SAMAST Implementation in NER: An Innovative Approach

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SYNOPSIS

The SAMAST scheme was introduced with the aim of achieving an efficient mechanism for the proper scheduling to settlement of electricity transactions in a transparent manner for the power transactions across intra-state boundaries. In this paper, emphasis has been laid on the special efforts undertaken for the implementation of SAMAST in NER states. An integrated approach taking all seven states on board right from initial discussion, preparation of DPR, drafting of SRS/ technical specifications and common tendering option by a single agency on behalf of all states have made it possible to go ahead with SAMAST in all NER states with diverse characteristics. This paper briefly describes the innovative approach in NER for execution of SAMAST in all the seven NER states.

KEYWORDS

SLDC, Forum of Regulators, Scheduling, Accounting, Metering, Settlement, Electricity Transaction, Intra-state, NER States, Integrated Approach

1. INTRODUCTION

The power sector witnessed growth of large number of players in the market with the advent of license free generation. The numerous entities involved in the power market are accountable for the business that they undertake in the electricity market. Since the intra-state entities primarily function in identified control areas within the state boundaries, the jurisdiction of SLDCs extend to the supervision, monitoring and control over them so that an integrated operation of the power system within the state could be ensured. In India, only six states viz. Delhi, Maharashtra, Gujarat, Madhya Pradesh, West Bengal and Chhattisgarh have introduced intra-state deviation system for all intra-state entities within the state as shown in Fig. 1. Remaining states are yet to implement the system in totality and are at various stages of implementation. Thus, a scheme that could suitably address the pressing need for the proper **s**cheduling to **s**ettlement of electricity transactions in a transparent manner became indispensable to ensure a robust commercial ledgering mechanism for power transactions across intra-state boundaries.

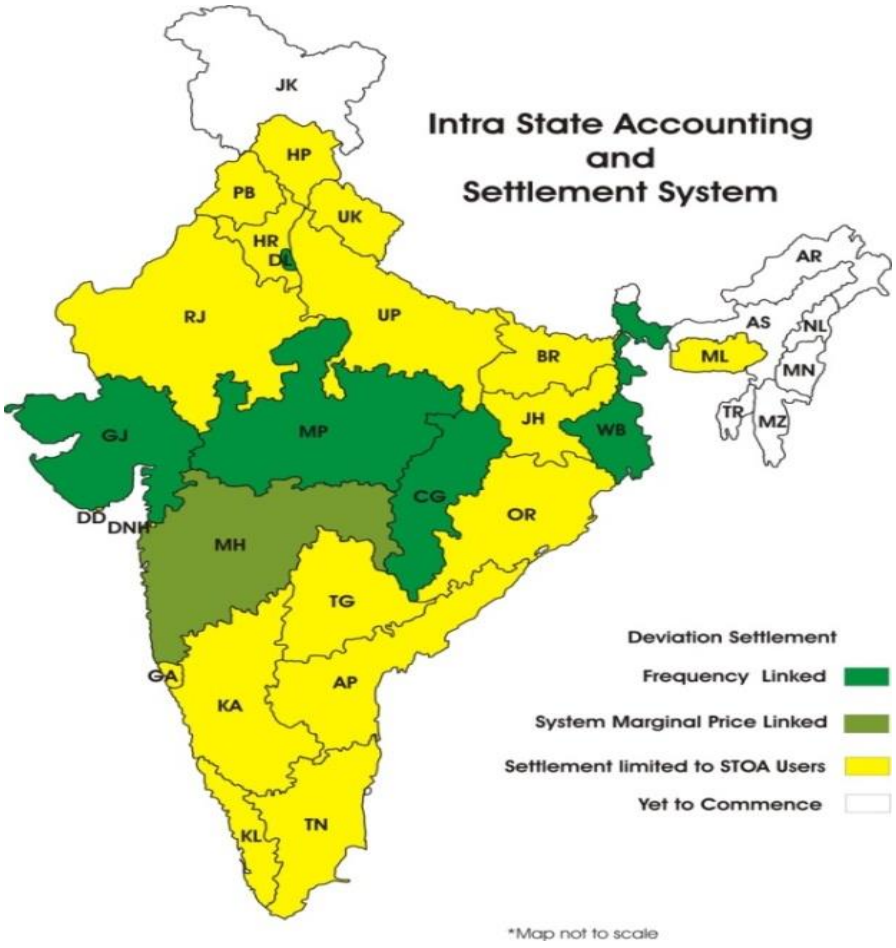


Fig. 1. Accounting and Settlement System-Intra-State

Taking note of the progressive impact of the implementation of the Availability Based Tariff (ABT) accompanied with its sui generis UI component at the national level by Central Electricity Regulatory Commission (CERC), the National Electricity Policy (NEP) notified in 2005 had exhorted the State Electricity Regulatory Commissions (SERCs) to initiate the ABT regime intra-state within a year with the hope of achieving a similar credible transaction settlement mechanism at the state level. The committee formed by the Forum of Indian Regulators (FOIR) in March 2005 recommended the establishment of an intra-state ABT mechanism compatible with its inter-state counterpart. Also a number of States had notified Short Term Open Access (STOA) regulations by virtue of which the intra- state STOA transactions had to be scheduled along with the long term and medium term transactions by the respective SLDCs thereby making it crucial to bring in a system that would ensure forecast, load management and dispatch discipline amongst the intra-state entities.

To achieve this plan, a sub-committee under the aegis of Forum of Regulators Technical Committee, after wide discussions and consultations with the stakeholders, came up with a report called **S**cheduling, **A**ccounting, **M**etering and **S**ettlement of **T**ransactions in electricity (**SAMAST**) which was adopted by the FOR Technical Committee in July, 2016. The Report

stipulated a time frame for implementation of the scheme in all states in a period of 365 days from zero date.

North Eastern Region (NER) has been lagging behind other electrical regions of the country as far as power system development is concerned. Full-fledged State Load Despatch Centre (SLDC) in all the seven states of the region has come up very recently. Hence, there was a need to make special efforts to implement SAMAST in NER states. Accordingly, a SAMAST group was formed in NER and it played a pro-active role in planning and implementing the SAMAST scheme.

2. SAMAST IN NER: THE BEGINNING

The pre-requisites for effective implementation of state level DSM mechanism includes firstly, the identification of intra-state entities and the inter-utility as well as intra-utility interface metering points and secondly, the establishment of adequate infrastructure necessary for time-block-wise energy metering, accounting and communication systems including telemetry network, in accordance with the provisions of the Grid Code in force. Also, emphasizing the need of advanced tools for forecasting, scheduling and load generation balancing systems is necessary so as to manage the deviations of intra-state entities. Apart from this, suitable IT infrastructure for timely data acquisition, maintenance of registry and architecture for hardware, software and data management is indispensable to the state level DSM plan. Lastly, ensuring ring fencing of SLDCs, smooth information flow amongst the identified participants, Certification of LDC personnel and providing incentives to as well as capacity building of the manpower likely to be engaged in the process is also essential.

Following the suggestion rendered by Hon'ble CERC Members, a two members NER SAMAST group was formed vide letter dated 23.06.2017 by MS-NERPC, comprising of two members, one each from NERPC and NERLDC. Analysing NER's potential and challenges for the execution of SAMAST project, regional implementation approach was adopted as a unique method hitherto not tried or tested elsewhere in the country. In this scheme of things, the SAMAST Group made lot of efforts to mobilise experts in the field of metering, IT, Communication, AMR, etc and organised capacity building programmes in all SLDCs of NER as shown in Fig. 2.

3. MOVING TOGETHER WITH A COMMON GOAL

The Detailed Project Reports (DPR) prepared by other states of the country was taken as reference and working groups in SLDCs started functioning towards achieving seven objectives namely, Identification of intra-state entities, Demarcation of interface boundary for each intra-state entity, Assessment of meters- Main, Check and Standby, Assessment of AMR, Assessment of IT infrastructure, Preparation of BOQ and finally Preparation of DPR.

Backed by the catalytic support extended from the SAMAST group, the states were able to adopt a common and cohesive approach in achieving the seven objectives and the DPR of the seven states took shape along uniform lines by May, 2018. A Committee under the SAMAST Group was formed by NERPC to moderate and freeze a common DPR for NER. It was then subjected to approval and clearance from all the states which was the final stroke prior to laying it before the PSDF for funding.

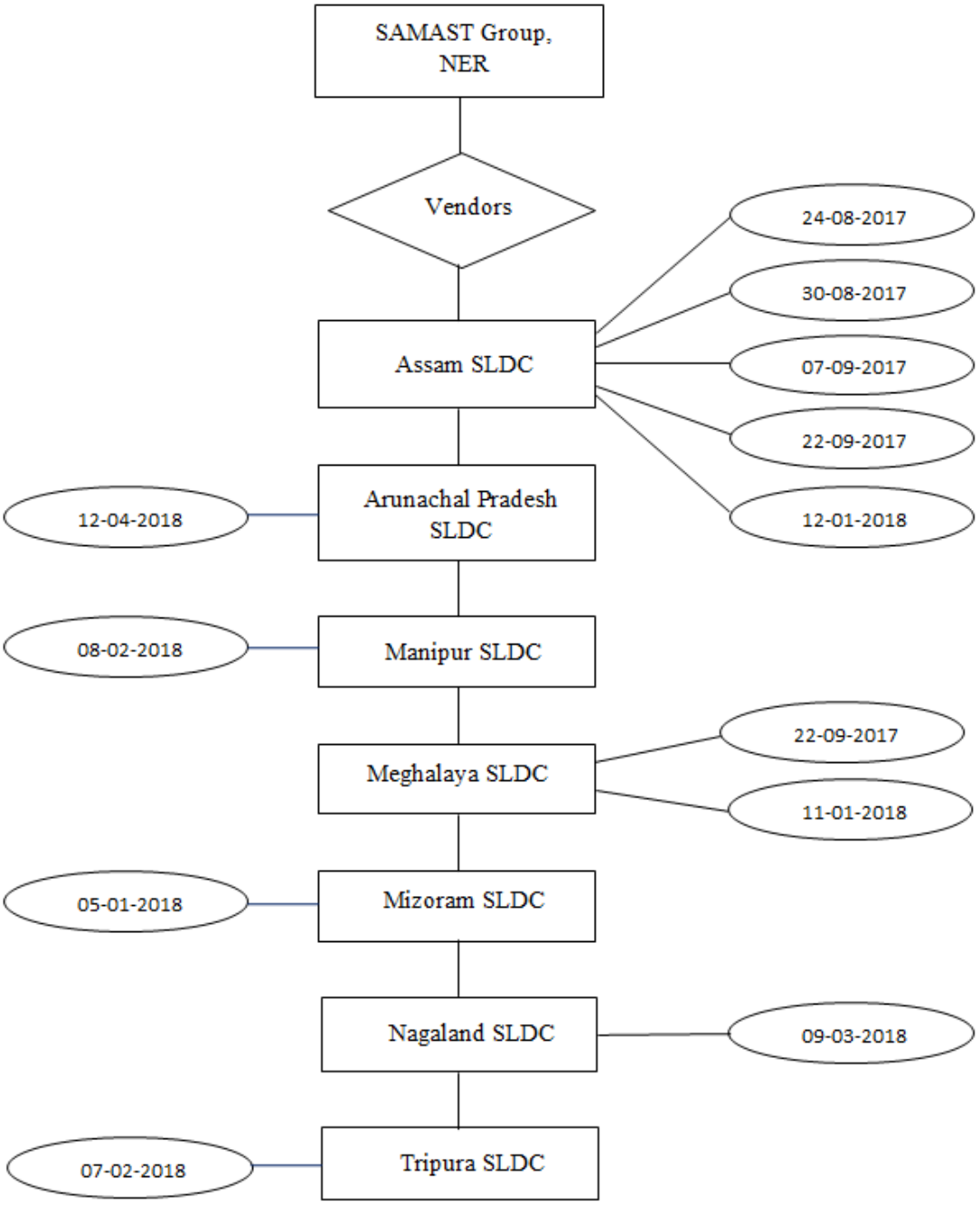


Fig. 2. Co-ordination meetings-Capacity building

The SAMAST Group of NER was determined to settle on common Software Requirement Specifications (SRS) for all six utilities software's such as Scheduling software, Meter data processing software, Energy Accounting Software, Deviation/Reactive Accounting software, Open Access software, and AMR software. The idea was to device a one of its own kind uniform modus operandi across all states of the region. All the software's being web-based, it was even possible to have an ambitious dream to operate SAMAST of one SLDC from another in case of need. The project cost as in the DPR is shown in Table I.

TABLE I. Project cost table

SAMAST DPR of NER States

Figures Rs. In Lacs

Sl. No.	Name	No of Meters	Cost of Meter	Cost/Meter	Cost of HW/SW	Project Cost of SAMAST	CT/PT replacement Cost	GRAND Total
1	AP	121	55.7	0.461	1287.6	1343.3	0.0	1343.3
2	Assam	700	322.5	0.461	1530.8	1853.3	157.6	2010.9
3	Manipur	589	284.9	0.484	1561.6	1846.5	1685.5	3532.0
4	Meghalaya	374	180.9	0.484	1467.0	1647.9	229.3	1877.2
5	Mizoram	413	190.3	0.461	1435.7	1626.0	200.0	1825.9
6	Nagaland	198	91.2	0.461	1335.9	1427.1	445.0	1872.2
7	Tripura	366	168.6	0.461	1343.1	1511.7	1339.3	2851.0
	Total	2761	1294.0		9961.8	11255.8	4056.6	15312.5

4. THE CHALLENGES

The move to implement SAMAST in NER is easier said than done due to the number of hurdles that mars the road to making SAMAST a success story in NER. Firstly, NER is poorly connected to the Indian mainland thereby alienating it from other regions of the country. This handicapped geographical positioning of the region comes with the added disadvantage of rough hilly terrains and extreme weather conditions. This serves as a serious impediment in meeting the large number of metering requirements in diverse locations. Table II reflects the number of meters and metering locations in the region. This would pose a tremendous challenge for the vendors to carry out commissioning activities in such diverse locations. Secondly, the threat to timely data acquisition stems from the poor communication network which is largely dependent on GPRS or Mobile network with little optical fibre connectivity. GPRS network is also not available in number of locations where manual collection of reading through Data Collecting Device (DCD) would have to be resorted to. Furthermore, availability of good vendors is also a challenge in NER as leading parties are not very keen to venture into the region for obvious reasons.

TABLE II. Metering locations

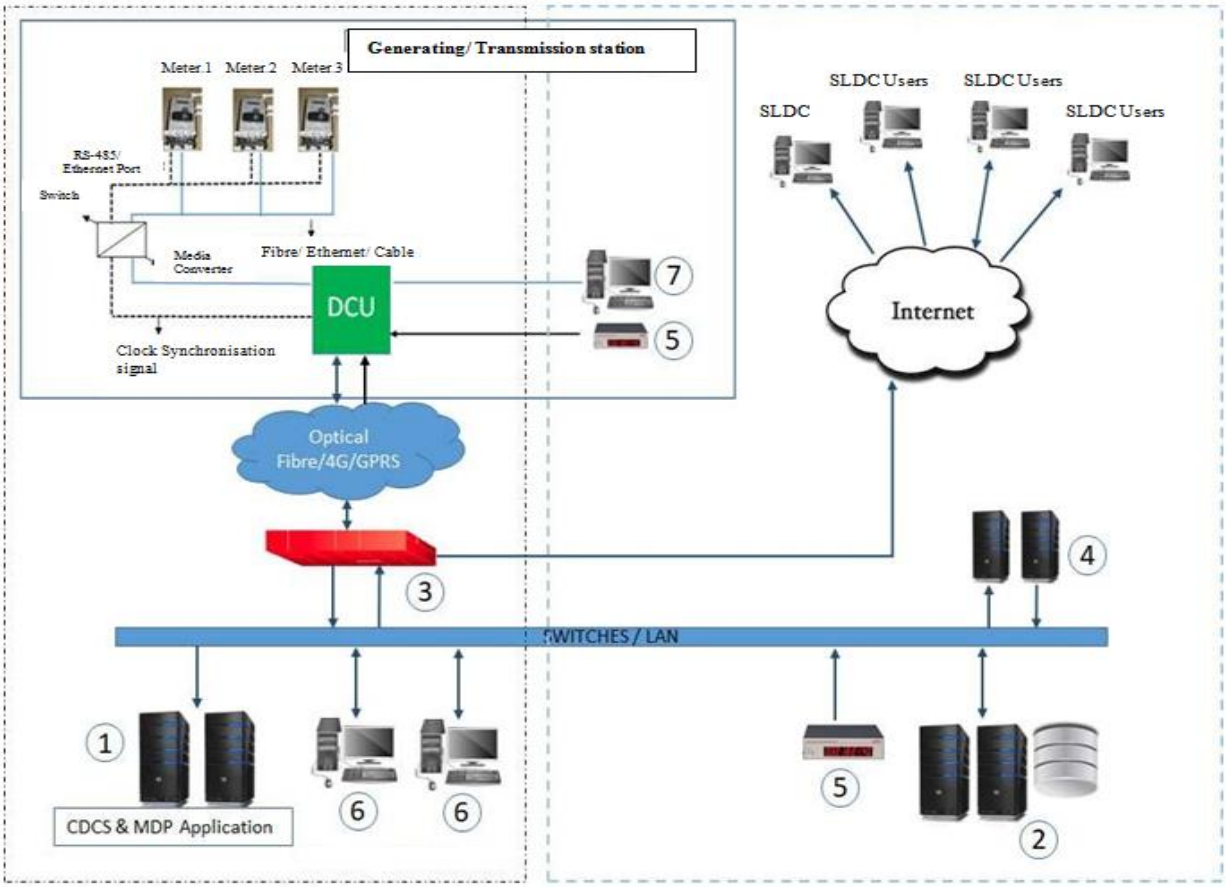
State	Location	Meter
Arunachal Pradesh	13	121
Assam	100	700
Manipur	95	589
Meghalaya	34	374
Mizoram	63	413
Nagaland	28	198
Tripura	29	366
Total	**362**	**2761**

Diversity across SLDCs in terms of technological capability and resource strength poses a challenge to the plan of having a common SAMAST implementation scheme since few SLDCs such as that of Meghalaya, Assam and Manipur are quite advanced in comparison to Arunachal Pradesh and Nagaland which are at a nascent stage.

5. THE CULMINATION

One of the action plans to address the challenges was by way of assigning a single agency to act on behalf of all seven states for making bulk tendering from a single point. The pros derived from adopting such a sui generis approach were manifold that included inter alia, smooth implementation, optimisation of project cost –A total saving of about Rs. 14 Crores (Rs. 2 Crores/State) was envisaged in the procurement of utility software, overcoming the issue of paucity in the number of vendors given the small market availability in NER and strengthening co-ordination efforts crucial for promoting hand-holding amongst the states.
The proposal for bulk common tendering at one place was approved following the presentation made by the SAMAST Group before CERC, FOR Technical Committee and NERPC. With this approach, the project moved to a fast track mode, which would have not been possible had the states resorted to their own individual tendering. This helped in making it a prodigious project with many reputed vendors showing interest to bid in the project. It also created an enabling environment to overcome the bottlenecks by allowing all the SLDCs to work together on a common platform in this period of change. Phase-wise implementation in packages has also been planned as another measure which would enable to address the difficulties in diverse locations as the project is being envisaged to be implemented stage by stage.

The overall scheme for flow of meter data to the SLDCs for SAMAST would be as per schematic in Fig. 3.



Sr. No.	Description
1, 2, 4	Servers
3	Firewall
5	GPS clock
6, 7	PCs

Fig. 3. Concept diagram of AMR system

6. CONCLUSION

The evolution of the Power system has witnessed a fast paced upward growth trend which holds equally true for the increasing complexities that are concomitant to technological advancement.

A simultaneous growth in the power market has necessitated proper energy metering, accounting and a commercial mechanism for settlement of transactions of power transmitted across state boundaries. In this respect, NER states have shown tremendous enthusiasm for meeting these needs through the SAMAST project. At this stage the DPR for SAMAST execution in NER has been tabled for PSDF funding which is likely to be through by March, 2019. A 365 days target period has been set for achieving the desired goal to have SAMAST in place in all seven states of the region by April 2020.
Table III below highlights the milestones accomplished so far as well as the target dates to be

achieved in the implementation of SAMAST in NER.

TABLE III. Milestones achieved so far as well as the target dates

S.No	DATE	EVENT
1.	23.06.2017	Formation of SAMAST Group in NER
2.	24.08.2017-07.02.2018	Meeting/ Capacity building involving states and vendors
3.	19.03.2018	Presentation before CERC by SAMAST Group
4.	16.04.2018	Presentation before FOR Technical Committee by SAMAST Group
5.	20.05.2018	Finalization of draft DPR of all states
6.	30.05.2018	Scrutiny of DPR and submission for PSDF funding
7.	03.07.2018	Formation of Working Group for preparation of SRS of utility software and IT roadmap common for all SLDCs
8.	20.09.2018	Preparation of draft SRS of utility software and IT roadmaps for SLDCs
9.	18.10.2018	Queries received from Techno Economic Sub Group (TESG) of PSDF
10.	20.12.2018	Meeting with states to firm up common reply to Queries
11.	28.01.2019	Submission of comprehensive reply to TESG
12.	Feb/ March' 19	Preparation of bid document for tendering
13.	March' 19	Probable approval of PSDF grant
14.	April/ May' 19	Common tendering for SAMAST in all seven states
15.	April' 20	Implementation of SAMAST

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8. REFERENCES

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