338	124	1338			
5	400 KV Dadri-Panipat-I	301	1515	301	1515			
6	400 KV Dadri-Panipat-II	328	1731	328	1731			
7	400 KV Dadri-M'Kotla	282	1374	282	1374			
8	400 KV Dadri-G. NOIDA	37	429	37	429			
9	400 KV G.NOIDA-Ballabgarh	107.5	1270	107.5	1270			
10	400 KV Dadri - Maharanibagh	67.5	730	67.5	730			
11	400 KV Maharanibagh-Ballabgarh	89	1122	80	1122			
12	400 KV S/C Hissar-Bhiwadi (up to LILO point)	360	2556	305	1920	75	'OCT 10	'OCT 10
13	400 KV Mainpuri-Ballabgarh-I	354	1377	283	1146	83	'OCT 10	'OCT 10
14	400 KV Mainpuri-Ballabgarh-II	362	1473	279	1229	83	'OCT 10	'OCT 10
15	400 KV S/C Kanpur-Ballabgarh	628	2943	628	2943	100		
16	± 500 KV HVDC Rh-Dadri P-I	885	2304	588	1568	68	NOV 10	NOV 10
17	± 500 KV HVDC Rh-Dadri P-II	885	2304	610	1568	68	NOV 10	NOV 10
In Phase- II								
1	400 KV S/C Ballabgarh-Bhiwadi	132	508	132	508	100		
2	400 KV S/C Agra-Ballabgarh	283	1348	283	1348	100		
3	400 KV Dadri-Muradnagar	90	548	87.5	500	91	In Opportunity S/D	
4	400 KV S/C Bhiwadi-Bassi -I	353	1347	350	1347	100		
5	400 KV M'nagar-Muradabad	356.5	1771	356.5	1771	100		
6	400 KV S/C Meerut-Muzaffarnagar	107	556	107	556	100		
7	220 KV FGPP-Palla I	54	225	38	171	76		
7	220 KV FGPP-Palla II	54	238	32	163	68		
8	220 KV FGPP-Samaypur I	64	300	64	300	100		
9	220 KV FGPP-Samaypur II	64	292	0	199	68		
In Phase-III								
1	400 KV S/C Bhiwadi -Bassi-II (LILO of Old Bassi-Hissar)	55	420	55	420	100		
2	400 KV Agra-Bhiwadi-I	198	702	0	0	NIL	Shall be taken up after receiving Insulators under	
3	400 KV Agra-Bhiwadi-II	205	786	0	0	NIL		

4	LILO of 400 KV Bly-Mandola at Meerut	22	102	0	0	NIL	Insulators under PCK-C	
5	LILO of 400 KV Ballabgarh-Bhiwadi at G'Gaon	109	1716	40	276	16	Being taken up	
6	LILO of 400 KV Lko-Mbd at Bly.	22	84	0	0	NIL	Shall be taken up after receiving Insulators under PCK-C	
7	400 KV Bly-Mbd	108	756	0	0	NIL		
8	± 500 KV HVDC Ballia-Bhiwadi Pole-I	400	1040	148	362	35	OCT 10	OCT 10
9	± 500 KV HVDC Ballia-Bhiwadi Pole-II	400	1040	148	362	35	OCT 10	OCT 10
Other lines where polymer insulators were provided								
1	400 KV S/C Allahabad-Kanpur-I	13	39	13	39	100		
2	400 KV S/C Allahabad-Kanpur-II	13	39	13	39	100		
	TOTAL FOR AC LINES:	**5798.5**	**33236**	**4849**	**28290**			
	TOTAL FOR DC LINES	**2570**	**6688**	**1494**	**3860**			
	TOTAL FOR AC & DC LINES	**8369**	**39924**	**6343**	**32150**			
NRTS-II								
Sl. No	**Name of line**	**Total Locations where polymer required to be replaced (No)/ km**	**Total Polymer Strings Required (No)**	**Location Replaced(No) / Km of line covered**	**Polymer Insulator strings replaced**	**% Complete**	**Schedule for replacement of balance**	
Phase-I (To be replaced Complete)								
1	**400 KV Bawana- Bahadurgarh Line**	**48.94**	**500**	**48.94**	**500**	100		
2	**220 KV Hisar- Hisar Link Line Ckt- I**	**13.77**	**193**	**13.77**	**193**	100		
3	**220 KV Hisar- Hisar Link Line Ckt- II**	**13.77**	**187**	**13.77**	**187**	100		
4	**400 KV Hisar- Bhiwani Line**	**35.33**	**387**	**35.33**	**387**	100		
5	**400 KV Bahadurgarh- Bhiwani line**	**84.37**	**839**	**84.37**	**839**	100		
6	**400 KV Hisar- Bawana line**	**131.85**	**1295**	**131.85**	**1295**	100		
7	**400 KV Hisar- Fatehabad Line**	**83.60**	**828**	**84.00**	**828**	100		
	Phase-I (Partial Replacement)							
8	400 KV Dadri- Malerkotla Line	193.48	716	24.50	716	100		
9	400 KV Moga- Fatehabad Line	183.99	615	30.00	615	100		
10	400 KV Moga- Hisar Line	209.17	655	36.00	655	100		
11	**400 KV Abdullapur- Bawana Line Ckt-I**	167.00	636	22.50	636	100		
12	**400 KV Abdullapur- Bawana Line Ckt-II**	167.00	635	22.50	635	100		
Phase-II (Partial Replacement)								
8a	400 KV Dadri- Malerkotla Line		264	24.50	20	8		
9a	400 KV Moga- Fatehabad Line		528	30.00	0	0		
10a	400 KV Moga- Hisar Line		761	36.00	0	0		
11a	400 KV Abdullapur- Bawana Line Ckt-I		202	22.50	0	0		
12a	400 KV Abdullapur- Bawana Line Ckt-II		202	22.50	0	0		
Phase-II (To be replaced Complete)								
13	400 KV Hisar- Patiala Line	128.17	650	64.09	13	2		
14	400 KV Hisar- Kaithal Line	113.12	480	56.56	13	3		

15	400 KV Kaithal- Nalagarh line	199.85	880	99.92	0	0		
16	400 KV Nalagarh- Patiala Line	93.39	460	46.70	0	0		
17	400 KV Jallandhar- Ludhiana Line	84.77	436	39.36	0	0		
18	400 KV Ludhiana- Malerkotla Line	35.74	220	20.31	0	0		
19	400 KV Nathpa Jhakri- Abdullapur Line Ckt- I	180.00	346	25.72	0	0		
20	400 KV Nathpa Jhakri- Abdullapur Line Ckt-II	180.00	347	25.80	0	0		
	Tr. Lines under O&M	**2347.28**	**13262**	**1061.48**	**7532**	57		
Phase-III (To be replaced Complete)								
21	400 KV Moga - Bhiwadi Line Ckt- I	350.00	3369	350.00	0	0		
22	400 KV Moga - Bhiwadi Line Ckt- II	350.00	3369	350.00	0	0		
	Total	**3047.28**	**20000.00**	**1761.48**	**7532**	38		

Stage -II- New Lines identified for replacement of insulators

NRTS-I

Sl. No.	Name of the line	Total length (Kms)	Length covered in phase-I, II & III (Kms)	Length now proposed (Kms)	Portion now selected	Portion covered after proposed augmentation work	Total insulator strings required	remarks
1	400 KV Mainpuri-Ballabgarh-I	236	142	94	Remaining	Full	1509	
2	400 KV Mainpuri-Ballabgarh-II	236	142	94	Remaining	Full	1509	
3	400 KV S/C Kanpur-Ballabgarh	386	232	154	Remaining	Full	2373	
4	400 KV S/C Hissar-Bassi	277	166	111	Remaining	Full	2748	
5	400 KV D/C LILO of Hissar-Bassi at Bhiwadi	76	22.5	53.5	Remaining	Full	1836	
6	± 500 KV HVDC Rihand - Dadri Pole-I	815	354	461	Remaining	Full	6540	
7	± 500 KV HVDC Rihand - Dadri Pole-II	815	354	461	Remaining	Full	6540	
8	400 KV S/C Agra-Ballabgarh	181	109	72	Remaining	Full	1276	
9	400 KV S/C Bhiwadi-Bassi-I	235	141	94	Remaining	Full	1236	
10	400 KV S/C Allahabad-Kanpur-I	225	0	225	Remaining	Full	2448	
11	400 KV S/C Allahabad-Kanpur-II	224	0	224	Remaining	Full	2580	
12	400 KV Singrauli-Kanpur	398	0	398	Partial	Partial	1275	
13	220 KV FGPP-Palla-I & II	16	8	8	Full	Full	99	
14	220 KV FGPP-Samaipur-I & II	18	9	9	Full	Full	96	
15	220 KV Kanpur-Naubasta (Up to LILO point)	14.86	0	14.86	Full	Full	486	
16	220 KV Kanpur-Mainpuri (up to LILO point)	10.4	0	10.4	Full	Full	249	
17	220 KV Kanpur-Unchahar (I)	224	0	224	Partial	Partial	270	
18	220 KV Kanpur-Unchahar (II)	224	0	224	Partial	Partial	270	
19	220 KV Kanpur-Unchahar (III)	224	0	224	Partial	Partial	270	
20	220 KV Kanpur-Unchahar (IV)	224	0	224	Partial	Partial	270	
21	400 kV Agra-Bhiwadi -I & II	209	75	134	Remaining			

22	400 kV Kanpur-Ballabhgarh-II & III	378	0	378	Full		
TOTAL				**3892**			
	Total						

NRTS-II

S. No.	Name of line	Line Length in Kms.	length covered in phase-I, II & III in Kms	Length now proposed	Portion now selected	Portion now selected	Total insulator strings required	Remarks
1	400 KV S/C Dadri-Malerkotla	299	189	110	Remaining	Remaining	1482	
2	400 KV D/C Abdullapur-Bawana-I	167	83	84	Remaining	Remaining	1433	
3	400 KV D/C Abdullapur-Bawana-II	167	83	84	Remaining	Remaining	1434	
4	400 KV D/C Hisar-Fatehabad-Moga	209	82	127	Remaining	Remaining	1404	
5	400 KV Hisar- Patiala Line	179	111	68	Remaining	Remaining	2008	
6	400 KV Hisar- Kaithal Line	114	65	49	Remaining	Remaining	694	
7	400 KV Nalagarh- Patiala Line	94	0	94	Full	Full	2220	
8	400 KV Nalagarh -Kaithal line	200	41	159	Remaining	Remaining	2738	
9	400kV S/C Jallandhar -Amritsar	60	0	60	Full	Full	986	
10	400 KV Jallandhar- Ludhiana Line	85	55	30	Remaining	Remaining	513	
11	400 KV Ludhiana- Malerkotla Line	36	15	21	Remaining	Remaining	227	
12	400 KV Patiala - Malerkotla Line	63	0	63	Full	Full	867	
13	220kV D/C Jallandhur -Himrpur	122	0	30	Partial	Partial	900	
14	400 KV D/C Kaithal - Meerut Line	163.7	0	163.7	Full	Full	8820	
	Total			1142.7			**25726**	

Annex-VI

UPPTCL: Lines covered under Stage-I status of 10-11-2009

Sl. No.	Name of Line	Strings required (No.)	Strings Changed (No.)	Towers on Which Changed (No.)	Locations where Strings Changed	Completion (%)	Remarks
1	400 kV Muradnagar-Muzaffarnagar	105	36	12	NA	34	
2	400 kV Muradnagar-Panki	441	80	NA	NA	18	
3	220 kV Muradnagar-Shamli	345	234	78	81 to 147	68	
4	220 kV Muradnagar-Khurja	210	102	31	304 to 342	49	
5	220 kV Muradnagar-Sahibabad	210	102	31	304 to 342	49	
6	220 kV Muradnagar-Interconnector I&II	24	24	7		100	
7	220 kV Sahibabad-Muradnagar Ckt-II	600	215	37	17 to 25, 31 to 47, 59, 69, 62 to	36	
8	220 kV Modipuram-Matore Ckt-I	33	33	11		100	
9	220 kV Modipuram-Matore Ckt-II	9				0	
10	220 kV NAPP-Khurja	285	69	12	9,11,13,30, 31,32,58,59 ,60,61,62,6	24	
11	220 kV Muradnagar-Modipuram	135				0	
12	220 kV Baraut-Muradnagar	105				0	
13	220 kV Baraut-Shamli						
14	220 kV Shatabdinagar-Matore	153				0	
15	220 kV Shatabdinagar-Modipuram						
16	220 kV Greater Noida-Noida Ckt-II	132	132	44		100	
	Total	2787	1027	263		37	

Annex-VII

BBMB- Lines under Stage-I

s.no	Name of line, voltage,S/C or D/C	Line Length			Length where insulators to be replaced							%age-wise work completed in Kms	%age-wise work completed in Location	Remarks
		Kms	No. of locations	Total Insulator Strings (Nos)	Kms	No. of locations	Total Insulator Strings required (Nos)	No of locations	Insulator Strings replaced (Nos)	Schedule for replacement of balance				
										Start Date	End Date			
1	400KV S/C Dehar-Panipat Line	261.8	772	4314	…	206	771	..	..	…	..	..	..	
2	400KV S/C Dehar-Bhiwani Line	312.15	943	4791	..	331	1245	..	..	…	..	..	..	
3	220KV Rohtak Road-Narela ckt-I	22	81	426	…	81	426	..	..	…	..	..	..	
4	220KV Rohtak Road-Narela ckt-II	22	81	426	..	81	426	..	..	…	..	..	..	
5	220KV Panipat-Narela ckt-I	56.8	197	811	..	73	263	..	..	…	..	..	..	
6	220KV Panipat-Narela ckt-II	56.8	197	811	..	73	263	..	..	…	..	..	..	
7	220KV Panipat-Narela ckt-III	58	171	588	..	81	273	..	..	…	..	..	..	
8	220KV Ballabhgarh-BTPS-I	24.73	90	321	24.73	90	321							
9	220KV Ballabhgarh-BTPS-II	24.73	90	321	24.73	90	321							
10	220KV Samaypur-Ch. Dadri S/C	118	400	1323	118	154	518							
11	220KV Ballabhgarh-Ch. Dadri S/C	119.7	407	1378	119.7	169	569							
12	220KV Ballabhgarh-Samaypur-I	4.23	20	84	4.23	20	84							
13	220KV Ballabhgarh-Samaypur-II	4.23	20	84	4.23	20	84							
14	220KV Ballabhgarh-Samaypur-III	5.5	23	87	5.5	15	51							

(B)	Antifog insulators												
Name of the organization: Bhakra Beas Management Board									Status as on: 08.03.2010				
Line Code	Name of line, voltage,S/C or D/C	Line Length			Length where insulators to be replaced						%age-wise work completed in Kms	%age-wise work completed in Location	Remarks
		Kms	No. of locations	Total Insulator Strings (Nos)	Kms	No. of locations	Total Insulator Strings required (Nos)	No. of locations	Insulator Strings replaced (Nos)	Schedule for replacement of balance			
										Start Date	End Date		
	220KV Dhulkot-Panipat ckt-I	130	433	1669	..	29	117	29	117	..	…	..	100%	Detail of length in Kms can not be worked out due to different locations.
	220KV Dhulkot-Panipat ckt-II	130	433	1669	..	29	117	29	117	..	…	..	100%	
	220KV S/C Panipat-Ch. Dadri Line	115	342	1173	..	21	81	21	81	..	..	..	100%	
	220KV S/C Kurukshetra-Panipat Line	77.08	233	786	..	28	105	28	105			..	100%	
	220KV BUSES at 400KV S/S Panipat	…	…	240		…	240	…	240			..	100%	
	220KV Bhakra-Jamalpur ckt -I	86.4	1-276	1034	11	32	204	31	198			96%	97%	Disc of T. No. 276 could not be replaced due to 120KN 16/32 mm antifog disc received from Bhiwani are poor quality
	220KV Bhakra-Jamalpur ckt - II	86.4	1-276	1034	11	32	204	31	198			96%	97%	
	220KV Jamalpur-Jallandhar ckt-I	64	1-214	960	9	27	87	27	87	..	…	100%	100%	
	220KV Jamalpur-Jallandhar ckt- II	64	1-214	960	9	27	87	27	87	..	..	100%	100%	
	220KV Pong-Jalandhar ckt- I	97.5	1-328	1204	4	12	36	12	36			100%	100%	
	220KV Pong-Jalandhar ckt- II	97.5	1-328	1204	4	12	36	12	36			100%	100%	
	220KV Jamalpur-Sangrur ckt- I	78	1-268	970	15	40	313	39	307			98%	98%	Disc of T. No. 89 could not be replaced due to 120KN 16/32 mm antifog disc received from Bhiwani are poor quality
	220KV Jamalpur-Sangrur ckt- II	78	1-268	970	15	40	313	39	307			98%	98%	
	220KV Hisar-Sangrur-I	139	477	1431	139	62	186	62	186			100%	100%	Standing of water & crops in fields
	220KV Hisar-Sangrur-II	139	477	1431	139	62	186	62	186			100%	100%	
	220KV Bhiwani-Hisar-I	57.95	199	654	30	102	345	85	255	21.04.2010	21.04.2010	74%	83%	Standing of water & crops in fields
	220KV Bhiwani-Hisar-II	57.95	199	654	30	102	345	84	252	24.04.2010	24.04.2010	73%	82%	
	220KV Bhiwani-Ch. Dadri-I	36.45	124	420	7.6	26	81	25	75	09.03.2010	09.03.2010	96%	96%	Standing of water & crops in fields
	220KV Bhiwani-Ch. Dadri-II	36.45	124	420	7.6	26	81	26	78	11.03.2010	11.03.2010	98%	98%	Standing of water & crops in fields
	220KV Bhiwani-Ch. Dadri-III	34.7	127	444	9.5	35	114	35	114			100%	100%	
	220KV Bhiwani-Ch. Dadri-IV	34.7	127	444	9.5	35	114	35	114			100%	100%	