
केन्द्रीय विद्युत विनियामक आयोग
CENTRAL ELECTRICITY REGULATORY COMMISSION

नईदिल्ली
NEW DELHI

याचिका संख्या. / Petition No.: 08/SM/2020 (Suo-Motu)

कोरम /Coram:

श्री पी. के. पुजारी, अध्यक्ष / Shri P. K. Pujari, Chairperson

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आदेश दिनांक /Date of Order: 18th of April, 2020

In the matter of:

Extension and Expansion of Pilot on Security Constrained Economic Dispatch
(SCED)

आदेश / ORDER

The Commission vide its suo motu Order dated 31st January, 2019 on Petition No. 02/SM/2019, directed Power System Operation Corporation (POSOCO) to implement a pilot on Security Constrained Economic Dispatch (SCED) w.e.f. 01.04.2019, for thermal Inter-State Generating Stations pan India. The prime driver behind the pilot was to explore the scope of optimisation and, therefore, the possibility of minimising the system cost without major structural changes in the existing system.



2. Subsequently, the Commission extended the pilot on SCED vide its order on Petition No. 08/SM/2019 (suo motu) dated 11th September, 2019 up to 31st March, 2020. The Commission, in this order, directed that during the extended period (1st October onwards), the pilot shall be applicable to generating stations that are willing to participate in the pilot. In the order, based on the feedback in the interim report submitted by POSOCO on 19.08.2019, the Commission also gave directions regarding sharing of benefits accrued from SCED among generators and beneficiaries/ Discoms. Further, vide Petition No. 01/SM/2020 (suo motu) dated 23rd March, 2020, the Commission has extended implementation of the SCED pilot till 31st May, 2020.

3. The salient features of the SCED framework applicable till 31st May, 2020 and approved by the Commission vide suo motu Orders dated 31st January, 2019 on Petition No. 02/SM/2019 (suo motu); dated 11th September, 2019 on Petition No. 08/SM/2019 (suo motu); and dated 23rd March, 2020 on Petition No. 01/SM/2020 (suo motu) are as under:

a. SCED pilot is being implemented by POSOCO without violating grid security and honouring the existing scheduling practices prescribed in the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 (hereinafter referred to as IEGC or Grid Code) in respect of all thermal Inter State Generating Stations (ISGS) that are regional entities, whose tariff is determined or adopted by the Commission for their full capacity and are willing to participate in the SCED.

b. The variable charges declared by the generators for the purpose of Reserve Regulation Ancillary Services (RRAS) are considered in the optimisation process.



- c. Schedules of the States/ beneficiaries are not changed and the beneficiaries continue to pay the charges for the scheduled energy directly to the generator as per the existing practice.
- d. NLDC has opened a separate bank account called ‘National Pool Account (SCED)’. All payments to/from the generators and to the Discoms on account of SCED flow to/from the said National Pool Account (SCED).
- e. For any increment in the injection schedule of a generator due to optimization, the generator is paid from the National Pool Account (SCED) for the incremental generation at the rate of its variable charge.
- f. For any decrement in the schedule of a generator due to optimization, the generator pays to the aforesaid National Pool Account (SCED) – hereinafter also referred to as the pool – for the decremental generation at the rate of its variable charge after discounting heat rate compensation due to part load operation as certified by RPC as per the provisions of IEGC.
- g. The incremental changes in schedules on account of optimization are not considered for incentive computation (which otherwise would have been available in terms of the relevant Tariff Regulations) for the generating stations. The deviation (in terms of provisions of DSM Regulations) in respect of such generators is settled with reference to their revised schedules. The increment or decrement of generation under SCED does not form part of RRAS.
- h. The RPCs issue weekly SCED accounts along with the DSM, RRAS, and AGC accounts based on the data provided to them by RLDCs.
- i. RPCs issue the regional energy accounts including the SCED



schedules and NLDC issues a consolidated “National SCED Settlement Statement” comprising payment and receipts to/from all generators and to all the Discoms participating in the SCED.

j. The net saving accrued in the pool after adjusting heat rate compensation for part load operation of the generators is shared in the ratio of 50:50 between the generators participating in SCED and the concerned beneficiaries/ discoms, on a monthly basis.

k. The savings (50% of the net savings accrued in the pool) corresponding to the beneficiaries/ discoms is shared in proportion to their final schedule in the generating stations covered under SCED pilot on a monthly basis as per the Regional Energy Account (REA) issued by RPCs.

l. The generators share (i.e. 50% of the net savings accrued in the pool) is allocated to SCED Up and SCED Down generators in the ratio of 60:40 respectively for each time block.

m. POSOCO maintains the relevant data during the operation of the pilot, including but not limited to generating station-wise installed capacity, declared capacity, schedule (including all revisions), Un-Requisitioned Surplus, generator-wise variable cost, optimisation up/down, part-load compensation (if payable), discom/ constituent-wise share in respective generating stations and requisition (day-ahead and last revision) from the generating stations.

4. In compliance of the said directives, POSOCO has been implementing the SCED pilot w.e.f. 1st April, 2019.

5. POSOCO has framed the Detailed Procedure for operationalizing and implementing the pilot on SCED, based on consultation with concerned stakeholders.



6. NLDC is managing 'National Pool Account (SCED)' as a custodian under the directions of the Commission, for settlement of SCED transactions. The Commission has been apprised that the weekly SCED account is being issued by the concerned Regional Power Committees (RPCs) and NLDC is issuing a consolidated 'National SCED Settlement Statement' comprising payments and receipts to/from all generators and to the Discoms participating in SCED, on a regular basis.

7. The Commission is being updated on various operational and implementation aspects of the SCED pilot and has been receiving insights from NLDC on a regular basis.

8. NLDC has informed that a mix of technologies has been integrated and data exchange has been facilitated between different layers of applications at RLDCs and NLDC, along with an enhancement in infrastructure to comply with stringent timelines. NLDC has also conducted a series of workshops with stakeholders like Regional Power Committees (RPCs), SCED generators and State Load Dispatch Centres (SLDCs).

9. As directed by the Commission, POSOCO has submitted a detailed feedback report on 31st January, 2020, highlighting the benefits and the optimisation results of the pilot on SCED, for the period from April, 2019 to December, 2019.

10. According to the report, fifty-two (52) coal and lignite based thermal ISGS, consisting of 135 generating units and having a total installed capacity of 58,060 MW, are participating in the pilot on SCED. The daily average perturbation of SCED generators is around 1320 MW out of the total capacity available in the pilot on SCED. The average System Marginal Price (SMP)



during this period was found to be 287 paise/unit.

11. Post 1st October, 2019, while five generating stations with 6540 MW capacity have opted out from the SCED pilot, two generating stations with 1460 MW capacity have joined the SCED pilot.

12. The report highlights that Declared Capacity of generating stations participating under SCED is automatically getting tested based on the System Marginal Price (SMP), without the need for commensurate requisition from the beneficiaries.

13. The report has brought out that SCED has eased the generators' operations. There has been 29% decrease in the number of instructions (counting each change in the schedule of the generator by the RLDC as one instruction) in the injection schedules of participating generators and 42% decrease in the cumulative MW schedule change.

14. The weekly SCED accounts issued by the respective RPCs (for the period April-December, 2019) reveal that a total of ₹1715 crore has been paid to SCED generators for incremental generation on account of SCED, whereas a total of ₹2560 crore has been paid by SCED generators on account of decrement in generation on account of SCED. Thus, there has been a fuel cost reduction of about ₹845 crore, for the period April-December, 2019, which translates to a reduction of about 3 paisa/kWh in the average variable cost of generation during the period.

15. The report brings out that pit-head generation with lower variable cost is being increased in Western Region and Eastern Region, whereas generation with higher variable cost is being decreased in Southern Region and Northern Region.



This has led to the optimisation of generation across the country, thereby reducing the generation cost.

16. The report also highlights that SCED has resulted in the consolidation of the available spinning reserve in higher variable cost generators. Further, the availability of reserve is getting constrained by the ramping capability of generation units carrying reserve, resulting in a reduction of cumulative reserve quantum after the SCED optimisation process. The report brings out that though the total spinning reserve remains unaltered after SCED optimization, as a result of the equality constraint, the available up-spinning reserve is getting consolidated in higher variable cost generators and vice versa.

17. The report points out that there has been a marginal increase in transmission losses due to the SCED pilot. Simulation analysis for two months has revealed a 0.4% increase in transmission losses (approximately 0.013% of total all India transmission losses) with SCED, compared to losses without SCED.

18. In the report, POSOCO also highlighted the various challenges faced by them during the implementation of SCED. Therein, IT-related challenges included the development of in-house software (with self-healing and ride-through attributes, and minimal manual intervention), along with integration of hardware required for running it. Another challenge involved the scheduling of SCED pan India (considering its scale), and the communication of the same. Operational flexibilities under the current regulatory constraints were also incorporated by POSOCO. Classical methods for handling infeasibility by incorporating additional variables have been used in the optimization algorithm to ride through various infeasibilities. Analysis of duals has also been presented in the detailed feedback. Furthermore, inter-regional schedules are also being



reconciled by the neighbouring regions. POSOCO also inserted a process crash detection module in the SCED software with an ‘auto-stop’ feature, for monitoring purposes. Due to such interventions, the non-availability of the SCED software application during the pilot phase was only around 2% of time.

19. The detailed report also shed light on the way forward for the pilot on SCED starting with the requirement of incremental heat rate curves, and the expansion of the ambit of SCED (for a more efficient optimisation of untied capacities of generation resources), sharing of benefits among various stakeholders (State Utilities, ISGS, ISTS licensees, and innovation and research). There is also a need to increase the minimum turn-down level for generators (to enhance the scope for optimization and cost reduction), streamlining of scheduling process by taking into account Real Time Market (RTM), and incorporation of more robust communication infrastructure. Apart from these, the report also highlighted that going forward; the regulatory provision of keeping additional spinning reserves if required also need to be explored. POSOCO also suggested incentives linked to ramp rates as a way forward in SCED, and hinted upon inter-regional scheduling, co-optimisation of energy and ancillary services, security-constrained unit commitment, intra-State SCED, station heat rate (SHR) compensation and consideration of impacts of emission.

Analysis & Decision:

20. The Commission observes that SCED has helped gain 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. It is evident from the feedback report that SCED implementation involved software development, creating interfaces, improving inter-control centre communication systems, information dissemination in real time and streamlining settlement



system.

21. The Commission appreciates the initiatives taken and efforts made by POSOCO in addressing various complexities in scheduling changes, synchronisation of data, challenges in communication, etc. while developing the software application in-house.

22. The Commission finds that implementation of SCED pilot has shown positive results by utilisation of available cheaper generation, within and across regions.

23. The reduction in fuel cost due to SCED is largely attributed to the system level visibility of available cheaper generation at the National level. Similarly, utilization of available transmission capability towards Northern Region, North Eastern Region and Southern Region since the implementation of SCED pilot showcases the utilisation of available cheaper generation to their full capacity, within and across the regions.

24. The Commission has perused the way forward as suggested by POSOCO in their detailed feedback report. Most of the suggestions, for instance, the suggestions for consideration of the heat rate information (incremental heat rate curves) for dispatch decision; further lowering of the current technical minimum norm of 55%; inter-regional scheduling; security-constrained unit commitment (SCUC); and co-optimisation of energy and ancillary services 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 appropriate time by following the due regulatory process. The Commission has, however, taken note of the suggestions relating to expanding the scope of SCED as also the need for



streamlining the scheduling process, especially with the introduction of RTM.

Expanding the scope and period of SCED pilot

25. The scope of optimisation and, therefore, the possibility of minimising system cost steers the need for appropriate regulatory framework in the context. RTM, which will be rolled out shortly, is expected to optimise the last-mile available resources through a market platform. However, there will still be scope of optimisation through SCED after the gate closure. Accordingly, the Commission has decided to extend the SCED pilot beyond 1st June, 2020, for a further period up to 31st March, 2021. The Commission has at the same time decided to expand the ambit of SCED by including the generators other than the thermal ISGS whose tariff is determined by the Commission.

26. It has been observed from the feedback report submitted by POSOCO dated 31st January 2020 that the available spinning reserve is getting consolidated in higher variable cost generators and the availability of reserve is getting constrained by the ramping capability of generating units carrying reserves. The Commission expects that expanding the ambit of SCED (by including more generators) will improve the ramping capability available in the system. The Commission also recognises that expanding the ambit of SCED would enhance the scope of optimisation of SCED while achieving reduction in the system cost. Therefore, the Commission has also decided to expand the ambit of SCED by including more generators. Currently only those thermal ISGS are participating who are regional entities and whose tariff is determined or adopted by the Commission for their full capacity.

27. During the extended period, it is decided that the SCED pilot will be open to all generating stations that are willing to participate during the extended period



up to 31st March, 2021. These include generating stations owned by the State entity and having capabilities to communicate with RLDCs/ 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.

28. Generators already participating in the SCED pilot shall continue to participate in the Pilot for the extended period. Other generators willing to participate in the extended period shall be required to provide a one-time consent for participation in 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.

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

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

c. For generators with no tied capacity (merchant generator), 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.

30. Generators participating in the pilot shall also be required to declare on monthly basis relevant technical parameters as required by NLDC/ RLDCs/ RPCs, including but not limited to installed capacity, declared capability (DC), Technical Minimum, Ramp up/ Ramp down capability etc. Generators shall also communicate the details of Discom/ constituent-wise share in generating station, requisition (day-ahead and last revision) from the generating station to respective RLDC/ SLDC.

31. As at present 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 (refer to paras 28-29 of this order). 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 (refer to paras 28-29 of this order) after discounting heat rate compensation due to part load operation as certified by respective RPCs in case of regional entities and appropriate authority in case of other generators.



32. As per the existing practice, 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 SCED shall not form part of RRAS.

Sharing of System Savings

33. For sharing the net savings as a result of SCED, for this extension period (1st June, 2020 to 31st March, 2021), the Commission has decided to bring parity with the benefit sharing mechanism (sharing of net gains) specified for Real Time Market (RTM) in respect of tied capacity of generators. This is required in order to address the possibility of any arbitrage between RTM and SCED for the participating generators, as a generator, not getting cleared in RTM, has the option of participating in SCED.

34. Accordingly, the Commission decides that the net savings as a result of SCED after adjusting heat rate compensation for part load operation of the generators shall be shared in the following manner:

- a. 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.
- b. The remaining benefits (after segregation as at step ‘a’ 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 'a' above) corresponding to the beneficiaries/ Discoms shall be shared in proportion to their final schedule from the generating stations covered under SCED pilot.

c. The benefit of generators with tied capacity (i.e. 50% of the remaining benefits after segregation as at step 'a' above) shall be shared between SCED Up and SCED Down generators in the ratio of 60:40 for respective time block. 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 generator's benefit shall be shared among the participating generators with tied capacity receiving SCED down signals in proportion to their SCED schedule.

d. 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 'b' above.

e. 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.

f. 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 'a' 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 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 'a' 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 at (a) above, proportionate to the untied capacity, shall accrue to such generators as their final share for the untied capacity.

35. The above sharing mechanism shall apply subject to the following:
- a. 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.
 - b. 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 reference for this purpose shall be according to the provisions in the respective PPA(s) read with the relevant regulations of the Appropriate Commission.
 - c. Generators with no tied capacities (merchant generators) shall not be eligible for any heat rate compensation for part load operation.

36. The benefit sharing mechanism for SCED generators is explained through



the following illustration. Consider a hypothetical situation for a 15-minute time block, where the net benefit accrued in the National pool after adjusting compensation for part load operation is Rs. 80,000. Assume that in that particular time block, four generators (G-1, G-2, G-3 and G-4) are contributing to SCED Up and two generators (G-5 and G-6) are contributing to SCED Down, say for 1000 MW of SCED Schedule. Here G-3 contributes 400 MW SCED up, G-4 contributes 300 MW SCED up, G-5 contributes 500 MW SCED down and G-6 contributes 500 MW SCED down. Thus, there would be total of 2000 MW SCED contribution i.e. 1000 MW of SCED up and 1000 MW of SCED down. Assuming further that G-1 is a merchant generator and contributing 100 MW SCED Up and G-2 is a generator with part capacity tied, contributing 200 MW SCED Up (150 MW from tied portion and 50 MW from untied portion) in that time-block. G-3, G-4, G-5 and G-6 are generators with full capacity tied.

- a. Then the share towards ‘untied capacity’ of merchant generators as well as generators with part capacity tied would be calculated as shown below:

Table 1: System Saving			
SYSTEM SAVING (in Rs.)	S = 80,000	SCED (UP+ DOWN) (in MW)	Y = 2,000

Table 2: Share of System Saving for Merchant Generator						
SCED Up	SCED Schedule	SCED Contribution	Contribution in SCED Total	Benefit accrued to Generator	Estimated Benefits to Generator	Final Benefit to Generator
Generators	MW	kWh	%	Rs.	Rs./kWh	Rs.
	a	b = a×1000/4	c = a / Y (%)	d = c × S	e = d/b	f ₁ = d
G-1 (Merchant)	100	25000	5%	4000	0.16	4000



Table 3: Share of system saving for generator with part capacity united - treatment for untied portion						
SCED Up	SCED Schedule	SCED Contribution	Contribution in SCED Total	Benefit accrued to Generator	Estimated Benefits to Generator	Final Benefit to Generator for untied capacity
Generators	MW	kWh	%	Rs.	Rs./kWh	Rs.
	A	$b = a \times 1000/4$	$c = a / Y (\%)$	$d = c \times S$	$e = d/b$	$f_2 = d$
G-2 (Part capacity un-tied)	200	50000	10%			
Contribution from United Capacity	50	12500	2.5%	2000	0.16	2000
Contribution from Tied Capacity	150	37500	7.5%	-	-	-

b. The remaining benefits (S^*) [where $S^* = S - (f_1 + f_2)$] shall then be shared in the ratio of 50:50 between the generators (with tied capacity, participating in SCED) and the concerned beneficiaries/ Discoms. Thereafter, the benefit of generators with tied capacity (i.e. 50% of S^*) shall be shared between SCED Up and SCED Down generators in the ratio of 60:40 respectively for respective time block as shown below:

Table 4: Sharing of remaining benefits (S^*) between generators with tied capacity and their beneficiaries							
System Saving (Rs.)	Benefit to Merchant generator (Rs.)	Benefit to United Portion of generator with part tied capacity (Rs.)	Net System Saving (Rs.)	Generators share in Rs. (50% of S^*)	Discoms Share in Rs. (50% of S^*)	SCED UP Generators Contribution (Rs.)	SCED Down Generators Contribution (Rs.)
$a = S$	$b = (f_1 \text{ of Table 2})$	$c = (f_2 \text{ of Table 3})$	$d = S^* = a - b - c$	$e_1 = d/2$	$f_1 = d/2$	$g_1 = e_1 \times 60\%$	$h_1 = e_1 \times 40\%$
80,000	4,000	2,000	74,000	37,000	37,000	22,200	14,800



Table 4A: Sharing of benefits between SCED Up and SCED Down generators with tied capacity									
SCED Up		SCED Schedule	SCED Contribution	Generator's Contribution (%)	Generator's Contribution in Share of Saving	Estimated Benefits to Generator	Generator's Benefit subject to cap of 7 paise / kWh	Final Benefit to Generator	Additional Benefit to Discoms
Generators		(MW)	(kWh)	(x_i / X)	Rs.	Rs./kWh	Rs.	Rs.	Rs. Lakh
		A	$b = a \times 1000 / 4$	c	$d = c \times g_1$ (ref. Table 4)	$e = d / b$	$f = 0.07 \times b$	$g = \min(d, f)$	$h = d - g$
SCED UP Total	$X = \sum x_i$	850	2,12,500	100%	22,200	0.10	14,875	14,875	7,325
G-2 Tied Portion	x_1	150	37,500	18%	3,918	0.10	2625	2625	1,293
G-3 (full capacity tied)	x_2	400	1,00,000	47%	10,447	0.10	7000	7000	3,447
G-4 (full capacity tied)	x_3	300	75,000	35%	7,835	0.10	5250	5250	2,585
SCED Down		SCED Schedule	SCED Contribution	Generator's Contribution (%)	Benefit accrued to Generator	Estimated Benefits to Generator	Generator's Benefit subject to cap of 7 paise/ kWh	Final Benefit	Additional Benefit to Discoms
Generators		(MW)	(kWh)	(y_i / Y) in	Rs.	Rs./kWh		Rs.	Rs.
		A	$b = a \times 1000 / 4$	c	$d = c \times (h_1 \text{ of Table 4})$	$e = d / b$	$f = 0.07 \times b$	$g = \min(d, f)$	$h = d - g$
Total	$Y = \sum y_i$	1,000	2,50,000	100%	14,800	0.06	17,500	14,800	-
G-5 (full capacity tied)	y_1	500	1,25,000	50%	7,400	0.06	8,750	7,400	-
G-6 (full capacity tied)	y_2	500	1,25,000	50%	7,400	0.06	8,750	7,400	-

c. Thus, in this example, the total system saving will be shared among the generators and Discoms/ beneficiaries as shown in Table 5.

Table 5: Final Share of benefits among generators discoms		
	Total Benefits to Generators (Rs.)	Total Benefits to DISCOMs (Rs.)
System Saving (after Heat Rate Compensation) (Rs.)	80,000	
Share of Merchant Generators (ref Table 2)	4,000	NA
Share for united capacity of generator (ref Table 3)	2,000	NA
Benefit from System Pool (ref Table 4)		37,000
Benefit from SCED Up Contribution (ref Table 4A)	14,875	7,325
Benefit from SCED Down Contribution (ref Table 4A)	14,800	-
Total Benefit (Rs.)	35,675	44,325



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

Scheduling Process under RTM and SCED

38. POSOCO has also highlighted the need for further streamlining the scheduling process, especially with the introduction of RTM. The Commission believes that the half-hourly RTM will bring the required flexibility in the system and the introduction of gate closure will provide more certainty in despatch, especially in terms of reserve requirement. The Commission expects that the stakeholders would use the RTM platform – the buyers for meeting their real time energy needs and the sellers, including the generators having un-requisitioned surplus (URS), for selling their schedulable surplus. SCED is another window of optimisation for a particular time block after the RTM for that time block has closed. POSOCO shall, therefore, run SCED after gate closure.

39. POSOCO shall accordingly modify the Detailed Procedure for SCED while taking into account above mentioned directions for the extended period from 1st June, 2020 to 31st March, 2021.

Summary of Decisions:

40. The Commission decides to extend implementation of SCED pilot for the period from 1st June, 2020 to 31st March, 2021, and expand its scope to all generating stations willing to participate in the pilot.



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

42. The net savings after adjusting the compensation for part load operation to the generators shall be shared among the beneficiaries and the participating generators in the manner as specified in this order, during the extended period of the pilot from 1st June, 2020 to 31st March, 2021.

43. POSOCO shall modify the Detailed Procedure suitably to give effect to the decisions of the Commission in this order.

44. POSOCO is 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.

45. The petition No. 08/SM/2020 (suo motu) is disposed of in terms of the above directions.

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