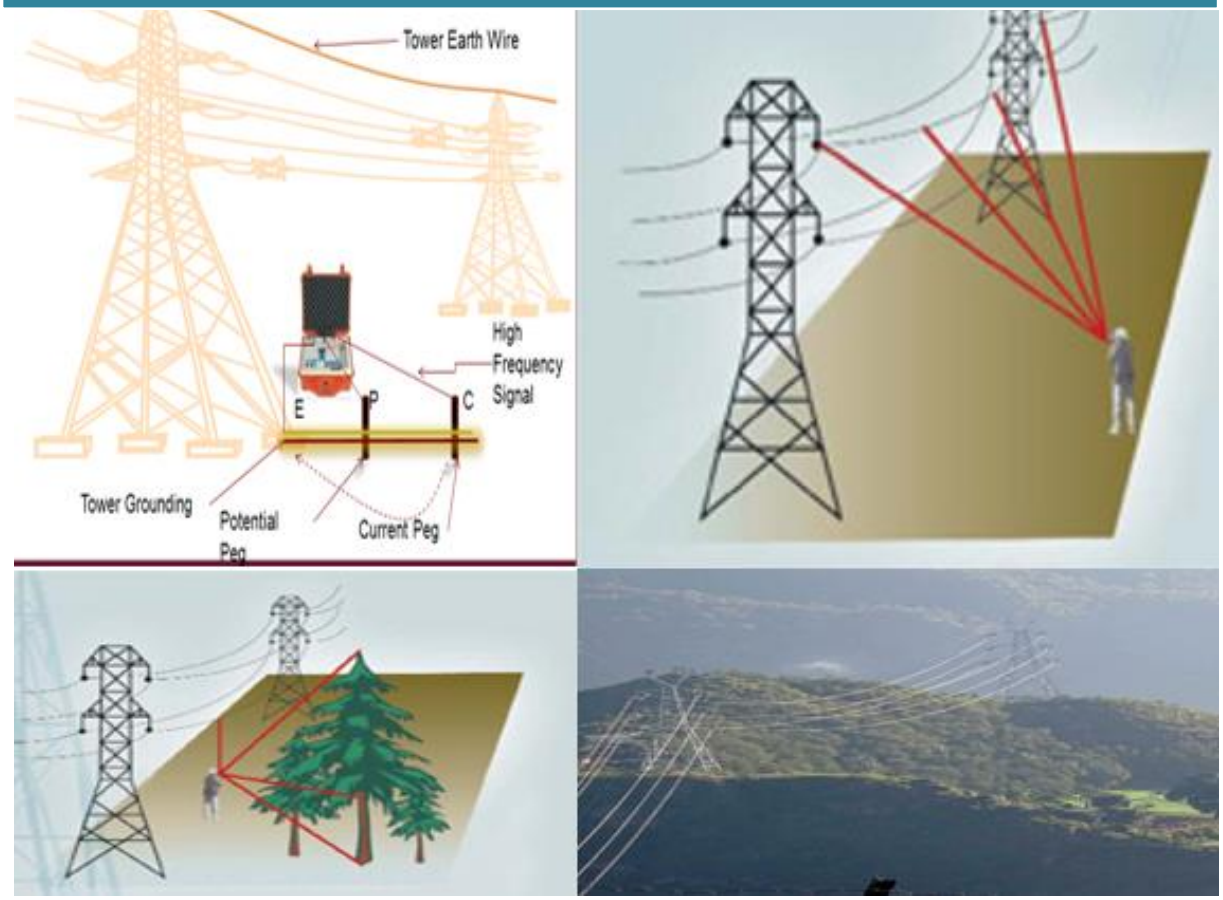
PRE-COMMISSIONING FORMATS FOR TRANSMISSION LINE



पावरग्रिड
POWERGRID

CORPORATE ASSET MANAGEMENT
POWER GRID CORPORATION OF INDIA LTD.

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PRE COMMISSIONING FORMATS FOR TRANSMISSION LINES	Earlier Doc. No. D-2-01-70-01-02 Present Doc. No. D-2-01-70-01-03-part B				
	Rev.	Dept.	Date	Signature	Signature
	00	CC(OS)	30/11/1995	Sd/-	Sd/-
	01	CC(OS)	28/06/2004	Sd/-	Sd/-
	02	CC(AM)	15/12/2014	Sd/-	Sd/-
	03	CC(AM)	07/09/2021		

Proposed by	Reviewed by	Recommended by	Approved by
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Vivek Sundariyal CM (AM)			

Sl. No.	Chapter	Revision	Action
1	All	01	Replace All
2	All	02	Replace All
3	All	03	Replace All

Index

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ABBREVIATIONS

AC	Alternating Current
AM	Asset Management
CC	Corporate Centre
CEA	Central electricity authority
CLR insulator	Composite Long Rod Insulator
CTUIL	Central Transmission Utility of India Limited
CVT	Capacitive Voltage Transformer
DC	Direct Current
D/C	Double circuit
FR type Foundation	Fissured rock type foundation
FS type Foundation	Fully submerged type foundation
GS	Ground Switch
HR type Foundation	Hard Rock type foundation
HVDC	High voltage Direct Current
ICT	Inter Connecting Transformer
IS	Indian standard
MOEF	Ministry of Environment and Forest
M/C	Multi circuit
NH	National Highway
NTAMC	National Transmission Asset Management System
OPGW	Optical Fiber Ground wire
PS type Foundation	Partially submerged type foundation
PTCC	Power and tele-communication coordination committee
PTW	Permit to work
ROW	Right of way
S/C	Single circuit
WBC type Foundation	Wet black cotton type foundation

Introduction:

The document consists of 4 formats.

Format 1: This format is divided into two parts. Part 1 covers the general information of Line, in part2 details inspection checklist need to be filled against each tower location.

Format 2: In this format list of pending works in the line, list of temporary arrangement used during line construction, removal of any antitheft measure used before energization of line will be filled and same will be verified in handing over format (**Format 3**)

Format 3: In this format handing over of the records related to statutory clearance documents, **Format -1** and **Format-2** will be done by construction team to the commissioning team and same will be recorded in this format with acceptance of energization of line by the commissioning in charge. The pending work (minor nature type) which will not potentially affect the charging of line will be listed in the format.

Format 4: Carrying out Electrical tests before energization of Line and recording of all electrical parameter such as voltage, current, active Power, reactive power, phase sequence etc. after energization of the line need to be done as per this format and record will be kept for future use.

Table for different type of clearances have given before each format for user reference purpose based on the present version of technical specification of POWERGRID.

FORMAT NO: AM/COMM/LINE/1a

Name of line	No of Circuit	Date of Energization

GERERAL DATA AND INFORMATION (for Line)

I	Region Name									
II	TL Office Name									
III	Type Of Conductor	Dog	Panther	Zebra	Moose	Snow Bird	AL 59	Bersimis	Lapwing	Others
IV	No of conductors in bundle	Single	Twin	Triple	Quad	Hexa	Octa	Others		
V	Voltage rating(kV)	66	132	220	+/-320	400	+/-500	+/- 800	765	1200
VI	Type of circuit	S/C	D/C	S/C on D/C Tower	M/C					
VII	Length of Line(in kms) **for the jurisdiction**									
VIII	Total Nos. of Towers **(in the jurisdiction)**									
a.	Total no of suspension towers									
b.	Total no of tension towers									

Note: Every row fields are independent and the verifying officer will tick the field as applicable for each location in other type of conductor HTLS or any other type to be mentioned

IX CROSSING DETAILS

a) River crossing

Span(Loc A-Loc B)	River(Name)	Whether River is navigable or not

b) Railway crossing

Span(Loc A-Loc B)	Name of Railway line

c) NH crossing

Span(Loc A-Loc B)	Name of NH

d) Power line crossing

Span (Loc A-Loc B)	Name of Power Line	Voltage rating of line (in kV)

FORMAT NO: AM/COMM/LINE/1b

GERERAL DATA AND INFORMATION (To be furnished against each Location)

Tower Location No:											
I	**Insulator Type**	Porcelain		CLR		Glass		Porcelain Long Rod		Mixed	
II	**Tower type details**										
	Tower type (For S/C)	A	B	B1	B2	C	C1	C2	D	D45	D60
	Tower type (For D/C)	DA	DB	DB1	DB2	DC	DC1	DC2	DD	DD45	DD60
	Angle of Deviation of Tower	0-2	2-15	2-7	7-15	15-30	15-22	22-30	30-60	30-45	45-60
	Tower type (For M/C) with angle of deviation	QA (0-2)	QB (2-15)			QC (15-30)			QD (30-60)		
III	**Normal Extn. (Meters)**	+3		+6		+9		+18		+25	+30
IV	**Other Leg/BodyExtn. (Meters)**	+1.5		+3.0		+4.5		+6.0		+7.5	+9.0
		-1.5		-3.0		-4.5		-6.0			
V	**Tower Foundation Type**	Dry	Sandy Dry	Wet	Wet cultivated	PS	FS	WBC FR	FR	HR	PILE
VI	**Is the location Vulnerable**	Yes					No				

Note: Every row fields are independent and the verifying officer will tick the field as applicable for each location

VII DETAILED CHECK LIST (To be furnished against locations)

Tower location No:

SL NO	DESCRIPTION	STATUS		REMARKS Record Deficiencies If Any
		YES	NO	
1	**Foundation**			
a	Check any damage/ uneven settlement of foundation			
b	Check back filling of foundation is properly filled up to the ground level of all legs			
c	Check surface earth/ concrete after foundation casting is removed from platform of the tower			
d	Check crack or damage to chimney			
e	Check crack or damage to retaining wall/ revetment and proper weep holes are provided for flushing water			
f	Check that all foundation chimneys are covered with soil and compacted specially in hilly terrain and river/ nalas banks up to ground level			
g	Check cliff-in foundation levels are within limit			
h	Check the back to back, diagonal and level of all four stubs (to be measured at stub top level). **Refer format-A for filling**.			
2	**Tower**			
a	Check for deformed/ rusted or damaged tower members			
b	Check for missing/hanging/bent tower members			
c	Check for missing bolts & nuts			
d	Check for tightening of all bolts & nuts			
e	Check for any missing joint plates			
f	Check for punching, tack welding (at least 10 mm circular length) and zinc coating of bolts & nuts			
g	Check filling of extra holes in tower members with bolts & nuts			
h	Check verticality of tower			

SL NO	DESCRIPTION	STATUS		REMARKS Record Deficiencies If Any
		YES	NO	
i	Check that no tower leg is suspected to be in sinking land or soil erosion field of river bank, if so, proper adequate protection has been provided			
J	Check fixing & visibility of all tower accessories namely danger/ number/ circuit/ phase plate/ step bolts and anti-climbing device (ACD)			
k	Check correct sequence of fixing of phase/ circuit plate at transposition towers			
l	Check that Fixing of bird-guards is done for all suspension towers to prevent birds perching			
m	Geotagged digital photographs (from different angles) of all towers to be taken and preserved.			
3	**Removal of T&P and foreign materials**			
a	Check temporary Earthing/ Guys used during stringing and jumpering are removed			
b	Check all foreign materials on tower e.g., discharge rod, wire/ropes, kite, bird nests and any other T&P etc. left over on tower/ cross arm are removed			
c	Check that all the insulator discs/ Long rod insulator units are free from any damage			
d	Check for unusual deflection in suspension strings and if found, should be rectified			
e	Check proper aviation warning signals on towers above 45 meter height			
f	Check that red & white paints have been applied on towers which fall in aviation route			
4	**Hardware fittings**			
a	Check that proper fixing of hardware fittings like corona control ring/ grading ring/ arcing horns/ etc. are provided as per the approved drawing/ specification			
b	Check the condition of cotter pins and ensure that proper size cotter pins have provided as per the approved drawing.			
c	Check that all insulators are thoroughly clean			

SL NO	DESCRIPTION	STATUS		REMARKS Record Deficiencies If Any
		YES	NO	
5	**Conductor and its accessories**			
a	Check that the conductors/ sub-conductors are free from scratches/ rubs			
b	Check that all joints on conductor/ earth wire/OPGW are away from the tower as per the specified distance (at least 30 meters) and joints are as per the approved drawings/ specification			
c	Check that not more than one joint in a sub conductor is provided in one span.			
d	Check that no mid span joints or repair sleeves are provided in major crossings for highway, Railway and major rivers.			
e	Check that all mid span joints on conductors/ Earth wire/OPGW and repair sleeves of compression type are free from sharp edges rust and dust			
f	Check that conductor is properly clipped in the suspension clamp			
g	Check that armor rods are provided on suspension towers			
h	Check that spacers/ spacer dampers are provided between sub conductors on each phase as per approved spacer placement chart/ specification			
i	Check that in case of tension towers, one additional spacer/ spacer damper is placed within 10 meter of dead end clamp.			
j	Check that all the spacers/ spacer-dampers are properly tightened and free from any external damage.			
k	Check that spacing of vibration dampers from the tower and spacing between damper to damper where two vibration dampers provided are properly fixed and tightened as per the damper placement chart/ specification			
l	Check that all the jumpers are properly fixed and torque tightened as per the approved drawing/ specification			

SL NO	DESCRIPTION	STATUS		REMARKS Record Deficiencies If Any
		YES	NO	
m	Check that on conductors/ earth wires/OPGW hardware fittings are free from all foreign material like dead bird/ fallen tree/ bird nests etc.			
n	Check that suitable counter weight is provided on Pilot string insulator (CLR type) as per approved drawings			
0	Check that Counter weight is provided for pilot insulator string in case of transposition tower (for both disc type/CLR type string)			
p	Geotagged digital Photographs indicating all jumper bolts are provided and properly tightened for at least 10% jumper connections are taken on random basis and preserved			
6	**Different type of Clearances**			
a	Check that right of way is not obstructed by any building/hut etc. The vertical clearance and horizontal clearance need to be maintained (if present/applicable) **(Refer Table-1 and 2)**			
b	Check that minimum clearance with trees is maintained if Trees are present in the corridor**(Refer Table-3)**			
c	Check that mid span clearance between top conductor and earth wire/ OPGW is adequate **(Refer Table-4)**			
d	Check that clearance between lowest conductor and ground is more than the required minimum ground clearance **(Refer Table-5)**			
e	Check that Jumper drop (i.e. distance between cross-arm and null point of jumper) as per design/drawing. All jumpers shall be checked for proper tightening. **(Refer Table-6)**			
f	Check that minimum clearance at Power line crossing is maintained. (if applicable) **(Refer Table-7)**			

SL NO	DESCRIPTION	STATUS		REMARKS Record Deficiencies If Any
		YES	NO	
g	Check that minimum clearance at railway track crossing is maintained (if applicable). **(Refer Table-8)**			
h	Check that minimum clearance at NH crossing is maintained. **(Refer Table-9)**			
i	Check that minimum clearance at River crossing is maintained (if applicable). **(Refer Table-10)**			
j	Measure the sag in one of the span in each section and check that sag and tension of the section is in line with specification and sag & tension calculation chart is approved by Engg. **Refer Format-B for measurement of Sag**			
7	**Tower footing impedance**			
a	Tower footing impedance needs to be measured at each location and it is to be ensured that impedance value is less than 10 ohms **Refer Format-C for measurement of Tower footing impedance**			
b	Physically check that earthing is at healthy condition (i.e. not damaged/not loose/not open)			
	10% checking			

Format-A for checking Back to Back measurement of stub

	As per drawing	Measured value	Deviation
Leg A-Leg B			
Leg B-Leg C			
Leg C-Leg D			
Leg D-Leg A			
Leg A-Leg C			
Leg B-Leg D			

Table-1: Clearance for right of way at different voltage level

Transmission voltage (kV)	66	132	220	± 320 HVDC	400 (S/C)	400 (D/C)	± 500 HVDC	± 800 HVDC	765(S/C) *(H/D type)	765 (D/C)	1200 (S/C)
ROW width (Meters)	18	27	35	44	52	46	52	69	85/ 64	67	89

* H-Horizontal configuration
D-Delta configuration
Formats for record

Location No	
ROW width (Meters)	

Table-2: Clearances from buildings of Lines

a) Vertical clearance

Voltage (kV)	66	132	220	400	765	1200
Minimum clearance (mm)	4000	4600	5500	7300	10600	14500

b) The horizontal clearance

Voltage (kV)	66	132	220	400	765	1200
Minimum clearance (mm)	2300	2900	3800	5600	8900	12800

Note: Clearance are calculated as per norms specified in clause no 61 of CEA safety regulation 2010

c) Clearance for DC line

Sl. No	DC Voltage (kV)	Vertical Clearance (in mm)	Horizontal Clearance (in mm)
1.	100 kV	4600	2900
2.	200 kV	5800	4100
3.	300 kV	7000	5300
4.	400 kV	7900	6200
5.	500 kV	9100	7400
6.	600 kV	10300	8600
7.	800 kV	12400	10700

Formats for record (if applicable)

Building /Structure	HCL	VCL
Clearance from building		

Table will be repeated for more than structure present

Table-3 : Minimum electrical clearance between Conductor & Trees

Voltage (KV)	Minimum clearance between conductors and trees (in meter)
66	3.4
132	4.0
220	4.6
400	5.5
765	9.0
+/-500 HVDC	7.4
+/-800 HVDC	10.7
1200	13

Formats for record (if applicable)

Tree	
Clearance from line	

Table repeated for more than one tree in corridor

Table-4: Minimum clearance for top conductor and Earth wire at mid-span

Voltage (kV)	66	132	220	± 320 HVDC	400	765	± 500 HVDC	± 800 HVDC	1200
Minimum mid span clearance (mm)	3000	6100	8500	9000	9000	9000	8500	12000(pole) 6100(DMR)	18000

Formats for record

Location	
Mid span Clearance value	

Table will be repeated if more than circuit is present in the line

Table-5: Minimum ground clearance for different voltage level

Transmission voltage kV)	**66**	**132**	**220**	**± 320 HVDC**	**400**	**765**	**± 500 HVDC**	**± 800 HVDC**	**1200**
Minimum Ground Clearance (mm)	5500	6100	7015	8500	8840	18000	12500	18000	24000

Formats for record

Location	
Minimum Ground Clearance (mm)	

Table will be repeated if more than circuit is present in the line

Table-6: Table for Jumper Drop

Transmission voltage kV)	**66**	**132**	**220**	**400**	**765**	**± 500 HVDC**	**± 800 HVDC**
Jumper Drop (in meter)	**1.3**	1.8	2.4	3.6	6.1	4	7.8(pole) 2.6(DMR)

***values to be confirmed with respective drawings**

Formats for record

Span (Tower location nos.)		**Jumper drop for Circuit-I**		
		R	**Y**	**B**

Table will be repeated for other circuit too in case of D/C or M/C

Table 7: Measurement of minimum clearance when line is crossing another Power line

Sl No	**Nominal System Voltage (in kV)**	**132**	**220**	**400**	**+/- 500 HVDC**	**765 kV**	**+/- 800 kV HVDC**	**1200**
1.	**132KV**	3050	4580	5490	6860	7940	9040	1044
2.	**220KV**	4580	4580	5490	6860	7940	9040	1044
3.	**400KV**	5490	5490	5490	6860	7940	9040	1044
4.	**+/- 500 kV HVDC**	6860	6860	6860	6860	7940	9040	1044
5.	**765 kV**	7940	7940	7940	7940	7940	9040	1044
6.	**+/- 800 kV HVDC**	9040	9040	9040	9040	9040	9040	1044

7.	**1200 kV**	1044	1044	1044	1044	1044	1044	1044

Formats for record (if applicable)

Span (Tower location nos.)		Crossing Power line details (Name & voltage)	Clearance (mm)

Table 8: Measurement of minimum clearance when line is crossing Railway track

(i) Vertical clearance for OHE (other than high rise OHE):

Sl. No.	Transmission line voltage level	Minimum clearances from Rail Level
		New Power Line crossing or crossing planned for alteration
1	Above 66 kV & up to 132 kV	15.56 m
2	Above 132 kV & up to 220 kV	16.46 m
3	Above 220 kV & up to 400 kV	18.26 m
4	Above 400 kV & up to 500 kV	19.16 m
5	Above 500 kV & up to 800 kV	21.86 m

(ii) Vertical clearance for high rise OHE*:

Sl. No.	Transmission line voltage level	Minimum clearances from Rail Level
		New Power Line crossing or crossing planned for alteration
1	Above 66 kV & up to 132 kV	17.56 m
2	Above 132 kV & up to 220 kV	18.46 m
3	Above 220 kV & up to 400 kV	20.26 m
4	Above 400 kV & up to 500 kV	21.16 m
5	Above 500 kV & up to 800 kV	23.86 m

* Applicable only for electrification of routes where double stack container having maximum height of 6809 mm is plying

(iii) Minimum Clearances between Highest Traction Conductor & Lowest Crossing conductors

Sl. No.	Transmission line voltage level	Minimum clearances from Rail Level
		New Power Line crossing or crossing planned for alteration
1	Above 66 kV & up to 132 kV	3.05
2	Above 132 kV & up to 220 kV	4.58
3	Above 220 kV & up to 400 kV	5.49
4	Above 400 kV & up to 500 kV	7.94

5	Above 500 kV & up to 800 kV	7.94

Notwithstanding the above ,Minimum clearance for railway crossings shall be as per Indian Railway Schedule of dimensions(BG) Revised 2004 as amended from time to time.

Formats for record (if applicable)

Span (Tower location nos.)	Railway track details (Name & voltage)	**Vertical clearance for OHE**	**Vertical clearance for high rise OHE**	**Minimum Clearances between Highest Traction Conductor & Lowest Crossing conductors**

Note: Minimum clearance when power line crossing railway track:

Table-9: Minimum Clearance in air above ground and across road surface of Highways or roads for lowest conductor of overhead lines

A) AC system

Nominal system Voltage(in kV)	**Clearance above ground**			**Clearance between conductor & road surface across high way(in meter)**
	Across street (in meter)	**Along street (in meter)**	**Elsewhere) (in meter)**	
66	6.5	6.1	5.5	11.6 or U/G cable
132	6.5	6.1	6.1	11.6
220	7.02	7.02	7.02	12.52
400	8.84	8.84	8.84	14.0
765	18*	18*	18*	18.8
1200	24*	24*	24*	30

B) DC system

Nominal system Voltage(in kV)	**Clearance above ground**	**Clearance between conductor & road surface across high way(in meter)**
+/- 500 kV HVDC	12.5	17.25
+/- 800 kV HVDC	18	22.75

Formats for record (if applicable)

Span (Tower location nos.)	Name of NH	Clearances	
		Clearance above Ground	Clearance between conductor & road surface across high way(in meter)

Table-10: Minimum Clearance of Power Conductor over the Highest Flood Level in case of navigable/non navigable rivers

AC system

AC Voltage Level in kV (Nominal voltage)	Minimum Clearance above H.F.L (mm)	
	Navigable River	Non-navigable river
66	19000	3650
110	19000	4300
132	19220	4300
220	20100	5100
400	21900	6400
765	25550	9400
1200	29900	11000

DC system

DC Voltage in kV	Minimum Clearance above H.F.L (mm)	
	Navigable River	Non-navigable river
+/- 500	24030	6750
+/- 800	27700	11000

Formats for record (if applicable)

Span (Tower location nos.)	Name of river (navigable/non-navigable)	Clearances	
		Clearance above Ground	Clearance between conductor & road surface across high way(in meter)

Format-B for measurement of sag in one of the span in each section (as applicable)

Section (Loc A To Loc B)	Span (Loc C To Loc D)	Measured sag(in meter)

Note: Measurement to be repeated for each phases and circuits

Format-C for measurement of Tower footing impedance

Location No.	Leg No	R(in Ω)	Rc (in Ω)	C (in nF)	L (in µH)	Z (in Ω)
	Leg-A					
	Leg-B					
	Leg-C					
	Leg-D					

(Note: The value should not be more than 10 ohms)

The above inspection and measurements are carried out in the location mentioned above and the remaining activities, temporary arrangements etc. are documented in format no: **AM/COMM/LINE/2**

	Erection Agency Representative	**Supplier Agency Representative**	**Project Execution (POWERGRID)**
Signature			
Date			
Name			
Organization			

Note:

- This format is to be filled for each tower location.
- This format is to be kept at group head quarter with a copy to regional head quarter
- This format to be signed not below the level of engineer and important locations like river crossing, railway crossing, National Highway, power line crossing etc. are to be countersigned by minimum Manager for POWERGRID and in-charge of the working agency

FORMAT NO: AM/COMM/LINE/2

NAME OF LINE	CIRCUIT	DATE OF ENERGISATION

INSPECTION RECORD PRIOR TO HANDING OVER FOR ENERGIZATION

LIST OF REMAINING ACTIVITIES

LIST OF TEMPORARY ARRANGEMENTS

Region:			Location		Observation		Completion		Inspection	
Section A/B/C	Sl. No.	Tower No.	From	To	Date	Sign	Date	Sign	Date	Sign
			Description of remaining activities/ Temporary arrangements							

	Erection Agency representative	Erection (POWERGRID)	Line In-charge (POWERGRID)
Signature			
Date			
Name			
Organization			

Details of sections is to be furnished in this format:

a. Outstanding activities remaining in any part of the line
b. A list of temporary arrangements introduced.
c. Checklist records properly completed and signed as per format **AM/COMM/ LINE/ 1**
d. Original tracing of Profile, Route alignment, Tower Design, Structural Drawings, Bill of material, Shop drawings, Stringing Charts indicating initial and final sag etc. of all towers submitted to POWERGRID.

Note: This document is to be retained at Group head S/S or TLM office with a copy RHQ

FORMAT NO: AM/COMM/LINE/3

NAME OF LINE	CIRCUIT	DATE OF ENERGISATION

HANDING OVER RECORD FOR ENERGIZATION

A. **GENERAL DATA AND INFORMATION**:

REGION		Office		TYPE OF TOWERS		S/C	D/C	M/C
VOLTAGE RATING			KV	Tower locations	From		To	
Total no. of towers				Total length			Kms.	

Details:

SL NO	DESCRIPTION	STATUS		REMARKS Record Deficiencies If Any
		YES	NO	
1	Check list of entire section of the line along with towers and accessories under this Division have carried out and documented in the format no: **AM/COMM/LINE/1**			
2	Inspection has been carried out in all towers and the outstanding issues along with temporary arrangements are documented in the format no: **AM/COMM/LINE/ 2**			
3	No. of remaining activities/ points are listed at **clause-B** in this format these are minor in nature and do not stop charging the line			
4	All Electrical and Ground clearances are as per the Approved drawings issued from CC/ Engg. Dept have been checked and no deviation has been noted.			
5	All man and material and temporary antitheft electrical connection, if any, have been removed from all the locations under this Division .			
6	All electrical clearance has been received from CEA electrical inspector for charging of the line vide order no: Dated: **(copy enclosed)**			

SL NO	DESCRIPTION	STATUS		REMARKS Record Deficiencies If Any
		YES	NO	
7	PTCC clearance has been received from CEA's PTCC Directorate for charging of the line vide order no: Dated: **(copy enclosed)**			
8	All statutory rules and regulations pertaining to line charging has been carried out and Nothing is pending			
9	All working agencies involved In construction/ erection of this Line are intimated regarding charging of this line and further work, if any, are to be carried out only after availing the Permit to Work (PTW) from the Concerned sub-station operating staff			

B. HANDING OVER CHECK POINTS(Minor nature)

SECTION	Points according to format no: AM/COMM/LINE/1 (Nos of remaining activities)	Points completed and confirmed		Points accepted	
		Date	Sign	Date	Sign
A					
SECTION	**Points according to format no:** AM/COMM/LINE/1 **(Nos of remaining activities)**	**Points completed and confirmed**		**Points accepted**	
		Date	**Sign**	**Date**	**Sign**
B					
C					
D					

The above line is handed over for Energization with/ without remaining activities

	Handed over by	Accepted for Energization
Signature		
Date		
Name		
Designation	**Line In-charge**	**Commissioning In-charge**

Note: For details of section, please refer pre commissioning doc no : D-2-01-70-01-02, format no **AM/COMM/LINE/ 2**

FORMAT NO: AM/COMM/LINE/4

NAME OF LINE	CIRCUIT	DATE OF ENERGISATION

COMMISSIONING FORMAT

A. GENERAL DATA AND INFORMATION:

REGION		Office		TYPE OF TOWERS		S/C	D/C	M/C
VOLTAGE RATING			KV	Tower locations	From		To	
Total no. of towers				Total length			Kms.	

Details:

SL NO	DESCRIPTION	STATUS		REMARKS Record Deficiencies If Any
		YES	NO	
1	The entire section of the line handed over for energization as per POWERGRID format no: AM/COMM/LINE/3 on Dated:			
2	No. of remaining activities/ points are listed as per format no: AM/COMM/LINE/2 on and these are minor in nature and do not stop charging the line			
3	All the equipments involved in charging of the line are tested and documented as per the pre-commissioning formats of bay equipment			
4	Pre - commissioning tests of bay/ feeder as per approved document has been completed and test results are documented			
5	In case, reactor provided in this line, all tests are carried out as per prescribed format and all test results are documented			
6	All electrical clearance has been received from CEA electrical inspector for charging of the line vide order no: dated: (copy to be enclosed)			

SL NO	DESCRIPTION	STATUS		REMARKS Record Deficiencies If Any
		YES	NO	
7	All man and material and temporary antitheft electrical connection, if any, removed from all the locations			
8	All electrical clearance has been received from CEA electrical inspector for charging of the line terminating feeder vide order no : dated:			
9	PTCC clearance has been received from CEA's PTCC Directorate for charging of the line vide order no: Dated:			
10	All statutory rules and regulations pertaining to line charging has been carried out and nothing is pending			
11	All working agencies involved in construction/ erection of this line and sub-station Equipments are intimated regarding charging of this line & bay and further work, if any, are to be carried out only after availing the permit to work (PTW) from the concerned sub-station operating staff			
12	All the protections are checked and put into service as per standard format no: and documented			

B. MEASUREMENT INSULATION RESISTANCE FOR LINE (using 5 kV/ 10 kV motorized Insulation Tester):

BETWEEN	MEASURED VALUE IN M - OHM	REMARK	CONDITION
R-PHASE & GROUND			All ground switches at other end are opened. Min. value should be approx. 150 Mega ohm (value may change with weather condition)
Y-PHASE & GROUND			
B-PHASE & GROUND			
R-PHASE & Y-PHASE			
Y-PHASE & B-PHASE			
B-PHASE & R-PHASE			

C. CONTINUITY TEST OF THE LINE

a. For phase marking confirmation

Sending end Conditions	Receiving end Insulation Resistance between	Measured value In ohms	Remarks
CLOSE R - Phase GS &	R – Phase & Ground		Low
OPEN Y - Phase GS &	Y – Phase & Ground		High
OPEN B - Phase GS	B – Phase & Ground		High
OPEN R - Phase GS	R – Phase & Ground		High
CLOSE Y - Phase GS	Y – Phase & Ground		Low
OPEN B - Phase GS:	B – Phase & Ground		High
OPEN R - Phase GS	R – Phase & Ground		High
OPEN Y - Phase GS	Y – Phase & Ground		High
CLOSE B - Phase GS	B – Phase & Ground		Low
CONNECT R & Y Phase E, all GS open	R & Y-phase		Low
	Y & B-phase		High
	B & R-phase		High
Connect R & B Phase, all GS open	R & Y-phase		High
	Y & B-phase		High
	B & R-phase		Low
Connect Y & B Phase, all GS open	R & Y-phase		High
	Y & B-phase		Low
	B & R-phase		High

Note:
1. If the test values are as per the remarks, phase marking at both ends are correct.
2. This test is to be done if the IR value do not show short circuit of the line with ground or between phases in IR measurement

D. Verification/validation of phase sequence

After closing the breaker from one end only the line can be charged.

a Check the phase sequence by the phase sequence meter by connecting at the secondary of the CVT

OK	Not OK

b Check the phase sequence by the help of multi-meter in case of a charged sub-station at the secondary of the CVT (old & new) in the control panel as per the

measurement indicated below:

Sl. No.	Voltage measurement between		Measured voltage (volts)	Remarks
	New circuit	Charged old circuit		
1	R-phase	R-phase		In case of correct phase sequence, the voltage measured between R & R phase, Y & Y phase, B & B phase of old charged line and newly charged circuit will be zero or very small and all other measurements will show full line CVT phase to phase secondary voltage
2	R-phase	Y-phase		
3	R-phase	B-phase		
4	Y-phase	R-phase		
5	Y-phase	Y-phase		
6	Y-phase	B-phase		
7	B-phase	R-phase		
8	B-phase	Y-phase		
9	B-phase	B-phase		

F **CHARGING INSTRUCTION**

Once the correct phase sequence is established, the charging instruction received from CC-Engg. & CTUIL to be followed and properly documented regarding status of various parameters with other lines and generators **(if any)**

Charging instruction no: Dated: (**Copy enclosed**)

i. Charging details:

Date: Time:

ii **Pre-charging conditions for sending end**

a. Voltage ☐ kV

b. **Generator Details:**

Unit No	Capacity	MW Generated	MVAR Generated	Remarks
1				
2				
3				

c. **Lines Connected**:

Sl. No.	Name of line	MW	MVAR	Line Reactor	
				In service	Capacity
1					
2					
3					

d. **No. and rating of ICTs connected**

Sl. No.	Rating		MW	Tertiary reactor MVAR
	Voltage	MVA		
1.				
2.				
3.				
4.				

e. **Status of Bus Reactor, if any**

Sl. No.	Rating	Status of charging/Healthiness

iii On charging condition

Details	Sending end	Receiving end
Voltage		N/A
MVAR		N/A
Open end voltage	N/A	

iv Post charging condition

Details	Sending end	Receiving end
Voltage		
MW		
MVAR		

The line has been/ not has been successfully test charged with or without following operational constraints:

1.
2.
3.

Signature					
Name					
Designation					
Organization				**POWERGRID**	**POWERGRID**
Agency	**Line Erection**	**S/S Erection**	**Line Supplier**	**Line In-Charge**	**S/S In-Charge**