



CERC Draft Terms & Conditions of Tariff Regulation

Presentation
by
POWERGRID

Major Issues for Consideration

- Operation & Maintenance Norms;
- Availability Norms;
- Return on Equity;
- Timeline for Additional RoE;
- Controllable & Uncontrollable Factor;
- Useful life of Substation

Operation & Maintenance Norms



Factors need consideration :

- Time value of money while taking earlier expenditure.
Forex variation, escalation (WPI/CPI).
- Efficiency need to be encouraged not discouraged.
Efficiency is evolved and achieved over the years. The same can not be imposed on previous years performance.
- Pay structure designed to bring efficiency need to be appreciated.
Disallowance of such amount, may be minor, may be highly de-motivating.
- Maintenance not to be compromised, it may be little money but effect is large.
442 billion units costing about Rs. 2,50,000 Crore are handled with a small O&M expenditure of about Rs. 1,700 Crore.
- Change in grid configuration, little experience in 800 kV systems & large synchronous grid operation.
- Higher renewable energy penetration.
- No money pressure for maintenance.
- ● More thrust on reliability.

Operation & Maintenance Norms



Operations and Maintenance Expenses

Norms for AC & HVDC Lines & Bays (2009-14)	09-10	10-11	11-12	12-13	13-14
S/C(Twin & Triple Conductor) (Rs. Lakh/km)	0.358	0.378	0.400	0.423	0.447
400kV Bay (Rs. Lakh/Bay)	52.40	55.40	58.57	61.92	65.46

Norms for AC & HVDC Lines & Bays (2014-19)	14-15	15-16	16-17	17-18	18-19
S/C(Twin & Triple Conductor) (Rs. Lakh/km)	0.397	0.413	0.430	0.448	0.466
400kV Bay (Rs. Lakh/Bay)	55.16	57.44	59.82	62.29	64.87

- Rates for FY 2014-15 have been scaled down to the level of 2010-11.

Step for Adjustment of Employee cost in 2014-19 draft Regulations					
	FY 09	FY 10	FY 11	FY 12	FY 13
Total	3072	3145	3133	3170	3107
Equivalent (400 kV) no. of bays	1256.20	1300.60	1429.20	1692.35	2063.40
Employees per Equivalent (400 kV) bay	2.45	2.42	2.19	1.87	1.51
Ratio of Employees per Equivalent (400 kV) bay w.r.t. FY 2012-13	1.62	1.61	1.46	1.24	1.00
Factor for considering employees cost at the FY 2012-13 level	0.62	0.62	0.69	0.80	1.00

Last year parameters for previous control period used as base for adjustments

Operation & Maintenance Norms



Calculation of CAGR of O&M expenditure of transmission as per draft Regulation

SI	Parameters	08-09	09-10	10-11	11-12	12-13
A	Normalized O&M expenses allocated to S/S (70% of A)	53083	67476	75734	88866	97634
B	Equivalent No. of sub-station bays	1256	1301	1429	1692	2063
	% Change	-	4%	10%	18%	22%
C	O&M expenditure per equivalent (400 kV) AC bay	42.26	51.87	53.00	52.52	47.33
	% Change	-	23%	2%	-1%	-10%
CAGR (FY 2008-09 to FY 2012-13)						2.87%
D	Normalized O&M expenses allocated to AC and HVDC lines (30% of A)	22749.951	28918.47	32457.576	38085.258	41843.118
E	Equivalent ckt-km in commercial operation	65410.69	67473.6	73071.03	82213.49	91394.62
	% Change	-	3%	8%	13%	11%
F	O&M expenditure per equivalent (S/C. twin conductor) ckt-km	0.348	0.429	0.444	0.463	0.458
	% Change	-	23%	4%	4%	-1%
CAGR (FY 2008-09 to FY 2012-13)						7.11%

- **CAGR considering expenditure per bay and per ckm is 4.14%**

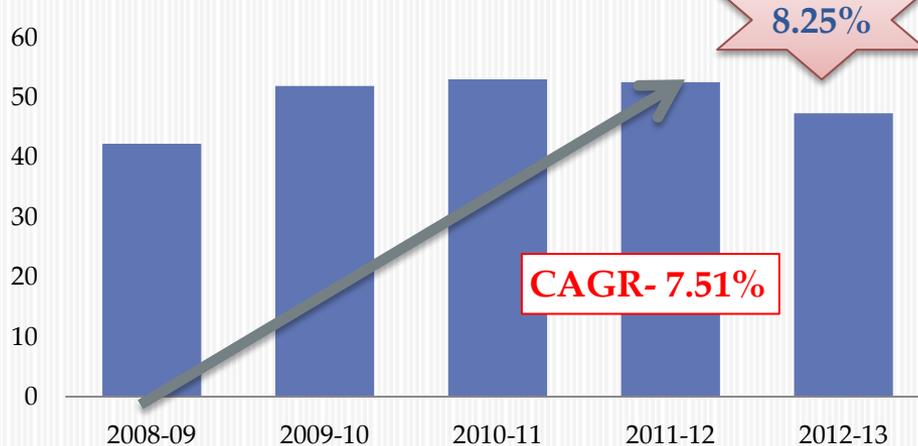
Normalization of O&M Expenditure

Parameters	10-11	11-12	12-13
Equivalent (400 kV) no. of bays	1429	1692	2063
% increase from pervious year	10%	18%	22%
Manpower	3133	3170	3107
% increase in Manpower for Bays	0%	1%	-2%
Equivalent (S/C - Twin Conductor)	73071	82213	91395
% increase from pervious year	8%	13%	11%
Manpower	1193	1293	1308
% increase in manpower for T/L	1%	8%	1%

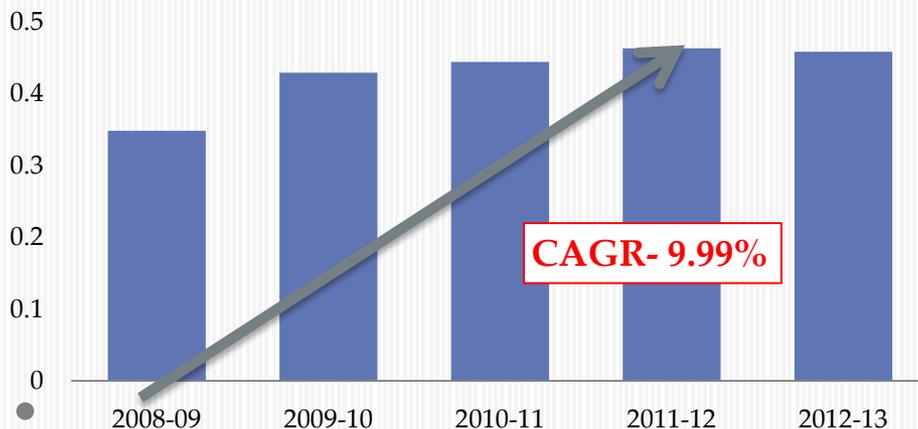
- Unprecedented increase in the asset base for 2012-13 gives an illusion of efficiency improvement in manpower deployed
- Aberrations related to year 2012-13 if taken out and brought at par with other years, CAGR works out to 8.25%.

Escalation Factor for O&M Charges

O&M expenditure per equivalent (400 kV) AC bay (70%)



O&M expenditure per equivalent (S/C. twin conductor) ckt-km (30%)



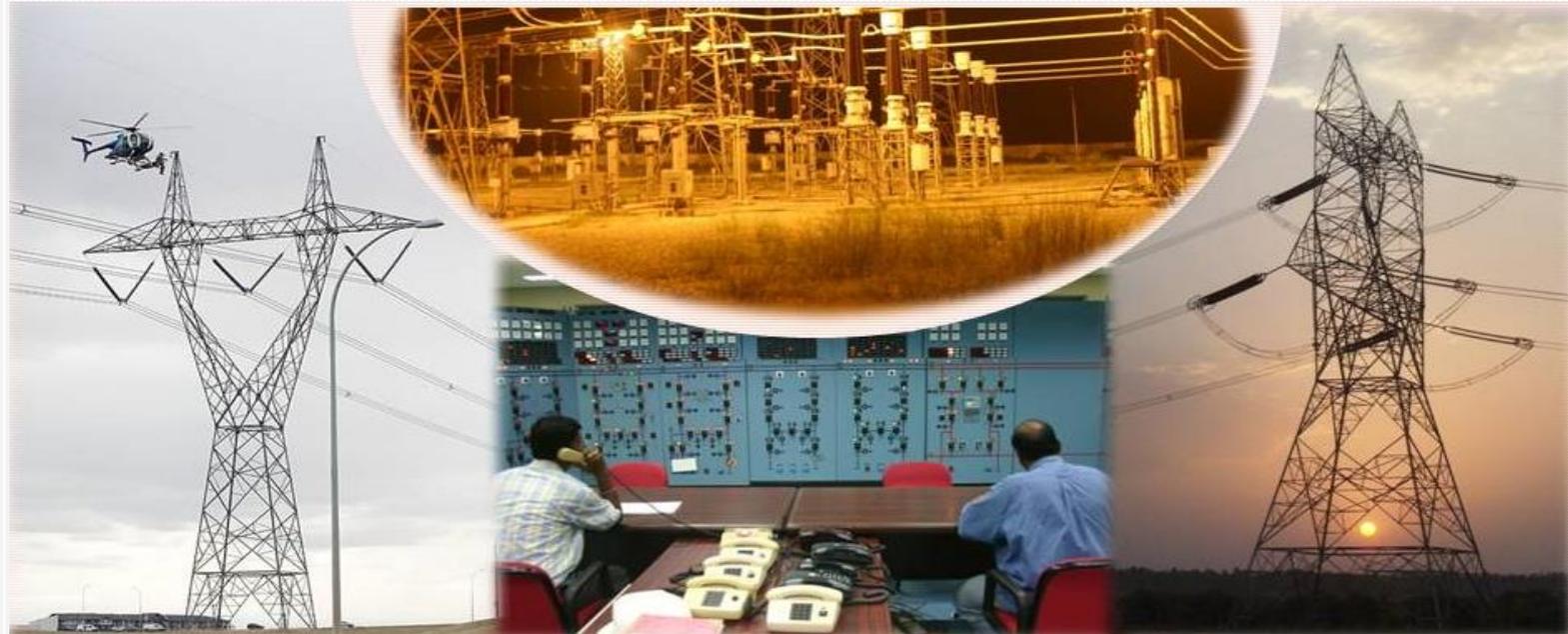
- If CAGR is calculated till 2011-12, the overall escalation factor is around 8.25% which is almost in line with the CPI: WPI indices of 8.35%
- Reduction in O & M expenses specifically in 2012-13 is a transition phase with assets getting added and a non-commensurate increase in manpower expenses.

WPI:CPI indices should be considered for applying the escalation.

Operation & Maintenance Norms

Submission:

Keeping present and future grid conditions, technical & economic scenario in the country to provide scope for enhanced performance through new technologies for ensuring reliable and secured services to the consumers, Hon'ble Commission may consider reasonable O&M charges for transmission sector as has been done earlier.



Availability Norms



- Need of sufficient time for planned maintenance.
- No time/money pressure on maintenance staff to compromise maintenance.
- Incentive for better performance to bring motivation.
- Effect of change in grid configuration from 400 kV to 800 kV level, Renewable Energy on availability is yet to be established.
- Maintenance of 765 kV D/C and Multi Circuit T/L considering induction effect and complexity in conductor configuration.
- Focus on improved reliability, reduction in outages.

Name of region	Voltage level	Capacity	Element	Outage hours	Impact on monthly availability
Southern Region	765 kV	1500 MVA	ICT	720	3.63%
	400 kV	315 MVA	ICT	720	0.76%
	765 kV	240 MVAR	Bus Reactor	720	0.93%
	400 kV	50 MVAR	Bus Reactor	720	0.19%

765kV Element (POWERGRID)	Asset as on Mar 2009	Asset as on Jan 2014	Exp Asset 2016-17
Line	10	31	102
Trans-former	3	42	70
Switchable Reactor	1	46	225

Availability Norms

Submission:

Hon'ble Commission may, therefore, reduce the target availability for the tariff control period 2014-19.



Return on Equity

- Returns have been considered commensurate to the movement of SBI PLR/G-Sec rates in previous Regulations
- Same principle needs to be considered in view of the following:

Indices	2001-04	2004-09	2009-14	2014-19
G-Sec rates	10.33 (Mar'01)	5.43 (Feb'04)	7.12 (Nov'08)	8.76 (Jan'14)
PLR rates	11.50	10.25	12.25	14.75 (Jan'14)
AAA Corporate bond	11.11	6.32 (Feb'04)	9.24 (Mar'09)	9.91(Sep'13)
RoE Permitted	16.00	14.00	15.50 + 0.5	18.5 – 20.5

- Market risk perception in power sector as captured by CAPM suggests higher return
- Effective Returns about 12.5%, since no RoE is allowed during construction.

Submission:

Hon'ble Commission may, therefore, consider enhancing the rate of RoE keeping in view the past principle.

Timeline for Additional RoE

- The stipulated timeline for additional RoE of 0.5% is impractical and almost difficult to achieve.
- Timelines proposed by the Task Force set up in 2005 by MoP only represent the construction period

Transmission Work	Timeline as per draft Regulations (in months)			Timeline as per Report of the Taskforce	
	Plain Area	Hilly Terrain	Snowbound area/@very difficult Terrain	Plain Terrain (Lines> 100km) & Hilly(<50km)	Hilly(>50km)
765 kV S/C TL	30	36	40	34-38	40-44
400 kV D/C Quad TL	32	38	42	34-38	40-44
Substation	Plain Area	Hilly Terrain	Snowbound area/@very difficult Terrain	Plain Area	Hilly Terrain
New 400 kV AC S/s	24	27	30	22-26	31-35
New 765 kV AC S/s	30	34	-	28-32	37-41

Timeline for Additional RoE

- The Task Force report stipulate that schedule indicate construction time of a T/L & S/s. Therefore, suitable margins need to be kept for completion of all the elements of a Project/system.
- ROW and Land Acquisition factors have become more serious today.
- Despite large growth negligible projects could meet the stringent timelines.
- I would like to bring to kind perusal of the Commission that 16% RoE was decided in the previous Regulation, however, subsequently 0.5% RoE was segregated as an incentive for timely completion of the project.

Submission:

- The time line be made practicable or the additional RoE be merged with RoE

Controllable & Uncontrollable Factor

Draft regulations defines Land Acquisition and ROW issues as controllable factors.

- ROW issues are becoming most critical in transmission line construction day by day and may further become much more critical with passage of time.
 - *Land is not acquired but crop / tree compensation is paid.*
 - *8 nos. transmission projects are held up in different parts of the country due to severe ROW issues.*
 - *Issues are not getting resolved even with intervention of highest level in the States/Centre.*
- The land acquisition for substation fall under the Land Acquisition and Rehabilitation & Resettlement Act, 2013,
 - *the time for various activities are defined and have to be followed by the licensee and dependent upon various State & Central Govt. Agencies.*
- Due diligence is always carried out by the Hon'ble Commission before passing tariff order.



Controllable & Uncontrollable Factor

Submission:

ROW issues and land acquisition may, therefore, not be considered as controllable factors. However, the same may be examined by the Hon'ble Commission while passing the tariff order.



Useful life of Substation

- CEA (Technical standards for Electric Plant and Electric Lines) Regulations 2010 : Sub-stations to be designed for a life span of not less than 25 years – therefore designed for 25 years
- International Research Institute (EPRI, USA) : useful life of switchyard components in the range of 20–25 years
- Equipment operating under the Indian grid conditions are heavily stressed due to:
 - *over voltage condition;*
 - *frequent faults in downstream system etc.*
- Failure rate with age > 20 yrs : 42% for transformer, 13 % for reactor, > 100% for converter transformer & > 10% for other S/S equipments
- Obsolescence/technical up-gradation, winding up of production line, non-existence of OEM within 25 yrs
 - *Results in non availability of spares and services*
- Life of Sub Stations may be retained as 25 Years

Thank You

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Employee Cost

- CERC has currently considered Exclusion of PRP from Employee Expenses
- Performance pay is an integral part of employee salary
- The same is not over and above the cost to company for any employee
 - *Exclusion of the same makes senses only when the same is over and above the compensation offered and is purely from the profits of the company.*
- All employees are not associated with O & M function.
 - *Departments viz. accounts, finance, HR, administration and projects have no direct link to the technical performance of POWERGRID*
 - *PRP is rather linked to individual performance, departmental performance together with overall performance of company.*
 - *It may be influenced partly with operational performance, but it is still payable even if organization has not received operational incentive.*

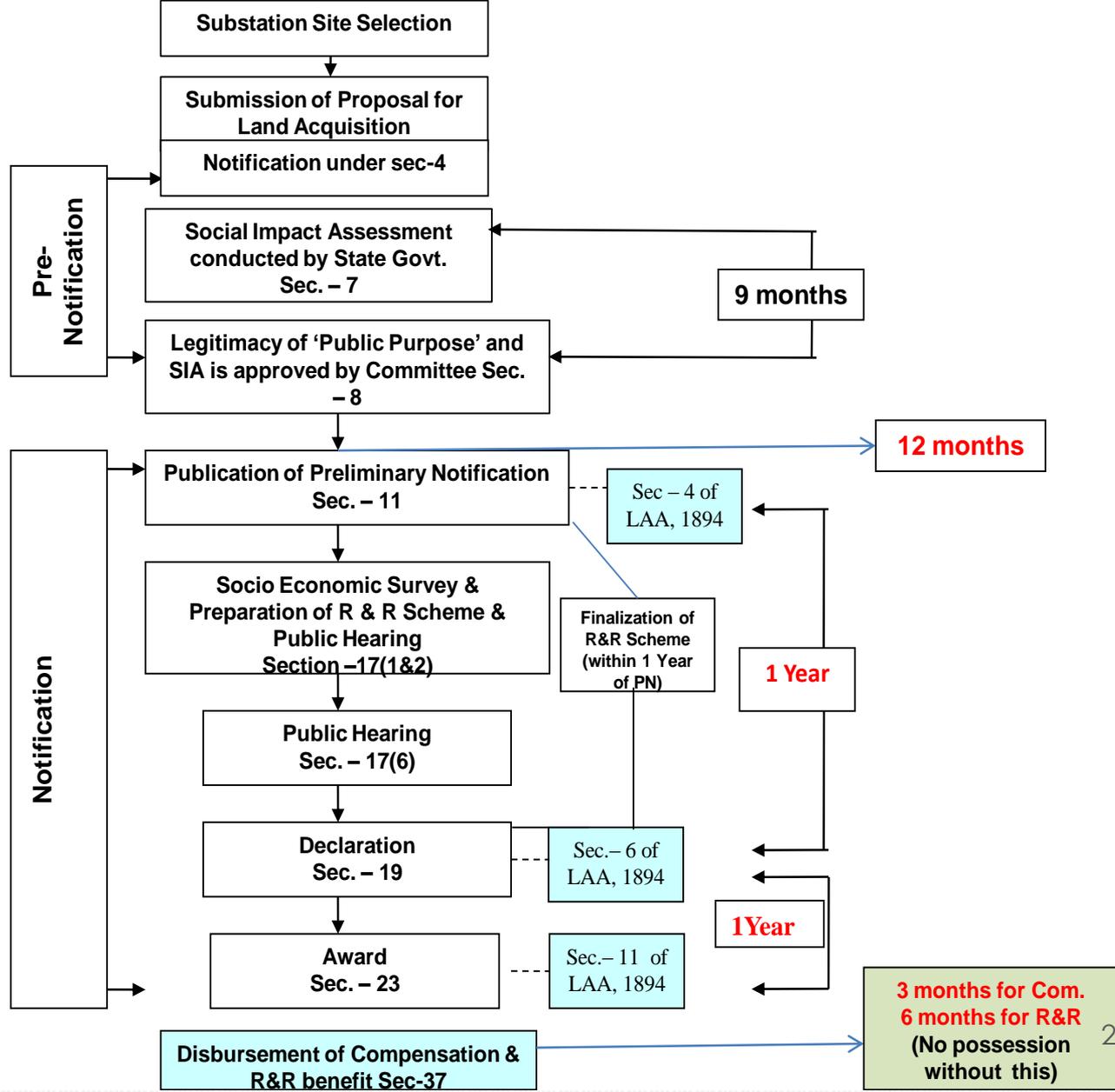


Comparison with Generation

Generation	Transmission
<p>Escalation Factor: CAGR @6.35% per annum based on the increase in Normalized O&M Expenses for 2008-09 to 2012-13 for Generators (coal: 5.71%; Gas: 6.19%; Hydro: 6.04%)</p>	<p>Escalation Factor : Effective CAGR @ 4.14% of increase in Normalized O&M Expenses for 2008-09 to 2012-13</p>
<p>The Norms for 2014-19 block is derived based on the escalation factor @6.35% per annum</p>	<p>The Norms for 2014-19 block is derived based on the escalation factor @4.14% per annum</p>
<p>No separate employee efficiency factor</p>	<p>Employee efficiency factor considered</p>

ACTIVITY CHART FOR LAND ACQUISITION FOR SUBSTATION UNDER THE RIGHT TO FAIR COMPENSATION AND TRANSPARENCY IN LAND ACQUISITION AND REHABILITATION & RESETTLEMENT ACT, 2013

Time frame (Max) from start to possession of land:
3 Years + 9 month = 3 Yrs. 9 months.



Controllable & Uncontrollable Factor



Land Acquisition for Substations

- The Right to Fair Compensation & Transparency in Land Acquisition, Rehabilitation & Resettlement Act 2013 has come into force w.e.f. 1st Jan. 2014
- Final Rules are yet to be notified.
- The proposal, Social Impact Assessment, Socio-Economic Survey and R&R scheme have to concurred/executed/monitored by the special agencies/deptts., set up by the State Govt., before possession of land is handed over.

Forest Approvals

- Forest proposals needs to be submitted to State Forest Deptt.
- To obtain NoCs from various Deptts. like NHAI, PWD, Irrigation, District Collector etc.
- DC Certificates on FRA compliance are to be issued as part of proposal.
- The proposals including tree enumeration, identification/finalization of land for compensatory afforestation (CA), finalization of CA scheme etc. processed by Forest Deptt.
- After formulation at DFO level, the proposal has to go through hierarchy of State Forest Deptt before it is forwarded to MoEF for approval.
- MoEF undertakes site inspection (<100 Ha) before the proposal is considered by FAC. After FAC recommendations and Minister's approval, Stage I clearance is issued.
- The compliance of condition of Stage-I approval takes 3 to 6 months

