

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 11/SM/2021 (Suo-Motu)

Coram:

**Shri P.K. Pujari, Chairperson
Shri I.S. Jha, Member
Shri Arun Goyal, Member
Shri Pravas Kumar Singh, Member**

Date of Order: 27 of September 2021

In the matter of:

Extension of Pilot on Security Constrained Economic Dispatch (SCED)

ORDER

The Commission vide its suo motu Order dated 31st January 2019 in Petition No. 02/SM/2019, directed Power System Operation Corporation (POSOCO) to implement a pilot project on Security Constrained Economic Dispatch (SCED) w.e.f. 01.04.2019, for thermal Inter-State Generating Stations (ISGS).

2. Subsequently, the Commission extended the timeline of pilot project on SCED up to 31st March 2020 vide its order dated 11th September 2019 in Petition No. 08/SM/2019; up to 31st May, 2020 vide order dated 23rd March, 2020 in



Petition No. 01/SM/2020; up to 31st March, 2021 vide order dated 18th April 2020 in Petition No. 08/SM/2020; and up to 30th September 2021 vide order dated 31st March, 2021 in Petition No. 03/SM/2021.

3. The salient features of the SCED framework applicable till 30th September, 2021 are as under:

a. SCED pilot shall be open to all generating stations that are willing to participate, including the generating stations owned by the State and having capabilities to communicate with Regional Load Despatch Centres (RLDCs)/ National Load Despatch Centre (NLDC); generating stations whose scheduling is done by RLDCs; and State-embedded generating stations whose scheduling, metering, accounting and settlement is in place and whose scheduling related information exchange can be enabled through the SLDC interfacing with the concerned RLDC/ NLDC. Scheduling for those generators that are done through SLDC, shall continue to be done by the respective SLDC while increment/ decrement instructions under SCED shall be communicated from NLDC/ RLDCs to the respective SLDC.

b. The schedules of the States/ beneficiaries shall not be changed on account of SCED and the discoms/beneficiaries shall continue to pay the charges for the scheduled energy directly to the generator as per the existing practice. For any increment in the injection schedule of a generator due to SCED, the generator shall be paid from the National Pool Account (SCED) for the incremental generation at the rate of its variable charge. For any decrement in the schedule of a generator due to SCED, the generator shall pay to the aforesaid National Pool Account (SCED) for the decremental generation at the rate of its variable charge after discounting heat rate compensation due to part-load operation as certified by respective

Regional Power Committees (RPCs) in case of regional entities and appropriate authority in case of other generators

c. Any incremental change in schedule on account of optimization shall not be considered for incentive computation for the generating stations; deviation in respect of such generators shall be settled with reference to their revised schedule, and any increment or decrement of generation under the SCED shall not form part of RRAS.

d. Generators already participating in the SCED pilot shall continue to participate in the pilot. Other generators willing to participate in the extended period shall be required to provide a one-time consent for participation in the SCED pilot. Once the consent is communicated to POSOCO, it will be mandatory for the generator to participate in the SCED pilot for a minimum period of one month. Such generators shall declare their variable charge upfront, similar to the existing SCED generators participating in the pilot.

e. The generators shall declare their variable charge upfront to POSOCO, along with the technical, operational, and other parameters as required by NLDC/ RLDC/ RPCs.

f. Variable charge of generators other than the ISGS whose tariff is determined by the Commission shall be considered as under:

i. For generators having full capacity tied in multiple PPAs, the variable charge shall be considered as the weighted average of the variable charges, as determined or adopted by the Appropriate Commission.

ii. For generators having only part capacity tied in PPA(s), variable



charge shall be considered as the weighted average of the variable charges, as determined or adopted by the Appropriate Commission for the contracted portion of the capacity. This variable charge determined for the contracted capacity shall be considered for the untied portion of the capacity as well.

iii. For generators with no tied capacity (merchant generator), the variable charge shall be considered as intimated by such generator at least one week in advance to POSOCO. The generators shall be required to declare the variable charge on monthly basis.

g. The net savings after adjusting the compensation for part-load operation to the generators shall be shared among the beneficiaries and the participating generators as follows:

i. As a first step, the share towards 'untied capacity' of merchant generators as well as generators with part capacity tied shall be segregated from the net benefits, in the ratio of contribution of such generators to SCED, for every time block.

ii. The remaining benefits (after segregation as at step 'i' above) shall then be shared in the ratio of 50:50 between the generators (with tied capacity, participating in SCED) and the concerned beneficiaries/ Discoms, aggregated on a monthly basis as per Regional Energy Account (REA) and weekly SCED accounts. The benefits (50% of the remaining benefits after segregation as at step 'i' above) corresponding to the beneficiaries/ Discoms shall be shared in proportion to their final schedule from the generating stations covered under the SCED pilot.

iii. The benefit of generators with tied capacity (i.e. 50% of the



remaining benefits after segregation as at step 'i' above) shall be shared between SCED Up and SCED Down generators in the ratio of 60:40 for respective time blocks. In other words, 60% of the generator's benefit in a time block shall be shared among all the participating generators with tied capacity receiving SCED up signals in proportion to their SCED schedule. Similarly, 40% of the generator's benefit shall be shared among the participating generators with tied capacity receiving SCED down signals in proportion to their SCED schedule.

- iv. Based on the above, if a generator's share exceeds 7 paise/kWh the same shall be restricted to a ceiling of 7 paise/kWh and the gains over and above 7 paise/kWh shall be shared among Discoms in the same manner as at clause 'ii' above.
- v. Accordingly, the benefits for each time block shall be summed monthly for each generator participating in the SCED pilot, as per the Regional Energy Account (REA). This shall require that all accounts including heat rate compensation for part load operation are issued in a timely manner so as to facilitate smooth disbursement and settlement.
- vi. The cap of 7 paise/kWh shall, however, not be applicable in respect of 'untied capacity' of merchant generators as well as generators with part capacity tied for its untied capacity. The share of savings from SCED for generators with part capacity tied, shall be first settled in proportion to their contribution from tied capacity and then from untied capacities. The share in savings as segregated at step 'i' above in respect of such generators shall be the same for SCED up and SCED down i.e. the ratio of 60:40 as in the case of generators with

tied up capacity will not be applicable in this case. Hence, the allocations for merchant generators as segregated in the step at 'i' above, shall accrue to such generators as their final share. Similarly, for generators with part capacity tied, the allocation, as segregated in the first step 'i' above, proportionate to the untied capacity, shall accrue to such generators as their final share for the untied capacity.

h. The sharing mechanism explained in clause (g) shall apply subject to the following:

i. For Inter-State Generating Stations (ISGS) that are regional entities and whose tariff is determined or adopted by the Commission, the heat rate compensation for part-load operation shall be provided as per CERC (Indian Electricity Grid Code) Regulations, 2010 as amended from time to time.

ii. For generators with part capacity tied (whose PPAs have been approved by the Appropriate Commission), the heat rate compensation for part-load operation shall be provided as per CERC (Indian Electricity Grid Code) Regulations, 2010 as amended from time to time. The Station Heat Rate (SHR) to be used as a reference for this purpose shall be according to the provisions in the respective PPA(s) read with the relevant regulations of the Appropriate Commission.

iii. Generators with no tied capacities (merchant generators) shall not be eligible for any heat rate compensation for part-load operation.

i. Benefits received by the SCED generators would be summed up every month to estimate the cumulative benefit for each generator in a month. RPCs while preparing REA shall provide and settle monthly

benefits for each generator participating in the SCED pilot based on inputs from NLDC/RLDC. Further, POSOCO shall ensure the settlement of accounts as per the methodology with the help of RPCs and RLDCs.

4. As per the directions of the Commission, POSOCO submitted a detailed Feedback Report on Extended SCED pilot to the Commission on 20th September 2021.

5. According to the Report, 47 generating stations with 55,670 MW generation capacity are part of the SCED Pilot as on date. Three new ISGS generating units commissioned recently viz NPGC-660 MW, Tanda II -660 MW and Darlipali-800 MW with total capacity of 2120 MW have been incorporated in the SCED pilot. On the other hand, NTPC Lara (2x800 MW) withdrew temporarily from SCED w.e.f. 25th February 2021 due to technical reasons and NTPC Simhadri Stage 2 (2x500 MW) also withdrew temporarily from SCED w.e.f. 20th April 2021 citing planned overhauling.

6. It was reported that during January-August, 2021 the total reduction in variable cost of generation due to SCED was ₹ 249 Crores, with daily average saving of Rs 1.02 Crore. However, SCED resulted in ₹ 1847 crores worth of cumulative savings in generation cost on an all-India basis from the start of the SCED pilot in April 2019 till August, 2021.

Operational Experience

7. The report, in continuation with the previous feedback reports, highlights that in general, pit-head stations get SCED Up and mid-merit stations get both SCED Up and SCED Down with change in distribution in different seasons owing to different load generation scenarios and unit availabilities across regions in different months. During January-August 2021, generation in Southern Region has been decreased barring few blocks during solar peak while generation in northern region has been increased except during late evening peak hours. Western region generation is observed to move on both sides, getting SCED Up and SCED Down. Eastern region generation is incremented throughout the day while North-Eastern region generation is decremented throughout the day

8. The report highlighted that during April-May, 2021 due to second wave of Covid-19 pandemic there was reduction in all India demand, resulting in a corresponding reduction in DC on-bar as well as net schedule of SCED participating generator. The report highlights variation in the system marginal price (SMP) in the month of January and February 2021 due to large variation in demand whereas the month of April and May 2021 have seen reduction in SMP as a result of second wave of COVID-19 pandemic and again increase in the month of August with sustained high demand. The Report also highlighted the performance of SCED in extreme scenarios like cyclone Tauktae, originated in Arabian Sea, achieving greater economy by optimising regional demand.



9. The report has deliberated upon the SCED implementation at intra-state level and informed that necessary steps have been taken to operationalize the pilot at intra state level. The report also stated that the Security Constraint Unit Commitment (SCUC) simulation has been tested in off-line mode with incorporation of gas and hydro stations and better modelling and features.

10. The POSOCO in its report requested further extension of the SCED pilot and suitable framework to enable SCUC on pilot basis at the National level.

Analysis & Decision

11. The Commission reiterates that SCED has helped in gaining experience in the scope of optimisation at the ISGS level and has proved to be an important tool in optimising the available resources in the power system to reduce system cost.

12. The Commission notes the impact of second wave of Covid-19 pandemic had on the overall demand reduction and performance of SCED generators. The Commission also observes that the reduction in variable cost saving in SCED pilot during January-August, 2021, as compared to earlier period. However, the cumulative saving of ₹ 1847 Crores in generation cost from start of the SCED pilot in April 2019 up to September 2021 is significant.

13. The Commission also appreciates the efforts made by POSOCO on initiating pilot projects on SCED at intra-state level.



14. The Commission has perused the way forward as suggested by POSOCO in its detailed feedback report. The Commission reiterates that suggestions such as operationalization of SCUC and other such need detailed consultation with stakeholders and, in some cases, amendments to relevant regulations. The Commission is already in the process of addressing some of these issues and would take suitable action at an appropriate time by following the due regulatory process.

15. The Commission recognises the challenges faced in implementation of the expanded SCED pilot as a result of COVID-19 pandemic and is of view that it would be prudent to further extend the SCED pilot pending formalisation of suitable regulation based on the insights gained from the pilot on different aspects related to optimal scheduling and despatch across multiple market avenues.

Summary of Decisions:

16. In light of the above discussion, the Commission decides to extend the implementation of the SCED pilot till 31st March, 2022, on the same terms as contained in the order dated 18th April 2020 in Petition No. 08/SM/2020

17. POSOCO is also directed to apprise the Commission on the operation of the expanded SCED on monthly basis, so that the Commission can take regular review and carry out any modifications, as required. The Commission also



directs POSOCO to submit periodic detailed feedback report covering all the aspects of the pilot.

18. The petition No. 11/SM/2021 (suo motu) is disposed of in terms of the above directions.

Sd/-
[P. K. Singh]
MEMBER

Sd/-
[Arun Goyal]
MEMBER

Sd/-
[I. S. Jha]
MEMBER

Sd/-
[P.K Pujari]
CHAIRPERSON

