

POSOCO's Comments  
on  
behalf of NLDC/RLDCs  
Draft CERC (Terms and Conditions of Tariff)  
Regulations, 2019



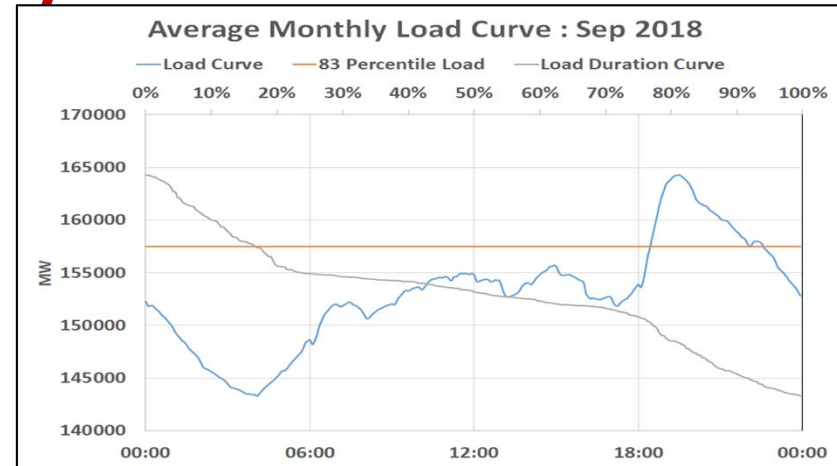
01<sup>st</sup> February 2019

# Introduction

- Consultation Paper : 24<sup>th</sup> May 2018
- POSOCO's comment of Consultation Paper : 31<sup>st</sup> July 2018
- Draft Regulations : 14<sup>th</sup> December 2018
- Regulations must complement reliability & security of the grid
  - Energy is cheap but Reliability is expensive
  - Grid must derive benefits from high investment in generation & transmission
  - Flexibility, Dependability, Reliability, Resilience

# Generation Availability : Peak-Off peak declaration by RLDC

- Chapter 11, Clause 51(3) of draft regulations
  - Peak and Off-Peak hour declaration by RLDCs
- Different peak and off peak for different regions
- Less significance of regional boundaries with grid integration
- Objective to ensure sufficient generation to support national peak
- **Suggestion**  
Peak and Off-Peak to be considered based on All



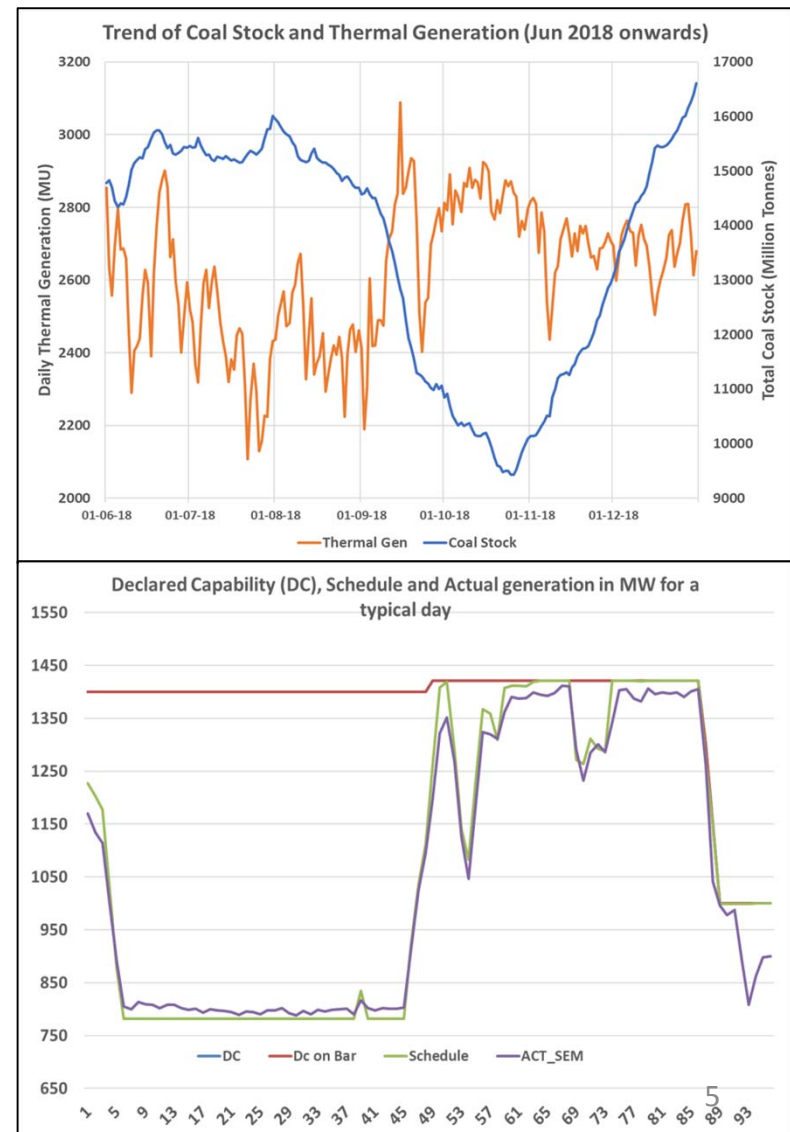
| Month | Period I |      | Period II |      | Period III |      |
|-------|----------|------|-----------|------|------------|------|
|       | From     | To   | From      | To   | From       | To   |
| Jan   | 0730     | 1100 |           |      | 1830       | 1900 |
| Feb   | 0700     | 1000 |           |      | 1845       | 1945 |
| Mar   | 0645     | 0745 | 1045      | 1145 | 1830       | 2030 |
| Apr   |          |      |           |      | 1900       | 2300 |
| May   |          |      |           |      | 1945       | 2345 |
| Jun   |          |      |           |      | 1945       | 2345 |
| Jul   |          |      |           |      | 1900       | 2300 |
| Aug   |          |      |           |      | 1900       | 2300 |
| Sep   |          |      |           |      | 1830       | 2230 |
| Oct   |          |      | 1030      | 1200 | 1800       | 2030 |
| Nov   |          |      | 0915      | 1115 | 1730       | 1930 |
| Dec   |          |      | 0830      | 1100 | 1730       | 1900 |

# Generation Availability

- Draft regulation (59A) proposes:
  - 83% target quarterly availability
  - Annual scheduled plant maintenance period excluded
- Maintenance during high demand period
  - Adequacy issues
- Suggestion
  - Target availability; no exclusion on account of planned maintenance

# Fuel Adequacy

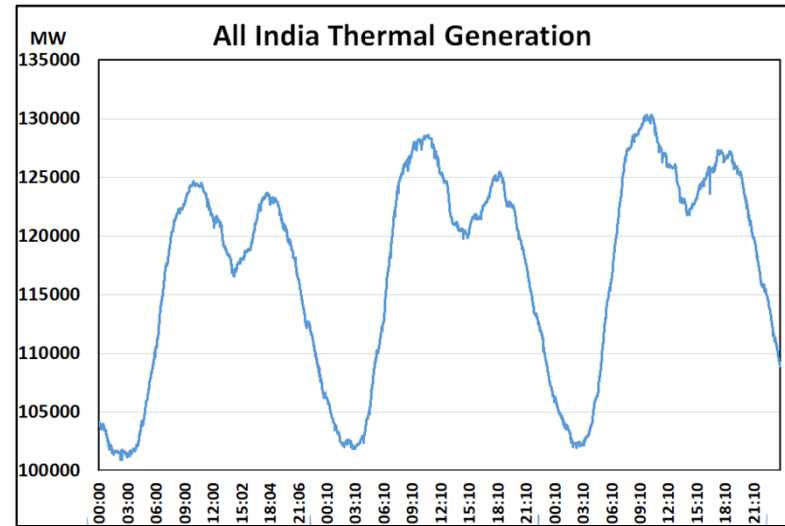
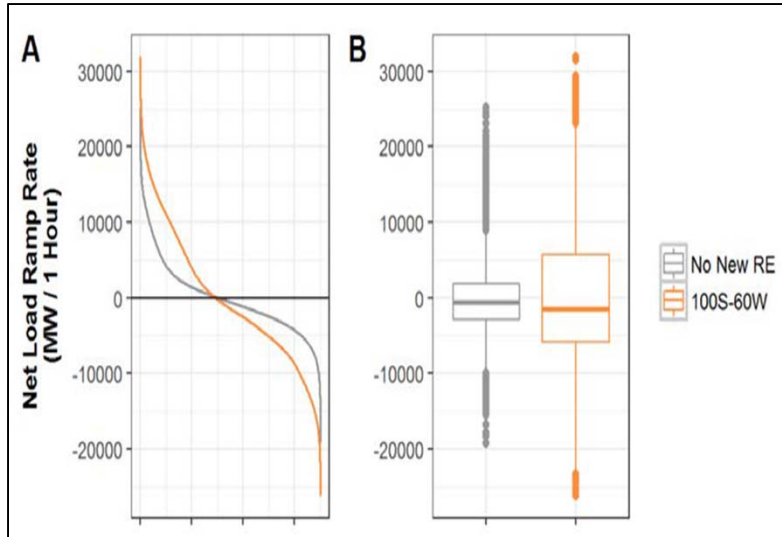
- Low availability of on site fuel stock
- Full DC but less fuel stock
  - DC revision in case of sustained full schedule
  - Threat to grid security
- Quarterly Plant availability Calculation :
  - A welcome step



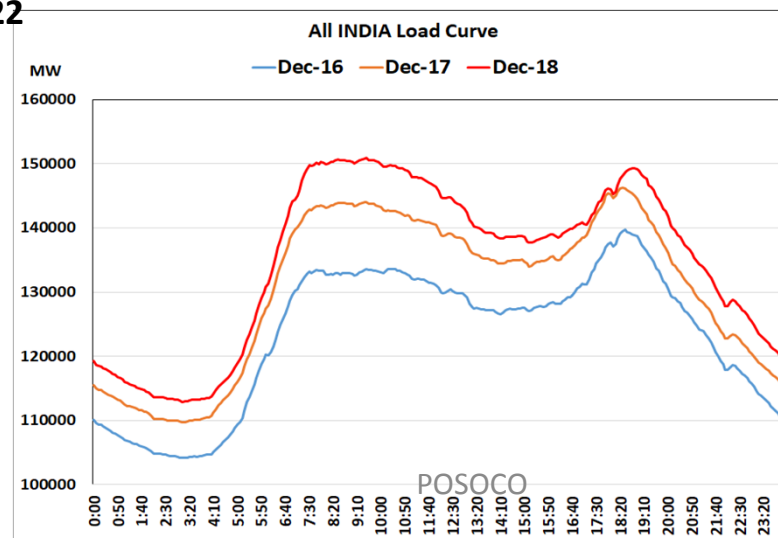
# Fuel Adequacy

- In case, provision of quarterly availability gets changed to existing annual availability, following is suggested:
  - Day ahead and weekly fuel availability declaration
  - 20% weightage to weekly fuel availability and 80% weightage to day ahead availability

# Generation Flexibility



Net Load Ramp Rate 2022

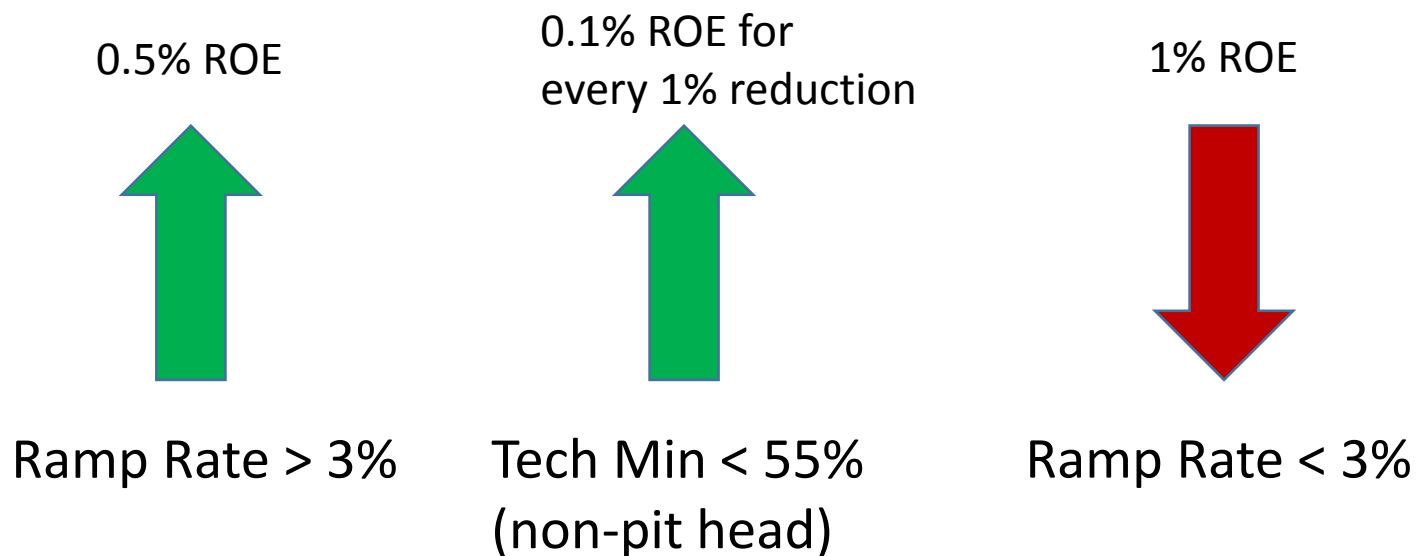


Thermal Generation flexing to 55%

Increasing difference between peak and off-peak

# Generation Flexibility

- Suggestion (Clause 30)

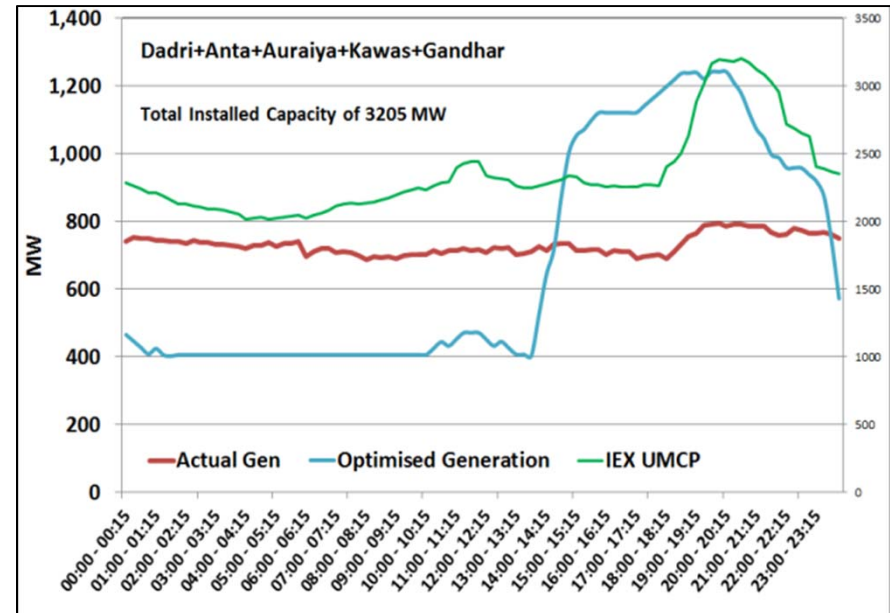


A detailed report titled "Analysis of Ramping Capability of Coal-Fired Generation in India" submitted along with comments.



# Generation Flexibility

- Peaking requirement from Gas stations
  - Less domestic gas availability
  - Requirement under high RE penetration

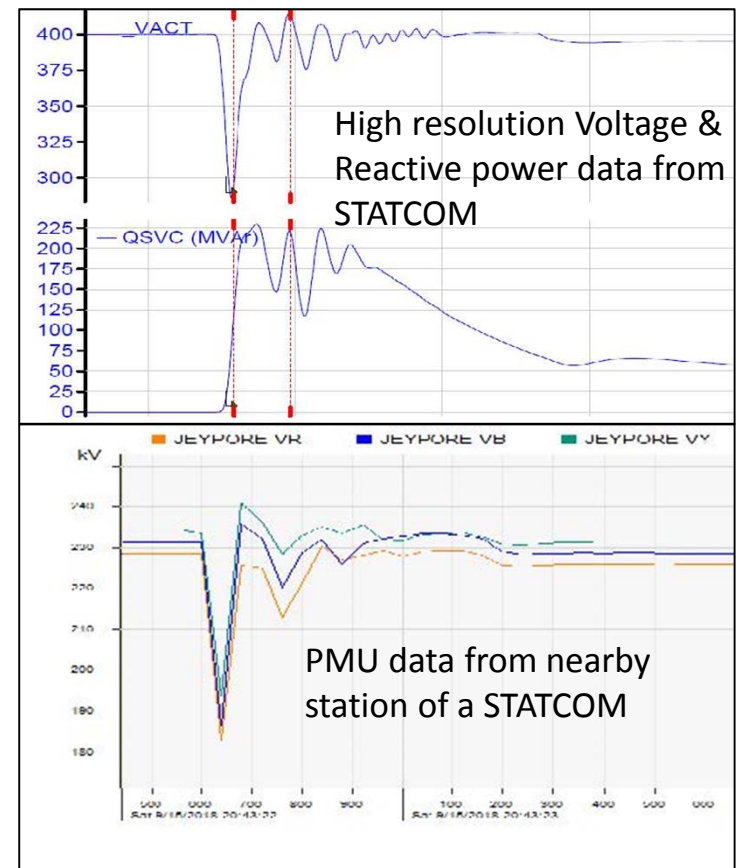


- **Suggestion (Clause 53)**

- Declaration of max DC for 3 hours for the entire plant.
- Separate declaration on domestic gas, RLNG and liquid fuel for the next day.
- Calculation of monthly availability based on the max DC given for 3 hours for the entire plant.

# Transmission Flexibility : FACTS

- 13 STATCOMs planned in India
  - Dynamic reactive power compensation
- 8 STATCOMs + 4 SVCs (around 325 Cr YTC)
- Important to ensure availability and performance to support grid reliability
  - Real Time Data
  - Installation of PMUs to assess dynamic performance
  - High resolution data from site
- **Suggestion (Appendix II) :** Failure to furnish the above data to render STATCOM unavailable



# Transmission Flexibility : FACTS

- **Series Compensation**

- 50 FSC + 6 TCSC
- Surge Impedance loading(SIL) based weightage for transmission line availability removed
- No impact of FACTS based devices availability in transmission availability
- **Suggestion**
  - Series/Shunt compensating devices may be defined as individual element with degree of compensation

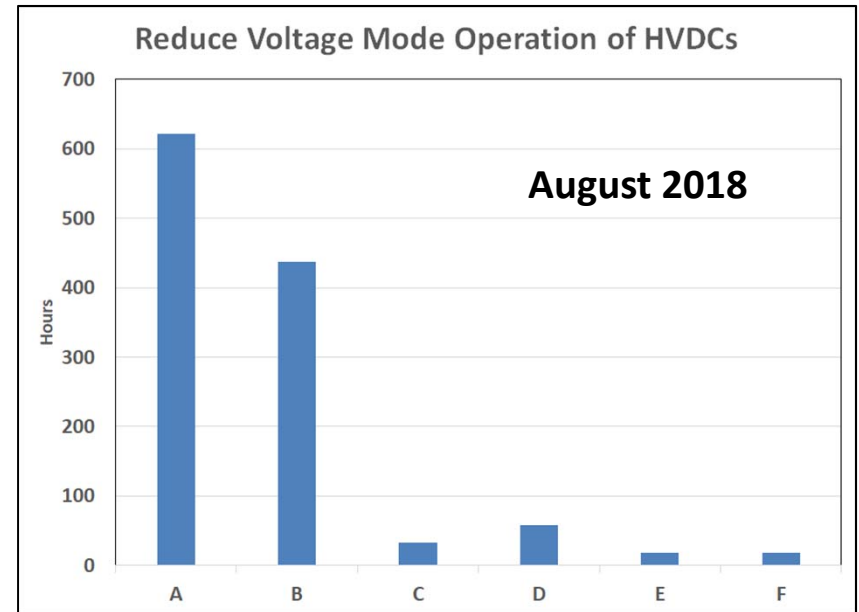
\*FSC : Fixed Series Compensation ; TCSC : Thyristor Controlled Series Compensation

# Grid Resilience: Voltage Source Converter (VSC) based HVDC Operation

- HVDC Pugalur-Thrissur (VSC Based HVDC)
  - Likely to be commissioned in control period 2019-2014 (520 million USD project cost (as per Siemens website))
- VSC based HVDCs can improve system reliability
  - Black-start feature : Important for grid reliability & restoration
  - Reactive power support even with no power flow
  - Frequency and Voltage control under islanded operation
- **Suggestion** : Tariff regulations to ensure availability of these features for grid reliability
  - Twice a year testing : Full ROE
  - Failure to perform : 0.5% reduction in ROE

# Transmission Reliability : HVDC Availability

- 7 long distance HVDC links
- Reduced Voltage Operation (RVO) facility in HVDC
  - Operating capacity reduces with voltage reduction
  - Overload capability unavailable during RVO mode
  - Simultaneous RVO operation of multiple HVDCs
  - Less margin available for system operator in real time
- **Suggestion (Appendix II)**
  - HVDC availability certification to be modified
  - Additional 12 hours HVDC outage to be considered in addition to the actual outage for more than 2 tripping in a year.



$$\text{Reduction in HVDC Availability} = T - (T \cdot X / R)$$

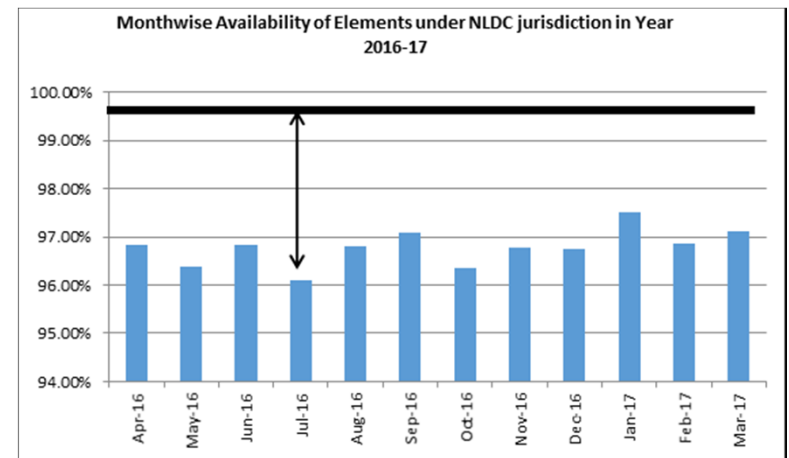
*Rated Capability (R ):* Maximum Capability of HVDC pole as defined in Tariff petition order by CERC

*Reduced Capability (X):* Revised declared capability of HVDC

*T :* Time period during which HVDC Pole operated on reduced capability

# Transmission Reliability : Operational Availability vs Certified Availability

- Difference between operational and certified availability
  - Outages deemed available under different circumstances
  - Need for data transparency : Reporting of operational availability and deemed availability
  - Data to be used as reference in future availability verification and outage planning.



- **Suggestion**

- RPCs to have a transparent procedure for excluding outages attributable to licensee; exclusions must be minimal
- RPCs to display full details of availability certification on its website

# Transmission Availability

- **LTA/MTOA curtailment due to outage**
  - Outage hours multiplied by a factor of 2, in case of impact on generation evacuation
  - Curtailment of LTA/MTOA also impacts generation evacuation
  - **Suggestion (Clause 61)**
    - Outage hours to be doubled in case of LTA/MTOA curtailment (planned/unplanned outages)

Thanks