

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 79/RC/2017

Coram:

**Shri Gireesh B. Pradhan, Chairperson
Shri A. K. Singhal, Member
Shri A.S. Bakshi, Member
Dr. M.K. Iyer, Member**

**Date of Hearing : 21st November, 2017
Date of Order : 6th December, 2017**

IN THE MATTER OF

Automatic Generation Control (AGC) pilot project

AND

IN THE MATTER OF

National Load Despatch Centre
Power System Operation Corporation Ltd.
(A Government of India Enterprise) B-9,
Qutab Institutional Area, Katwaria Sarai
New Delhi-110016

...Petitioner

VERSUS

1. NTPC Limited,
Plot No A-8A,
Sector-24, Noida,
Uttar Pradesh, India- 201301
2. Central Transmission Utility,
Saudamini, Plot No. 2,
Sector-29, Gurgaon-122 001(Haryana).

Northern Region

3. Delhi Transco Limited,
33kV, Sub Station Building,
Minto Road, New Delhi -110002.
4. Haryana Vidyut Prasaran Nigam Limited,
XEN/LD & PC, SLDC Complex,
Sewah Panipat -132103.
5. Himachal Pradesh State Electricity Board,
HP Load Despatch Society,
SLDC complex, Totu,
Shimla -171011.
6. Jammu & Kashmir Power Development Department,
SLDC Building,
220 kV Grid Station Narwal,
Jammu -180007.
7. Punjab State Transmission Corporation Limited,
Ablowal, Patiala, SLDC Building,
Near 220KV Grid Substation,
PSTCL, Ablowal,
Patiala -147001
8. Rajasthan RajyaVidyut Prasaran Nigam Limited,
State Load Despatch Centre,
Rajasthan RajyaVidyut Prasaran Nigam Limited,
Ajmer Road, Heerapura,
Jaipur -302024
9. Uttar Pradesh Power Transmission Corporation Limited,
Power System,5th Floor,
Shakti Bhawan,14 Ashok Marg,
Lucknow -226001
10. Power Transmission Corporation of Uttarakhand Limited,
400 KV Substation,
Veerbhadra, Rishikesh -249202
11. General Manager,
Singrauli Super Thermal Power Station,
Shakti Nagar, UP-231222
12. General Manager,
Rihand Super Thermal Power Station-I,
Rihand Nagar, UP-231223

13. General Manager,
Rihand Super Thermal Power Station-II,
Rihand Nagar, UP-231223
14. General Manager,
Rihand Super Thermal Power Station-III,
NTPC Rihand, Dist-Sonbhadra,
UP - 231223
15. General Manager,
Dadri, National Capital Power Project,
DadriDhaulana Road,
Distt.GautamBuddh Nagar,
UP-201008
16. General Manager,
Dadri – Stage - II,
National Capital Power Project,
Dadri Dhaulana Road,
Distt.Gautam Buddh Nagar,
UP-201008
17. General Manager,
Firoz Gandhi Unchahar Thermal Power Project-I,
Unchahar, Distt. Raibareilly,
UP
18. General Manager,
Firoz Gandhi Unchahar Thermal Power Project-II,
Unchahar, Distt. Raibareilly,
UP
19. General Manager,
Firoz Gandhi Unchahar Thermal Power Project-III,
Unchahar, Distt. Raibareilly,
UP
20. General Manager,
Dadri Gas Power Project,
Dhaulana Road, Distt.
Gautam Buddh Nagar,
UP-201008
21. General Manager,
Auraiya Gas Power Project(Gas Fired, RLNG Fired, Liquid Fired),
Dibiyapur, Distt Etawah,
UP-206244

22. General Manager,
Anta Gas Power Project (Gas Fired, RLNG Fired, Liquid Fired),
Distt. Baran,
Rajasthan-325209
23. Station Director,
Narora Atomic Power Station,
Narora, Distt. Bulandshahar,
UP-202389
24. Station Director,
Rajasthan Atomic Power Station-B,
Anu Shakti Vihar, Kota,
Rajasthan-323303
25. Station Director,
Rajasthan Atomic Power Station-C, (RAPS-5&6)
PO-Anushakti, Kota,
Rajasthan-323304
26. General Manager,
Bairasiul Hydro Electric Project,
NHPC Ltd., Surangini,
Distt. Chamba, HP-176317
27. General Manager,
Salal Hydro Electric Project,
NHPC Ltd,
Jyotipuram, Distt. Udhampur,
J&K-182312
28. General Manager,
Tanakpur Hydro Electric Project,
NHPC Ltd.,
Banbassa, Distt. Champawa,
Uttarakhand-262310
29. General Manager,
Chamera-I Hydro Electric Project,
NHPC Ltd.,
Khairi, Distt.
Chamba, HP-176310
30. General Manager,
Uri Hydro Electric Project,
NHPC Ltd.,
Mohra, Distt. Baramulla,
J&K-193122

31. General Manager,
Chamera-II Hydro Electric Project,
NHPC Ltd.,
Karian, Distt.Chamba,
HP-176310
32. General Manager,
Chamera-III Hydro Electric Project,
NHPC Ltd.,
Dharwala, Distt.-Chamba,
HP-176311
33. General Manager,
Dhauliganga Hydro Electric Project,
NHPC Ltd.,
Tapovan, Dharchula, Pithoragarh,
Uttarakhand-262545
34. General Manager,
Dulhasti Hydro Electric Project,
NHPC Ltd.,
Chenab Nagar, Distt. Kishtwar,
J&K-182206
35. General Manager,
SatlujJalVidyut Nigam Ltd. Power Project,
Jhakri, Rampur, Distt. Shimla,
HP-172201
36. General Manager,
Tehri Hydro Development Corporation Ltd.,
Pragatipuram, Rishikesh,
Uttarakhand-249201
37. General Manager,
Uri 2 Hydro Electric Project,
NHPC Ltd.,
Nowpura, Distt. Baramulla,
J&K-193123
38. General Manager,
Sewa-II Power Station, Mashke,
P.O-Khari,Tahsil-Dalhausie,
Dist-Chamba,
HP-176325

39. General Manager,
Koteshwar HEP,
THDCIL, Koteshwerpuram,
Tehri Garwal-249002
40. General Manager,
ADHPL Prini,
Tehsil Manali,
Distt- Kullu (H.P).
41. General Manager,
Indra Gandhi Super Thermal Power Project
VPO -Jharli, TahsilMatanhail,
DistJhajjar (Haryana)-124125
42. General Manager,
KarchamWangtoo HEP,
Jaiprakash Power House Ventures Limited Baspa -II
Hydro-Electric Project Sholtu Colony,
PO- Tapti
DistKinnaur, -172104 (HP)
43. Plant In Charge,
Shree Cement Thermal Power Project Bangurnagar,
Beawar ,Dist Ajmer,
Rajasthan -305901
44. LancoBudhil HPS Ltd,
Plot # 404-405, Phase-3,
UdyogVihar, Gurgaon-122016

WesternRegion

45. MSLDC,
Airoli, Navi Mumbai,
Airoli, Thane-Belapur Road,
Navi Mumbai-400708.
46. State Load Despatch Centre,
MPPTCL, Jabalpur,
O/o Chief Engineer (SLDC),
MPPTCL, Nayagaon,
Jabalpur
47. SLDC Gotri Vadodara,
Gujarat, 132kV Gotri s/s compound,
Opposite Kalpvruj Complex,
Gotri Road,
Vadodara

48. Chhattisgarh State Load Despatch Centre,
C.E(LD),State Load Despatch Centre,
CSPTCL, Daganiya-HQ,
Raipur, Chhattisgarh
49. General Manager, Korba STPS STG (I& II),
National Thermal Power Corporation,
P.O. VikasBhavan, Jamnipali,
Korba(Distt.),
Chhattisgarh- 495 450.
50. General Manager,
Korba STPS STG (III),
National Thermal Power Corporation,
P.O. Vikas Bhavan, Jamnipali,
Korba(Dist),
Chhattisgarh- 495 450.
51. General Manager,
STAGE-I, Vindhyachal STPS,
National Thermal Power Corporation of India Ltd,
P.O Vindhyanagar, Sidhi(Dist),
Madhya Pradesh – 486 885
52. General Manager,
STAGE-II, Vindhyachal STPS,
National Thermal Power Corporation of India Ltd,
P.O Vindhyanagar, Sidhi(Dist),
Madhya Pradesh – 486 885
53. General Manager,
STAGE-III, Vindhyachal STPS,
National Thermal Power Corporation of India Ltd,
P.O Vindhyanagar, Sidhi(Dist),
Madhya Pradesh – 486 885
54. General Manager,
STAGE-IV, Vindhyachal STPS,
National Thermal Power Corporation of India Ltd,
P.O Vindhyanagar, Sidhi (Distt.),
Madhya Pradesh – 486 885
55. General Manager,
Kawas Gas Power Project,
National Thermal Power Corporation of India Ltd,
P.O. Aditya Nagar,
Surat- 394 516

56. General Manager,
Gandhar Gas Power Project,
National Thermal Power Corporation of India Ltd,
P.O.NTPC Township, Bharuch (Distt.),
Gujarat- 392215
57. General Manager,
SIPAT TPS Stg-I,
National Thermal Power Corporation of India Ltd,
SIPAT, Chhattisgarh.
58. General Manager,
SIPAT TPS Stg-II,
National Thermal Power Corporation of India Ltd,
SIPAT, Chhattisgarh.
59. General Manager,
Mouda STPP,
NTPC Ltd,
Mouda Ramtek Road,
P.O.Mouda, Nagpur (Dist),
Maharashtra
60. General Manager ,
2 X 135 MW Kasaipali Thermal Power Project,
ACB (India) Ltd.
District - Korba
Chhattisgarh Chakabura 495445
61. General Manager,
Bharat Aluminium Co. Ltd,
Captive Power plant-II,
BALCO Nagar Chhattisgarh
Korba 495684
62. Executive Director,
Costal Gujarat Power Ltd,
TundaVandh Road,
Tunda Village, Mundra,
Gujarat Kutch 370435
63. Executive Director,
DB Power,
Village - Baradarha,
Post - Kanwali,
Dist - Janjgir, Champa,
Chhattisgarh Baradarha 495695
64. Executive Director,
Jindal Power Ltd. Stg-I,

OP Jindal STPP, PO-Tamnar,
Gjarghoda Tehsil,
Chhattisgarh District - Raigarh, 496107

65. Executive Director,
Jindal Power Ltd. Stg-II,
OP Jindal STPP,
PO-Tamnar,
Gjarghoda Tehsil,
Chhattisgarh District - Raigarh, 496107
66. Executive Director,
Plot No Z-9,
Dahej SEZ Area (Eastern side),
Dahej, Taluka-Vagra, Gujarat Dist-Bharuch, 392130
67. Executive Director,
EMCO Power Ltd,
Plot No B-1, Mohabala MIDC Growth Center
Post Tehsil - Warora,
Dist Chandrapur-Maharashtra 442907
68. Executive Director,
ESSAR POWER MP LTD.
Village Bandhora,
Post Karsualal, Tehsil Mada,
Distt. Singrauli
Madhya Pradesh-486886
69. General Manager,
GMR CHHATTISGARH ENERGY LTD
Skip House, 25/1, Museum Road
Karnataka Bangalore 560025
70. Managing Director,
Jaypee Nigri Super Thermal Power Project,
Nigri District, Madhya Pradesh
Singrauli 486668
71. Executive Director,
DCPP, OP Jindal STPP,
PO-Tamnar, Gjarghoda Tehsil,
Chhattisgarh District - Raigarh, 496107
72. Station Director,
Nuclear Power Corporation of India Ltd,
Kakrapara Atomic Power Station,
PO - via Vyara,
Gujarat Dist - Surat 395651

73. Station Director,
Tarapur Atomic Power Station 1&2,
Nuclear Power Corporation of India Ltd,
P.O. TAPP, Thane(Dist),
Maharashtra- 401 504
74. Station Director,
Tarapur Atomic Power Station 3&4,
Nuclear Power Corporation of India Ltd,
P.O. TAPP, Thane(Distt.),
Maharashtra- 401 504
75. Managing Director,
Korba West Power Co.Ltd.,
Village –Chhote Bhandar,
P.O. - Bade Bhnadar,
Tehsil - Pussore,
District - Raigarh,
Chhattisgarh Raigarh 496100
76. Managing Director,
KSK Mahanadhi,
8-2-293/82/A/431/A,
Road No 22 Jubilee Hills
Andhra Pradesh Hyderabad 500033
77. General Manager,
LANCO Power Ltd,
Plot No - 397, Phase -III,
UdyogVihar, Haryana
Gurgaon 122016
78. General Manager,
NTPC-SAIL Power Company Private Ltd,
Puranena Village,
Chhattisgarh Dist - Durg,
Bhilai 490021
79. General Manager,
Ratnagiri Gas & Power Pvt Ltd,
2nd Floor, Block-2, IGL Complex,
Sector-126, Expressway,
Uttar Pradesh
Noida 201304
80. Managing Director,
Sasan Power Ltd,
DAKC, I Block,
2nd Floor, North Wing,
Thane Belapur Road,

Koparkhairana Maharashtra
New Mumbai 400710

81. Managing Director,
VandanaVidyut Bhavan,
M. G. Road
Chhattisgarh Raipur 492001
82. Managing Director,
RAPP Transmission Company Limited,
Mira Corporate Suites,
1&2 Ishwar Nagar,
Okhla crossing,
Mathura road,
New Delhi, 110065
83. General Manager,
LARA,
National Thermal Power Corporation of India Ltd,
Chappora, PO-Pussora,
Raigarh, Chhattisgarh.
84. General Manager,
Solapur,
National Thermal Power Corporation of India Ltd,
Western Region HQ,
Samruddhi Venture Park,
2nd Floor, MIDC Marol,
Andheri East, Mumbai,
Maharashtra.

Eastern Region

85. State Load Despatch Center,
GRIDCO Colony
PO-Mancheswar Railway Colony,
BBSR Bhubaneshwar -751070
86. State Load Despatch Center,
Jharkhand State Electricity Board (JSEB)
Kushai Colony, Doranda,
Ranchi-834002
87. SLDC-BSEB,
Patna, Bihar State Electricity Board,
VidyutBhawan, Jawaharlal Nehru Marg,
Patna-800021
88. SLDC-W.Bengal,
P.O. DaneshSeikh Lane,

Andul Road
Howrah – 711109

89. Damodar Valley Corporation,
DVC Tower,
VIP Road, Kolkata,
WB 700054
90. Energy and Power Deptt.,
Govt. of Sikkim
Kazi Road,
Gangtok 737 201
91. General Manager,
Farakka Super Thermal Power Plant-I&II,
NTPC Ltd.,
Farakka, WB 742236
92. General Manager,
Kahalgaon Super Thermal Power Plant-I NTPC Ltd,
Bhagalpur Bihar 813214
93. General Manager,
Kahalgaon Super Thermal Power Plant-II NTPC Ltd,
Bhagalpur Bihar 813214
94. Executive Director,
Talcher Super Thermal Power Stn-I NTPC Ltd,
Nayapalli, Odisha 751012
95. Chief Engineer (Elect),
Teesta V HEP,
NHPC,
Singtam, East Sikkim 737134
96. Chief Engineer (Elect),
Teesta III HEP,
NHPC,
North Sikkim, Sikkim, India
97. Chief Engineer,
Rangit Hydro Electric Project NHPC,
P.O. Rangit Nagar
South Sikkim 737111
98. General Manager,
Farakka Super Thermal Power Plant-III,
NTPC Ltd., Farakka,
WB 742236

99. Sr. VP,
Sterlite Energy Limited
1st. Floor, City Mart Complex,
Baramunda,
Odisha 751023
100. CEO,
Maithon Power Limited
MA-5 Gogna Colony,
P.O: Maithon, Dhanbad,
Jharkhand 828027
101. Addl. General Manager,
National Thermal Power Corporation Limited,
BARH Thermal Power Station,
Patna, Bihar 803213
102. Chairman,
GATI Infrastructure Ltd,
268, Udyog Vihar,
Phase-IV, Gurgaon,
Haryana 122001
103. DGM (Electrical),
Adhunik Power & Natural Resource Limited
Village: Padampur,
PS: Kandra Tata-Seraikela Road,
Jharkhand 832105
104. General Manager,
GMR Kamalanga Energy Ltd.,
Plot no-29, Satyanagar,
Odisha, Bhubaneshwar, 751007
105. General Manager,
Jindal India Thermal Power Limited,
Plot no-12, Local shopping complex,
Sector – B1, Vasant Kunj,
New Delhi, 110070
106. General Manager,
Ind-Barath Energy Utkal Limited,
Sahajbahal, PO Cgarpali-Barpali,
Dist- Jharsuguda,
Odisha, 768211
107. General Manager,
Jorethang HEP,
DANS Energy PVT Limited,
5th floor, DLF Building no.8,

Tower C, DLF Cyber city,
Phase –II,
Gurgaon, 122002.

108. General Manager,
Bhartiya Rail Bijlee Company Limited,
Nabinagar Thermal Power Project,
Nabinagar, Khera Police Station,
Aurangabad, Bihar-824303.

Southern Region

109. Andhra Pradesh State Load Dispatch Centre,
Room No. 611, 6th Floor,
A Block APTRANSCO,
VidyutSoudha, Khairatabad
110. State Load Despatch Centre,
KPTCL, 28, Race course Cross Road,
Bangalore -560009
111. State Load Despatch Centre, Kalamassery,
Executive Engineer O/o Chief Engineer, (Transmission),
System Operation, Kalamassery-683503
112. System Control Centre,
Electricity Department, Puducherry,
137, NethajiSubhash Chandra Bose Salai,
Electricity Department-605001
113. TANTRANSCO, SLDC, MLDC
Block, 144 Anna Salai,
Chennai-600002
114. Telangana SLDC, Chief Engineer,
Room No 611 A Block,
SLDC of the State of Telangana (TSSLDC),
TSTRANSCO, VidyutSoudha,
Khairtabad, Hyderabad-500082
115. General Manager,
National Thermal Power Corporation Ltd.,
SR Headquarters II & V Floors,
MCH Complex,
R.P.Road, Secunderabad-500 003,
116. General Manager,
National Thermal Power Corporation Ltd.,
SR Headquarters II & V Floors,
MCH Complex,

- R.P.Road, Secunderabad-500 003,
117. General Manager,
Neyveli Lignite Corporation Ltd.,
Corporate Office, Block-01,
P.O. Neyveli, PIN: 607 801,
CuddaloreDistt., Tamil Nadu State.
 118. The Deputy General Manager,
Neyveli Lignite Corporation Ltd.,
Corporate Office, Block-01,
P.O. Neyveli, PIN: 607 801,
Cuddalore Dist., Tamil Nadu State.
 119. The Deputy General Manager,
Neyveli Lignite Corporation Ltd.,
Corporate Office, Block-01,
P.O.Neyveli, PIN: 607 801,
Cuddalore Dist., Tamil Nadu State.
 120. The Deputy General Manager,
Neyveli Lignite Corporation Ltd.,
Corporate Office, Block-01,
P.O.Neyveli, PIN: 607 801,
Cuddalore Dist., Tamil Nadu State.
 121. The Station Director,
Madras Atomic Power Station,
Nuclear Power Corpn.Of India Ltd.,
Kalpakkam – 603 102, Tamil Nadu State
 122. The Deputy General Manager,
Kaiga Generating Station,
Nuclear Power Corpn.of India Ltd.,
P.O.Kaiga, Via Karwar,
Karnataka - 581400 , Karnataka State.
 123. The Station Director,
Kudankulam Nuclear Power Project,
Nuclear Power Corporation of India Ltd.,
P.O. Kudankulam, RadhapuramTalukTirunelveli District,
Tamil Nadu - 627 106
 124. The Chief Operating Officer,
LANCO-Kondapalli Power Ltd.,
Plot No.4, Software Units Layout,
Hitech City, Madhapur,
Hyderabad-500 081. Andhra Pradesh State
 125. General Manager (O&M),

- NTPC Tamilnadu Energy Company Ltd.,
Vallur Thermal Power Project,
Vellivoyalchavadi P.O.,
Ponneri Taluk, Tiruvallur Dist.,
Chennai – 600103, Tamil Nadu State.
126. The General Manager (Projects),
Simhapuri Energy Pvt. Ltd.,
Madhucon Greenlands, 6-3-866/2,
3rd Floor, Begumpet,
Hyderabad-500016.
127. Sr. Vice President,
Meenakshi Energy Pvt. Ltd.,
Meenakshi, Plot No: 119,
Road No: 10, Jubilee Hills,
Hyderabad-500 033.
128. Managing Director,
Coastal Energen Pvt. Ltd,
7th Floor, Buhari Towers,
4 , Moores Road,
Chennai, PIN: 600006, Tamil Nadu State.
129. The Chief Executive Officer,
NLC Tamil nadu Limited,
2*500, MW JV Thermal Power Project,
Harbour Estate,
Tuticorin, PIN: 628004, Tamil Nadu State.
130. Thermal Power Tech Corporation India Limited,
SPSR Nellore, 6-3-1090,
A-Block, 5th Floor, TSR Towers,
Raj Bhavan Road, Somajiguda,
Hyderabad, 5000082.
131. Senior General Manager,
IL & FS Tamilnadu Power Company limited,
C. Pudhupettai post,
Parangipettai(via), Chidambaram(tk.),
Cuddalore-608502, Tamil Nadu.
132. General Manager,
Sembcorp Gayatri Power Ltd.,
TP Gudur Mandal,
Nellore-524344, Andhra Pradesh.

North Eastern Region

133. State Load Despatch Centre,
Agartala, 79 Tilla,
Kunjaban, Agartala,
Tripura (West)
134. Department of Power,
Government of Nagaland, SLDC Nagaland,
Electricity Colony,
Full Nagarjan Dimapur, Nagaland
135. Mizoram State Load Despatch Centre,
Tuikhuahtlang, Aizawl -796001
136. State Load Despatch Centre,
Assam, SLDC, AEGCL,
Near 132kv Grid Sub Station,
Kahilipara, Guwahati
137. General Manager,
Doyang HEP, NEEPCO,
Wokha, Nagaland
138. General Manager,
Ranganadi HEP, NEEPCO,
P.O. Ranganadi Proj. Dist. Subansiri,
Ar. Pradesh-791121
139. General Manager,
AGBPP, NEEPCO,
Kathalguri, Tinsukia, Assam
140. General Manager,
AGTPP, NEEPCO,
Ramchandranagar, Agartala, Tripura
141. General Manager,
KHANDONG HEP, NEEPCO,
Umrangsoo, N.C.Hills, Assam
142. General Manager,
KOPILI HEP, NEEPCO,
Umrangsoo, N.C.Hills, Assam
143. General Manager,
KOPILI-2 HEP, NEEPCO,
Umrangsoo, N.C.Hills, Assam

144. Chief Engineer,
NHPC
Loktak HEP Leimatak-795124, Manipur

145. Managing Director,
ONGC Tripura Power Company Ltd,
6th Floor, A Wing, IFCI Tower-61,
Nehru Place, New Delhi, 110019

146. General Manager,
Bongaigaon TPP, NTPC Ltd.,
P.O.-Salakati, Kokrajhar Dist.
Assam-783369

...Respondents

147. Member Secretary,
Northern Regional Power Committee
18-A, ShaheedJeet Singh Sasanwal Marg,
KatwariaSarai,
New Delhi-110 016

148. Member Secretary,
Southern Regional Power Committee
29, Race Course Cross Road,
Bangalore-560 009.

149. Member Secretary,
Eastern Regional Power Committee
14, Golf Club Road,
Kolkata-700 033

150. Member Secretary,
Western Regional Power Committee
F-3, MIDC Area,
Andheri (East),
Mumbai-400 093

151. Member Secretary,
North Eastern Regional Power Committee
NERPC Complex,
Dong Parmaw,
Lapalang,
Shillong-6

152. Chief Engineer (Grid Management),
Central Electricity Authority Sewa Bhawan,
R.K.Puram,
New Delhi-110 022.

Parties Present: Shri S.R. Narasimhan, NLDC
Shri U.K. Verma, NLDC
Shri N. Nallarasan, NLDC
Shri Ashok Rajan, NLDC
Shri Phanisankar Chilakuri, NLDC
Shri Umesh Ambati, NTPC
Shri V.K.Jain, NTPC
Shri Somes Bandyopadhyay, NTPC
Shri Rahul Srivastava, Advocate, SLDC, UP
Shri Zahir Ahmad, SLDC, UP
Shri M.K. Deepanker, SLDC, UP
Shri Vikram Singh, CEA

ORDER

The Petitioner is M/s Power System Operation Corporation Limited (POSOCO), the-National Load Despatch Centre (hereinafter referred as “NLDC”). The Commission has vide its Order dated 13.10.2015 in petition no 11/SM/2015 paved the way forward for operationalizing generation reserves in the country. The Commission directed NLDC to submit a detailed procedure in this regard.

2. The Respondent No. 1 is National Thermal Power Corporation (hereinafter referred as “NTPC”). . Proximity of NTPC generating station at Dadri to NLDC along with its high variable charges, were important reasons for choosing this plant for AGC pilot project.
3. The Respondent No. 2 is M/s NLC India Limited (hereinafter referred as “NLCIL”). NLCIL has filed the reply in compliance to the direction of the Commission as per Record of Proceedings of hearing held on 18.07.2017.
4. The Respondent No. 3 is UPState Load Despatch Centre (hereinafter referred as “UPSLDC”). UPSLDC has filed the reply in compliance to the direction of the Commission as per Record of Proceedings of hearing held on 18.07.2017.

5. As directed by the Commission, the Petitioner has filed the compliance by way of a petition in which it has prayed as under for approval of the Commission:
- i. Commissioning of AGC Pilot Project between NLDC and NTPC Dadri Stage-II.
 - ii. The procedure for accounting & settlement of the payments in respect of AGC services as outlined in the petition.
 - iii. Similar pilot projects to be taken up by POSOCO, in at least one other regional grid of the country.
 - iv. Issue of necessary directions for extending optical fibre connectivity to maximum number of power plants under the control area jurisdiction of RLDCs so that technical feasibility for participation of more generating stations under AGC is created.
 - v. Pass any other orders as the Commission may deem fit and proper under the facts and circumstances of the present case and in the interest of Justice.

Brief facts of the case:

6. Vide order dated 13.10.2015, the Commission in petition no. 11/SM/2015 gave a roadmap for operationalization of generation reserves in the country and directed NLDC/POSOCO to submit a detailed procedure to operationalize reserves in the country.
7. On 15.12.2015, POSOCO proposed to take up a pilot project with one of the NTPC plants in a region based on which further activities could be taken up.
8. On 19.01.2016 and 20.01.2016, POSOCO organized a two day discussion-cum-brainstorming session on implementation of AGC in Indian power system at New Delhi.
9. On 05.02.2016, the Commission advised POSOCO to submit the draft detailed procedure and implementation plan for operationalization of reserves within three months of implementation of Ancillary Services Regulations.

10. On 02.03.2016, the summary of the discussion-cum-brainstorming session was communicated to the members of the Forum of Load Despatchers (FOLD) in its 16th meeting.
11. On 15.03.2016, the summary of the discussion-cum-brainstorming meeting, along with the short term action points were communicated to Commission.
12. On 16.05.2016, a team from POSOCO, POWERGRID and M/s Siemens visited NTPC Dadri to explore the ground level requirements/issues (if any) in the implementation of Automatic Generation Control (AGC) at NTPC Dadri as a pilot project.
13. On 03.10.2016, AGC Pilot Project was discussed with SRPC constituents during a workshop on AGC at Southern Region Load Despatch Centre, Bangalore.
14. On 17.11.2016, a detailed half year analysis and feedback on Reserve Regulation Ancillary Services (RRAS) implementation in Indian Grid covering implementation aspects and challenges was submitted for perusal of the Commission.
15. On 18.11.2016, Letter of Award (LOA) was issued to M/S Siemens to start the execution of the AGC pilot project.
16. On 09.02.2017 and 10.02.2017, Western Regional Power Committee (WRPC) and POSOCO discussed the AGC Pilot project as an agenda item in the 2-day workshop at Mumbai.
17. On 24.02.2017 and 25.02.2017 a presentation was made by NLDC at Southern Regional Power Committee (SRPC) Board Meeting on the topic of AGC.
18. On 10.03.2017, a presentation was made by POSOCO before the Commission on the frequency profile of India, operationalization of reserves in the country as per the CERC Order dated 13.10.2015 and related aspects of AGC Pilot Project.
19. On 17.03.2017, a discussion on the proposed payment mechanism and related aspects of AGC Pilot Project was held with NTPC at NLDC.

20. On 21.04.2017, the instant Petition was filed with the Commission.
21. On 29.06.2017, the Petitioner conducted a mock test at NTPC Dadri Stage-II and observed that the unit has followed the signals given by NLDC.
22. On 14.07.2017, POSOCO submitted the detailed procedure on Operationalization of Spinning Reserve.

Submission of the Petitioner:

23. The Petitioner has submitted that the Commission vide Order dated 13.10.2015 in petition no 11/SM/2015 has given a roadmap for operationalization of generation reserves in the country. The objective of the Order was to provide a vision to introduce Spinning Reserves in the country, which is one of the important components for ensuring grid security, quality and reliability by achieving adequacy of supply and maintaining load-generation balance. It was envisaged by the Order that each region should maintain primary, secondary and tertiary reserves. All the generating stations that are regional entities must plan to operationalize Automatic Generation Control (AGC) alongwith reliable telemetry and communication by 01.04.2017. The Commission also noted that this would entail a one-time expense for the generators to install requisite software and firmware, which could be compensated for and that the communication infrastructure must be planned by the Central Transmission Utility (CTU) and developed in parallel, in a cost-effective manner.
24. The Commission directed NLDC/POSOCO to submit a detailed procedure to operationalize reserves in the country vide Order dated 13.10.2015. An outline procedure was submitted by POSOCO vide letter dated 15.12.2015. In the outline procedure, POSOCO proposed to take up a pilot project with one of the NTPC plants in a region based on which further activities could be taken up. On 05.02.2016, POSOCO was advised to submit the draft detailed procedure and implementation plan for operationalization of reserves within three months of implementation of Ancillary Services Regulations.
25. POSOCO had organized a two day discussion-cum-brainstorming session on implementation of AGC in Indian power system at New Delhi on 19th and 20th January 2016. Representatives

from CERC, CEA, POWERGRID, NTPC and POSOCO participated in the above meeting. Professor Anjan Bose, Professor, Washington State University, USA was also available as an expert during this workshop. While four SCADA vendors were also invited to demonstrate the functionality of their AGC software, three vendors presented the details of their software. As a broad area of convergence after the two day session, a pilot project in each region was agreed to be initiated to cover coal fired, gas based stations and storage hydro power stations. It was also discussed and agreed that generic technical specification should also be finalized under the proposed pilot project. Accordingly, summary of the discussion-cum-brainstorming meeting, along with the short term action points were communicated to the Commission vide letter dated 15th March 2016. The summary of the discussion-cum-brainstorming session was communicated to the members of the Forum of Load Despatchers (FOLD) in its 16th meeting held on 2nd March 2016. This was welcomed by the FOLD members.

26. From the interactions with national and international experts on power systems and experience with Ancillary Services till date, the general understanding of POSOCO was that different solutions as a package like Load and Renewable Energy (RE) generation forecast, proper portfolio management by the States, primary response from the generators, secondary control in the form of AGC, Ancillary Service products in different time frames etc. are needed for stable frequency operation of the power system. It was agreed that no unique solution exists. A bad or no forecast of load/RE generation and poor portfolio management by the State utilities would lead to heavy deviations from schedule and grid indiscipline exhausting all reserves in the system and making the system insecure. Effectiveness of Automatic Generation Control (AGC) would have to be seen in this overall context. AGC Pilot Project is one of the steps in that direction for stable frequency operation and security of the grid. Since this pilot project is being implemented on just two units with very little spinning reserve to start with, the pilot AGC may not exert any control on the 150 GW large Indian power system. However, the response of the generator for variation in Area Control Error (ACE) due to deviations in tie line flows of Northern Region (NR) and frequency was observed in the pilot project. Valuable experience can be gained in terms of implementation aspects, communication protocols, generator regulation and load following capabilities, cyber security etc. which will be useful during implementation of secondary control on a large scale.

27. During the discussion with NTPC representatives in the above said meeting, NTPC Dadri stage-II was suggested by them for implementation of the first AGC pilot project keeping in view the following:
- i. Dadri Stage II power plant is located near NLDC, New Delhi.
 - ii. Ease in monitoring the field level implementation process.
 - iii. The variable cost of the power plant is higher than other thermal plants in Northern Region under RLDC jurisdiction, being a load centre plant. Hence it is easy to keep Spinning Reserves in the same. The only thermal plants in NR costlier than Dadri Stg –II are DadriStg-I and Jhajjar. Other costlier plants (other than thermal) are all Gas based stations, which might be considered for reserves subsequently.
28. Accordingly, a team from POSOCO, POWERGRID and M/s Siemens visited NTPC Dadri on 6th May 2016 to explore the ground level requirements/issues (if any) in the implementation of Automatic Generation Control (AGC) at NTPC Dadri as a pilot project. Representatives from NTPC demonstrated the existing plant level control system and also discussed the requirements at plant level.
29. The proposed AGC pilot project shall be operated from NLDC/RLDC along with the required hardware and software to be installed at NLDC/RLDC and NTPC Dadri Stage II. From the experience of the brainstorming meetings, plant visit and internal discussions, detailed technical specifications of the pilot AGC project were prepared by POSOCO. The AGC software would be integrated with the existing SCADA system at NLDC/RLDC and data exchange would take place accordingly. Modelled generating station/units with the static and dynamic data will be configured along with the desired real-time data in the proposed AGC software. Phasor Measurement Units (PMUs) would be installed by NTPC separately on the generator terminals at Dadri Stage-II for monitoring the generator behaviour during different contingencies in the system.
30. Further, in discussions with NTPC, it was decided to place a combined award from POSOCO's side for works at both NLDC and NTPC Dadri end. NTPC would reimburse POSOCO the costs for its portion. Based on this finalised scope of works, bids were invited

from prospective vendors in October 2016 and M/S Siemens emerged as the successful bidder. Letter of Award (LOA) was issued to M/S Siemens on 18.01.2017 to start the execution of the AGC pilot project.

31. POSOCO would be separately approaching the Commission for approval of the expenditure incurred for the AGC pilot project.
32. The AGC Pilot project was also discussed in the meetings by WRPC and SRPC forums attended by POSOCO. AGC Pilot Project was discussed with SRPC constituents during a workshop on AGC dated 03.10.2016 at SRLDC, Bangalore. A presentation was made by NLDC at SRPC Board Meeting dated 24.02.2017 and 25.02.2017 on the topic of AGC. WRPC and POSOCO discussed the AGC Pilot project as an agenda item in the 2-day workshop from 09.02.2017 and 10.02.2017 at Mumbai.
33. A detailed half year analysis and feedback on Reserve Regulation Ancillary Services (RRAS) implementation in Indian Grid covering implementation aspects and, challenges was submitted by NLDC for perusal of the Commission on 17.11.2016. It was observed from the same that for Regulation 'Down', about Rs. 0.49/kWh has been retained by RRAS provider on an average in the period of six months. While for Regulation 'up' 50 paise/kWh is being paid to the RRAS provider as per the Orders of the Commission. This aspect becomes important while finalizing the settlement mechanism for plants under AGC outlined in the subsequent paragraphs.
34. While several methods exist worldwide for compensating generating stations providing secondary regulation services through AGC such as payments in terms of Rs./MW (considering opportunity costs), a simple method is required considering that the power plant being put under AGC is under the Commission's jurisdiction as far as tariff is concerned, its fixed cost liability is being shared by the beneficiaries and little opportunity cost is involved in bringing this plant under AGC.
35. To ensure the accounting and settlement of the energy and power under Automatic Generation Control (AGC) and continuous operation of the project, the Petitioner has proposed that:

- i. Energy produced due to AGC signals should be duly factored while working out the deviations from the schedule.
- ii. Aggregated AGC incremental MW signals over 15 minutes/5 minutes would be logged in MWh at NLDC/NRLDC and NTPC Dadri as AGC MWh. NTPC Dadri may send its AGC MWh account every week to NRLDC/NLDC.
- iii. AGC MWh logs would be forwarded to NRPC secretariat on weekly basis to NRPC through NRLDC.
- iv. Deviation in MWh for every 15-minute time block would be worked out as:-

$$\text{MWh deviation} = (\text{Actual MWh}) - (\text{Scheduled MWh}) - (\text{AGC MWh})$$

This would be settled as per the existing Deviation Settlement Mechanism (DSM) Regulations.
- v. For AGC MWh increase computed during every 15-minute time block, payment shall be made based on variable charges submitted to the NRPC by Dadri under RRAS Regulations. Payment would be made from the Northern Region DSM pool.
- vi. For AGC MWh reduction computed during a 15-minute time block, Dadri shall pay as per the same variable charges above to the NR DSM pool.
- vii. For AGC MWh computed for each 5-minute time block, 50 paise/kWh mark-up shall be payable to NTPC Dadri from NR DSM pool for both positive AGC MWh generation and negative AGC MWh reduction.
- viii. It is proposed to keep 50-100 MW Spinning Reserve at NTPC Dadri Stg-II units 5&6 combined to start with. The Commission may facilitate NRLDC/NRPC to earmark 50 MW up/down reserves at NTPC Dadri Stage-II on days when full generation is requisitioned or schedule is at technical minimum.

36. A presentation was made by POSOCO on 10.03.2017 before the Commission on the frequency profile of India, operationalization of the Commission reserves order dated 13.10.2015 and related aspects of AGC Pilot Project.

Submission of Respondent NTPC

37. The Respondent has not preferred to file any reply to the above petition.

Submission of Respondent NLCIL

38. The Respondent vide its reply dated 02.09.2017 has submitted that "Energy produced due to AGC signals should be duly factored while working out the deviations from the schedule." is a welcome aspect.
39. Logging of MW signals over 5 minutes in MWh would be possible only after up-gradation of the presently available metering system of 15 minute time blocks to 5 minute blocks.
40. The Respondent has further submitted that it has been envisaged that for AGC MWh reduction, the power station shall pay the corresponding variable charges to DSM Pool Account and that 50 paise mark-up would be payable from DSM pool for both positive AGC MWh generation and negative AGC MWh reduction. Therefore, it needs to be clarified whether the Fixed Cost of the Power Station will be borne by the MoP notified beneficiaries for the quantum of power earmarked as Spinning Reserve also or whether the same has to be met from Power System Development Fund.

Submission of Respondent UPSLDC

41. The Respondent has filed a formal reply on 21.09.2017.
42. The Respondent has also submitted that the contents of Para 7 of the petition is only based upon the assumption and presumption as it stated as "A bad or no forecast of load/ RE generation and poor portfolio management by the State Utilities would lead to heavy deviations from schedule and grid indiscipline exhausting all reserves in the system and making the system insecure". In view of the above, if the Commission may give directives to

the concerned Generating entities (like State owned Generating Stations, IPPs etc.) and UPPCL/Discoms, whose scheduling and despatch is being done by the SLDC.

Proceedings during hearings:

43. On 18.7.2017, the Learned counsel for Petitioner submitted that the present petition has been filed as per Commission's direction vide order dated 13.10.2015 in Petition No. 11/SM/2015. Vide the said Order it was held that all generating stations that are regional entities must plan to operationalize Automatic Generation Control (AGC) along with reliable telemetry and communication by 01.04.2017 and further directed NLDC/POSOCO to submit a detailed procedure to operationalize reserves in the country. The Petitioner submitted that it has conducted a mock test on 29.06.2017 at NTPC Dadri Stage-II and the unit followed the signals given by NLDC. The detailed modus-operandi has been filed for Operationalization of Spinning Reserves for the Commission's consideration. The Commission directed the Petitioner to upload the detailed modus operandi on Operationalization of Spinning Reserves on its website and seek comments from the stakeholders by 11.08.2017.
44. Last hearing in the petition was held on 21.11.2017 during which Learned counsel for Petitioner submitted that a team of CERC officials visited Dadri station to witness the operation of the AGC. It was submitted that the units of Dadri Thermal station put under the AGC followed the AGC signal thereby increasing/decreasing generation depending upon the system frequency. After hearing the parties present, the Commission reserved the order in the petition.

Analysis & Decision:

45. The most important responsibility of the Power System operators is to maintain reliability of the Power System. The maintenance of Load - Generation balance is one important aspect of reliability. It has been long acknowledged that for a large complex grid such as the Indian grid, primary, secondary and tertiary frequency control are must-have tools to ensure reliability.
46. The Commission notified the Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015 on 13.08.2015. The regulations provided for utilization of

URS (un-requisitioned surplus) of Central Generating Stations, effectively providing tertiary frequency control. Ancillary Services were operationalized in April 2016 by POSOCO, along with the RLDCs, and over year and a half, these have proved instrumental in further narrowing the frequency band of operation.

47. Automatic Generation Control (AGC) is essential for providing secondary frequency response. With the objective for ensuring grid security, quality and reliability by achieving adequacy of supply and maintaining load-generation balance, the Commission vide Order dated 13.10.2015 in Petition no 11/SM/2015 gave a roadmap for operationalization of generation reserves in the country. It was envisaged by the Order that each region should maintain primary, secondary and tertiary reserves. All the generating stations that are regional entities must plan to operationalize Automatic Generation Control (AGC) alongwith reliable telemetry and communication by 01.04.2017. The Commission directed NLDC/POSOCO to submit a detailed procedure to operationalize reserves in the country vide Order dated 13.10.2015. An outline procedure was submitted by POSOCO vide letter dated 15.12.2015. In the outline procedure, POSOCO proposed to take up a pilot project with one of the NTPC plants in a region based on which further activities could be taken up. On 05.02.2016, POSOCO was advised to submit the draft detailed procedure and implementation plan for operationalization of Reserves within three months of implementation of Ancillary Services Regulations. At the very onset the Commission appreciates the efforts under-taken by NLDC and NTPC for making a pathway for the introduction of the Spinning Reserves in the country by planning and implementing the AGC pilot project. The National Electricity Policy (NEP) mandates that adequate reserves may be maintained to ensure secure grid operation. The collective efforts of the stakeholders in implementation of the Automatic Generation Control are a step forward and will go a long-way in development of the secondary reserves in the country leading to stable frequency operation and Grid security and reliability leading to greater Grid Discipline.
48. NLDC had organized discussion-cum-brainstorming session on implementation of AGC in Indian power system in which there was a highly focussed interaction with national and international experts on power systems and experience with Ancillary Services till date. The general understanding was that different solutions as a package like load and Renewable Energy (RE) generation forecast, proper portfolio management by the States, primary

response from the generators, secondary control in the form of AGC, Ancillary Service products in different time frames etc. are needed for stable frequency operation of the power system. No unique solution exists. AGC Pilot Project is a step in the direction of stable frequency operation and Grid security. NTPC Dadri stage-II was considered for implementation of the first AGC pilot project keeping in view its location, ease in monitoring the field level implementation process and higher variable cost leading to greater possibility of un-requisitioned reserves. Based on this finalised scope of work, bids were invited from prospective vendors in October 2016 and M/S Siemens emerged as the successful bidder. Letter of Award (LOA) was issued to M/S Siemens on 18.01.2017 to start the execution of the AGC pilot project.

49. The Petitioner has filed the petition for the purpose inter-alia to ensure the accounting and settlement of the energy and power under Automatic Generation Control (AGC) and continuous operation of the project. The Petitioner wishes to approach the Commission separately for approval of the expenditure incurred for the AGC pilot project.

50. The Petitioner has proposed that:
 - i. Energy produced due to AGC signals should be duly factored while working out the deviations from the schedule.

 - ii. Aggregated AGC incremental MW signals over 15 minutes/5 minutes would be logged in MWh at NLDC/NRLDC and NTPC Dadri as AGC MWh. NTPC Dadri may send its AGC MWh account every week to NRLDC/NLDC.

 - iii. AGC MWh logs would be forwarded to NRPC secretariat on weekly basis through NRLDC.

 - iv. Deviation in MWh for every 15-minute time block would be worked out as:-MWh deviation = (Actual MWh)-(Scheduled MWh)-(AGC MWh). This would be settled as per the existing Deviation Settlement Mechanism (DSM) Regulations.

- v. For AGC MWh increase computed during every 15-minute time block, payment shall be made based on variable charges submitted to the NRPC by Dadri under RRAS Regulations. Payment would be made from the Northern Region DSM pool.
 - vi. For AGC MWh reduction computed during a 15-minute time block, Dadri shall pay as per the same variable charges above to the NR DSM pool.
 - vii. For AGC MWh computed for each 5-minute time block, 50 paise/kWh mark-up shall be payable to NTPC Dadri from NR DSM pool for both positive AGC MWh generation and negative AGC MWh reduction.
 - viii. It is proposed to keep 50-100 MW Spinning Reserve at NTPC Dadri Stg-II units 5&6 combined to start with. The Commission may facilitate NRLDC/NRPC to earmark 50 MW up/down reserves at NTPC Dadri Stage-II on days when full generation is requisitioned or schedule is at technical minimum.
51. Respondent No.2 has submitted that logging of MW signals over 5 minutes in MWh would be possible only after up-gradation of the presently available metering system of 15 minute time blocks to 5 minute blocks. The Respondent has further submitted that it needs to be clarified whether the Fixed Cost of the Power Station will be borne by the MoP notified beneficiaries for the quantum of power ear-marked as Spinning Reserves also or whether the same has to be met from Power System Development Fund. Respondent No.3 has also submitted that the petition is only based upon the assumption and presumption as it stated that “A bad or no forecast of load/ RE generation and poor portfolio management by the State Utilities would lead to heavy deviations from schedule and grid indiscipline exhausting all reserves in the system and making the system insecure”. In view of the above, the Commission may give directives to the concerned Generating entities (like State owned Generating Stations, IPPs etc.) and UPPCL/Discoms, whose scheduling and despatch is being done by the SLDC.
52. From the submissions of the parties, the following issues arise before this Commission:

- a) **Issue No. 1:** *Whether log of Aggregated AGC incremental MW signals over 15 minutes captures the correct scenario for settlement or alternatively log of Aggregated AGC incremental MW signals over 5 minutes should be maintained? Further, would it be possible to monitor AGC incremental MW signals over 5 minutes only after up-gradation of the presently available metering system of 15 minute time blocks to 5 minute blocks?*
- b) **Issue No. 2:** *Whether there is any rationale for incentive by way of 50 paise/kWh mark-up for AGC MWh from NR DSM pool for both positive AGC MWh generation and negative AGC MWh reduction?*
- c) **Issue No.3:** *Whether the deviation in MWh for every 15-minute time block, may be worked out as: $MWh\ deviation = (Actual\ MWh) - (scheduled\ MWh) - (AGC\ MWh)$ and the same should be settled as per the existing Deviation Settlement Mechanism (DSM) Regulations?*
- d) **Issue No. 4:** *Whether the Fixed Cost of the Power Station will be borne by the beneficiaries for the quantum of power earmarked as Spinning Reserve also or whether the same has to be met from Power System Development Fund?*
- e) **Issue No. 5:** *Whether the Petitioner's proposal to earmark 50 MW up/down reserves at NTPC Dadri Stage-II on days when full generation is requisitioned or schedule is acceptable?*

53. We now examine these issues one by one:

54. **Issue No. 1:** *Whether log of Aggregated AGC incremental MW signals over 15 minutes captures the correct scenario for settlement or alternatively log of Aggregated AGC incremental MW signals over 5 minutes should be maintained? Further, would it be possible to monitor AGC incremental MW signals over 5 minutes only after up-gradation of the presently available metering system of 15 minute time blocks to 5 minute blocks?*

55. The Petitioner has submitted that Aggregated AGC incremental MW signals over 15 minutes/5 minutes would be logged in MWh by the Petitioner and the Respondent. Respondent may then send its AGC MWh account every week to the Petitioner. However, Respondent No.2 has submitted that logging of MW signals over 5 minutes in MWh would be possible only after up-gradation of the presently available metering system of 15 minute time blocks to 5 minute blocks.
56. The Commission observes that the SLDCs/RLDCs are mandated by the Electricity Act to keep account of the quantity of electricity transmitted through the State/Regional Grid. The State Grids are synchronously connected with the Regional Grids in India. The five regional grids also have been synchronously connected to form the National Grid. Open Access in transmission and physical integration of the State and National Grids enabled the market players to trade electricity seamlessly. Thus, the electricity markets in India have been integrated. Energy Accounting is a pre-requisite to financial settlement of energy exchanges within the grid. Energy Accounting is a post facto activity. It is observed that one 15-minute time block can be assumed to consist of three 5-minute sub-blocks. It may happen that one positive AGC MWh generation in a sub-block may be followed by negative AGC MWh reduction in the next sub-block but within the same 15-minute time block. In such a case, energy accounting on a 15-minute time horizon will only report net of the positive/negative values and hence fail to capture the real AGC support provided by the plant.
57. The Commission observes that as per Minutes of the Third Technical Committee Meeting for “Implementation of Framework for Renewables at State Level”, held under chairmanship of Mr. A. S Bakshi, Member, CERC on 10th February 2016, it was proposed that:
- “It was also proposed that India should adopt a 5 minute settlement period instead of 15 minutes for better granularity and ramp monitoring.”*
58. From the above the Commission observes that an energy settlement system based on 5-minute time block is likely to bring in better granularity in grid management and ramp monitoring. However, as per existing energy settlement system, procedure of log records is based on 15 minutes time block. The only proposition which remains to be understood is whether any infrastructure is presently available in the industry which may be able to capture

the log records on 5-minute time block level for the specific power project. The question was well addressed in the hearing of the petition held on 21.11.2017. It was apprised by the Petitioner that its SCADA software is enabled with the feature of recording and integrating AGC signal for every 5 minute block. Respondent NTPC has also verified that records/logs for every 5 minute block are available at Dadri Units. As such, after due validation of data at both ends, the same can be used for the purpose of mark-up payment for AGC up/down generation. Therefore, it is concluded that 5-minute accounting is possible for this project, and the same should be implemented for improved record of AGC signal and the up/down response of the plant. This data will be utilized for settlement purposes for the pilot. While the mark-up shall be paid based on 5-minute energy records, payment of energy charges (paid by/to the DSM pool) and settlement of deviation charges with the DSM pool shall continue on the basis of 15-minute time-block.

59. *Issue No. 2: Whether there is any rationale for incentive by the way of 50 paise/kWh mark-up for AGC MWh from NR DSM pool for both positive AGC MWh generation and negative AGC MWh reduction?*
60. The Petitioner has submitted that a detailed half year analysis and feedback on Reserve Regulation Ancillary Services (RRAS) implementation in Indian Grid covering implementation aspects and challenges was submitted by NLDC for perusal of the Commission on 17.11.2016. It was observed from the same that for Regulation 'Down', about Rs. 0.49/kWh unit has been retained by RRAS provider on an average over a period of six months. While for Regulation 'up' Rs. 0.50/kWh is being paid to the RRAS provider as per the Orders of the Commission. This aspect becomes important while finalizing the settlement mechanism for plants under AGC outlined in the subsequent paragraphs. The Petitioner has proposed that for AGC MWh computed for each 5-minute time block, Rs. 0.50/kWh mark-up shall be payable to NTPC Dadri from NR DSM pool for both positive AGC MWh generation and negative AGC MWh reduction.
61. The Commission further observes that in the Order No. 01/SM/2016 dated 29.02.2016 in the matter of "Determination of mark-up for delivery of Regulation Up Services, under Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015", the Commission has observed that

“Based on the above rationale, the Commission sets the mark-up for participation in Regulation Up Ancillary Services at 50 paise/kWh. Based on the experience gained, the Commission will review the mark-up in six months”

62. The Commission observes that for Regulation Down, Regulation 13.5 of the Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015 stipulates as under:

“13.5.For Regulation Down service, the RRAS Provider(s) shall pay back 75% of the variable charges corresponding to the quantum of Regulation Down services scheduled, to the Regional Deviation Pool Account Fund.”

63. From the above the Commission observes that for participation in Regulation Up Ancillary Services, 50 paise/kWh mark-up has already been allowed and for participation in Regulation Down Ancillary Services, 25% of variable charges has already been allowed to be retained by a generator. In the petition, NLDC has mentioned that average mark-up for a period of 6 months for Regulation Down was about 49p/kWh. Thus, it is evident that it is almost the same as the mark-up already notified for Regulation Up services.
64. Since, the generating plant through AGC will be providing service similar to RRAS of up/down generation, AGC shall have similar framework for compensation as RRAS, composed of energy charges and mark-up or incentive. For Up service, energy charges shall be paid to the generator along with Rs.0.50/kWh mark-up, from the Regional Deviation Pool Account Fund or the DSM Pool. For the energy under AGC down service, the generator shall refund the energy charges to the DSM Pool. Additionally, instead of retaining part of variable charges as incentive under RRAS, the same mark-up of Rs. 0.50/kWh shall be paid from the Regional Deviation Pool Account Fund. As such, the Petitioner’s proposal on 50paise/unit being the mark-up for both Up/Down service is accepted.
65. **Issue No.3:** *Whether the deviation in MWh for every 15-minute time block, may be worked out as: $MWh\ deviation = (Actual\ MWh) - (scheduled\ MWh) - (AGC\ MWh)$ and the same should be settled as per the existing Deviation Settlement Mechanism (DSM) Regulations?*

66. The Petitioner has proposed that Deviation in MWh for every 15-minute time block would be worked out as follows: $MWh \text{ deviation} = (\text{Actual MWh}) - (\text{Scheduled MWh}) - (\text{AGC MWh})$. This would be settled as per the existing Deviation Settlement Mechanism (DSM) Regulations.

67. As per CERC Deviation Settlement Mechanism (DSM) Regulations, deviation in a time-block for a seller means its total actual injection minus its total scheduled generation. For regional entities, this deviation is settled as per the DSM price vector as prescribed in the regulations.

68. Additionally, Regulation 9 of Ancillary Services Regulations outlines how the dispatch takes place:

“9.3 The schedules of the RRAS Provider(s) shall be considered as revised by the quantum scheduled by the Nodal Agency under RRAS.”

This is done to ensure that the generator does not have to pay deviation charges to the extent of quantum dispatched under RRAS (up or down). Similar framework to the extent of ensuring that the generator does not have to pay deviation charges to the extent of quantum dispatched under AGC (up or down) shall apply to this case, without revising the schedule as in the case of RRAS. Accordingly, as the generator is providing a service, the quantum of AGC generation shall be excluded while determining inadvertent deviation MWh to compute corresponding DSM charges.

69. Therefore, the Commission approves the methodology as suggested by the Petitioner, that: AGC quantum shall be excluded for computing deviation MWh, which shall be settled as per DSM Regulations:

$MWh \text{ deviation} = (\text{Actual MWh}) - (\text{Scheduled MWh}) - (\text{AGC MWh})$.

70. **Issue No. 4:** *Whether the Fixed Cost of the Power Station will be borne by the beneficiaries for the quantum of power earmarked as Spinning Reserve also or whether the same has to be met from Power System Development Fund?*

71. The Petitioner has submitted that the plant's fixed cost liability is being shared by the beneficiaries and little opportunity cost is involved in bringing this plant under AGC.

However, Respondent NLCIL has submitted that it needs to be clarified whether the Fixed Cost of the Power Station will be borne by the MoP notified beneficiaries for the quantum of power ear-marked as Spinning Reserve also or whether the same has to be met from Power System Development Fund.

72. The Commission observes that for Regulation Down, Regulation 13.1 of the Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015 stipulates as under:

“RRAS Settlement

13.1. The concerned RPC, using block wise schedules given by concerned RLDC on weekly basis, shall compute and furnish the following details along with the DSM Account under separate account head of RRAS:

a) Fixed and variable charges payable to RRAS providers from the pool in case of UP Regulation

b) Variable charges payable by RRAS providers to the pool in case of DOWN regulation

c) Mark up as specified by CERC through a separate order

d) Fixed charges to be reimbursed by RRAS providers to the original beneficiaries”

73. From the above, the Commission observes that as per existing RRAS regulations, the fixed charges and the variable charges are payable to RRAS providers from the DSM pool in case of UP Regulation. Further, the Mark up as specified by the Commission is additionally paid from the DSM pool. In case of DOWN regulation, only the variable charges are payable by RRAS providers to the DSM pool (excluding 25% of variable charges that is retained as incentive). Additionally, in case of RRAS UP regulation, the fixed charges are then reimbursed by RRAS providers to the original beneficiaries.

74. In general the framework as applicable to RRAS should apply for AGC as the service provided by both is similar, as already noted. However, it must be noted that this was a first step towards Ancillary Services in the country, and the Commission felt that refunding fixed charges to the beneficiary(ies) while providing mark-up to the generators would provide incentive to both the parties. In the six-month feedback report, POSOCO has reported that: “Inclusion of the fixed charges in the payments is indirectly distorting merit order also.....This market design has created a perverse incentive for State Utility to take a passive approach and keep reserves on bar.....The beneficiary gets a refund of fixed charges despite a passive approach. Hence, the provision regarding refund of fixed charges needs to be reviewed.”
75. Considering the above learning from the Ancillary Services mechanism, the Commission is inclined to exclude fixed cost payment for AGC. It must be underscored that the beneficiary retains the right to schedule its share at any time (including the right to recall as per the provisions of IEGC), and that only the un-requisitioned surplus is being utilized under RRAS or AGC. Thus, it does not impact the rights of the beneficiaries in any way. At the same time, the generator gets the fixed cost from one source or the other (either from the beneficiary or from the DSM Pool). The payment of variable cost compensates the generator for the energy generated, while the mark-up seeks to compensate for any additional maintenance/wear & tear incurred due to cycling of the plant. In case of AGC MWh reduction in a time-block, the generator shall be paid the mark-up while it will pay the variable charges corresponding to the quantum back to the DSM pool.
76. The Commission accepts the proposal of the Petitioner that the fixed cost shall continue to be paid by the beneficiaries while the generator shall be paid a mark-up at 50p/unit for both positive AGC MWh generation and negative AGC MWh reduction from the DSM Pool. Generator shall be paid variable charges (as submitted under RRAS) from the DSM Pool for quantum of energy generated (positive AGC) and the same shall be paid by the generator to the DSM Pool for energy reduced (negative AGC).
77. *Issue No. 5: Whether the Petitioner proposal to earmark 50 MW up/down reserves at NTPC Dadri Stage-II on days when full generation is requisitioned or schedule is at technical minimum, is acceptable?*

78. The Petitioner has proposed to keep 50-100 MW Spinning Reserve at NTPC Dadri Stage-II units 5&6 combined to start with. The Petitioner has submitted that the Commission may facilitate NRLDC/NRPC to earmark 50 MW up/down reserves at NTPC Dadri Stage-II on days when full generation is requisitioned or schedule is at technical minimum.
79. The Commission observes that existing Ancillary Services Regulations as well as the AGC procedures as discussed above only schedule un-requisitioned surplus available at the generating station(s). The beneficiary(ies) retain the first right with respect to scheduling its share(s). The Petitioner is recommending setting aside a definitive quantum of reserves even if the generating station has received full requisition. It is observed that in such a case if the beneficiary schedules the power but does not receive it due to setting aside for reserves, then an equitable commercial mechanism will need to be prepared and examined within the provisions of existing contracts. The beneficiary is bearing the fixed cost liability and hence has full right to requisition its share. A new market framework that adequately addresses these aspects needs to be evolved after detailed stakeholder consultations, and cannot be addressed by way of the present petition. Hence, ear-marking reserves at the time of full requisition is not feasible in the present scenario and needs further deliberations. So is the case of regulation down when the schedule is at technical minimum. This cannot be agreed without a wider consultation and without examining the technical impact on plant operation in the event of the plant going below technical minimum. As such, the Commission approves at this stage the framework of utilisation of only the un-requisitioned surplus subject to technical minimum, for the purpose of AGC.

To sum up, the decisions are as follows:

80. The Commission feels that the implementation of the AGC pilot project is a way forward in the direction of having adequate reserves to ensure secure grid operation as also mandated by the National Electricity Policy. The Commission acknowledges and appreciates the efforts undertaken by NLDC and NTPC for implementation of this AGC pilot project. The development of secondary reserves in the country will lead to grid security and reliability. The Commission is pleased to approve the Commissioning of the AGC Pilot Project between NLDC and NTPC Dadri Stage-II.

81. **Issue No. 1:** The Commission finds that 5-minute accounting is possible for this project, and directs that the same should be implemented for improved record of AGC signal and the up/down response of the plant. This data will also be utilized for payment purposes for the mark-up. Settlement of energy charges and deviation charges shall continue to be on the basis of 15-minute time block.
82. **Issue No. 2:** The Commission accepts the Petitioner's proposal that 50p/unit shall be the mark-up for both positive AGC generation and negative AGC reduction.
83. **Issue No. 3:** Quantum (MWh) provided under AGC shall be deducted to arrive at the net deviation as follows:
Net MWh deviation = (Actual MWh)-(Scheduled MWh)-(AGC MWh). The generator shall pay deviation charges as per the DSM Regulations according to this computation.
84. **Issue No. 4:** The Commission accepts the proposal of the Petitioner that the fixed cost shall continue to be paid by the beneficiaries while the generator shall be paid a mark-up at 50p/unit for both positive AGC MWh generation and negative AGC MWh reduction. Generator shall be paid variable charges (as submitted under RRAS) from the DSM Pool for quantum of energy generated (positive AGC) and the same shall be paid by the generator to the DSM Pool for energy reduced (negative AGC).
85. **Issue No. 5:** The Commission is of the view that on days when full capacity is requisitioned, ear-marking a quantum of reserves might not be feasible at this juncture and needs to be further deliberated with stakeholders. Similarly, the proposal of allowing regulation down when the schedule is at technical minimum is not agreed at this stage as it needs further examination in terms of technical feasibility and impact of going below technical minimum.
86. The Commission directs that similar pilot projects may be replicated by NLDC, in at least one other regional grid of the country.

87. The Commission would also advise the stakeholders to endeavour to extend optical fibre connectivity to maximum number of power plants under the control area jurisdiction of RLDCs so that technical feasibility for participation of more generating stations under AGC is created.
88. With the above directions, Petition No. 79/RC/2017 stands disposed of.

Sd/-

(Dr.M.K.Iyer)
Member

Sd/-

(A. S. Bakshi)
Member

Sd/-

(A. K. Singhal)
Member

Sd/-

(Gireesh B. Pradhan)
Chairperson