1 Suggestions on draft regulation

Under section 178 of the electricity act 2003 the CERC has laid down draft regulations titled Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015. We are pleased to submit thefollowing suggestions on the proposed regulations:

1.1 Suggestions on Section (5) (1): Eligibility

1) To create a liquid market and push technical innovations the eligibility should be extended and the reserve should be addressed as positive (up) and negative (down) reserve separately.
   a) The eligibility should be defined as technology and provider neutral, i.e. only the capacity to provide positive or negative reserve of a specified power and duration should be asked.
   b) The market should be distinguished in one part for positive and another part for negative reserve. For instance, in a negative reserve market also plants running on full load can participate or demand response of industrial customers can be stimulated. In a positive reserve market also stand-by generators like larger industrial backup systems could be involved.

1.2 Suggestions on section (3) (1):Objectives

With increasing penetration and reliance on renewable energy resources, operational concerns over maintaining thebalance between system load and energy generation increases. Further highly ambitious targets of achieving 175 GW of RE installed capacity by 2022 necessitates introduction of other ancillary services. It is observed that the (Ancillary Services Operations) Regulations, 2015 aims to address only frequency control and transmission congestion. It is suggested that the market for other required ancillary services (listed below) shouldalso be introduced in short to medium term:

a) Primary Frequency control: Primary control is a local automatic control which adjusts the active power generation of generating units and consumption of controllable loads to check the deviation in frequency. In particular, it is designed to stabilize the frequency following large generation or load outages. It is thus indispensable for the stability of the power system.

All the generators that are located in a synchronous zone and are fitted with a speed governor (Having droop settings) perform this control automatically. The demand side also participates in this control through the self-regulating effect of frequency-sensitive loads such as induction motors or the action of frequency-sensitive relays that disconnect or connect some loads at given frequency thresholds.

b) Secondary Frequency control: Secondary frequency control is a centralized automatic control that adjusts the active power production of the generating units to restore the frequency and the interchanges with other systems to their target values following an imbalance. This is achieved by either changing the set point or reference point of generators, or by starting and stopping of power plants. Only the generating units located in the control area where the imbalance has occurred should participate in secondary control. The goal of secondary frequency control is to minimize the area control error (ACE). After an unforeseen load power change, the primary frequency control will adjust generation to achieve active power balance. This will result in a frequency deviation due to the permanent droop of the primary frequency regulation in the power plants. However, this regulation will also result in a deviation of power transfer between control

areas from the intended power transfer in the system. The automatic secondary frequency regulation will re-establish the intended power transfer.Secondary frequency control aims to bring the ACE to zero with the help of proportional integral(PI) controller and filters.

c) **Voltage Control Ancillary service**: System voltage control is used to maintain the voltages at different nodes in the system within the specified limit and to compensate for the requirement of reactive power in the system. Because of high inductance of lines and transformers, reactive power does not travel well through the grid, so reactive power support must be provided much closer to reactive loads.

d) **Power Flow Control service:**They are services are used to control the flow on inter-connectors within their limits. Overloading of lines connecting one control area to another can be reduced by :
    - Shedding load or increasing generation in the exporting area
    - Generation backing down in the exporting area

e) **System Restart Ancillary Services:** System restart ancillary services (SRAS) are reserved for contingency situations like partial / total grid disturbances wherein the electrical system must be restarted in line with the regional black start procedure. Black start is a vital but inexpensive service

It has been mentioned in the draft regulations that the nodal agency (NLDC) shall come out with detailed procedure on operationalising the ancillary services including scheduling and dispatch (clause 14 of draft regulation). GIZ would be pleased to submit suggestions on the procedures as and when NLDC publishes them.