

Restructured Accelerated Power Development and Reforms Programme of India: Proposed Model for A State

Dr. Rohit Verma
Associate Professor, NPTI, Faridabad, Haryana, India.

The Accelerated Power Development & Reform Programme (APDRP) was launched in February 2001 by the Union government of India to promote the distribution reforms. But the APDRP could not achieve the desired goals within the stipulated time. Government of India rethought its course of action and came up with another ambitious project, Restructured Accelerated Power Development and Reforms Program (RAPDRP) to overcome the shortcomings of APDRP and to reduce the Aggregate Technical and Commercial (AT&C) losses to 15% by implementing projects within 18 to 24 months. Restructured APDRP was approved in July 2008 for implementation in the 11th five year plan. The focus of the programme is on actual, demonstrable performance in terms of sustained loss reduction. This paper analyses the major reasons behind the failure of APDRP and discusses the proposed scheme of R-APDRP and its challenges. The paper also provides a model for R-APDRP scheme for a sample State of India. This paper may be a helpful tool for policy maker and state government.

Keywords: Restructured Accelerated Power Development and Reforms Program (RAPDRP), Aggregate Technical and Commercial (AT&C) losses, Power sector reforms.

1. INTRODUCTION

The interest in restructuring and reform of the power sector is a worldwide phenomenon that is being pursued in different formats, depending on the structure and condition of the economy and political institutions in those countries [1]. The original objectives that drove the reform process aimed at maximizing the benefits to society and the establishment of efficient economic conditions in the industry and creating competitive markets in all possible segments [2]. Argentina reformed its energy sector in 1990s and developed one of the most competitive worldwide markets in power generation. The performance of the Argentinean energy sector after reform was largely reported to be successful and was often cited as a model of deregulation. The Chilean power sector, which started a deregulation process back in 1982, has been another example in the region of sound sector reforms [3]. It was observed that after restructuring, transmission and distribution (T&D) losses in Argentina have been reduced from 26% in 1991 to about 7% in 1999 [4]. Similarly, California was among the first U.S. states to deregulate its electric power sector. A structural change in the electricity industry in California was initiated on March 31, 1998 and now a day it is concluded that recent methods used in California provide examples of lessons that can be applied to other markets worldwide [5]. In India till independence, the entire power sector was under the control of private sector. After independence the private power companies were nationalized and electricity was declared a concurrent subject of the Indian Constitution which means making both

Central government and State governments as responsible parties [6]. During fifties and sixties, Inter-State power projects were established along with the transmission infrastructure to avail the power in an economical manner. In 1975, Government of India (Gol) entered in the field of generation and transmission through their Central sector utilities. However, distribution sector continued to remain with SEBs as a monopoly business. Over the period of operations, the sector developed techno-commercial inefficiencies. Restructuring therefore was felt necessary [7].

Power sector reforms in India were initiated in 1991. It began with the participation of the private investors' in generation, and then focused on the unbundling of vertically integrated utilities. The Electricity Regulatory Commissions were formed in 1998 and the Electricity Act 2003 was enacted to accelerate the power sector reforms [8]. The success or failure of the reforms in the power sector heavily depends upon the efficient management of the distribution system and the political agenda of the government. The distribution sector reforms, like the energy audit, proper metering, and MIS, are expected to improve recovery [9]. Government of India (Gol) initiated reforms in the distribution sector in 2000. As a part of distribution reforms, Gol launched APDP (Accelerated Power Development Program) in 2001 which was later rechristened as APDRP (Accelerated Power Development and Reforms Program) during the 10th Five Year Plan. To continue the support to distribution reforms during the 11th Five Year Plan, Gol has reintroduced R-APDRP (Restructured APDRP) with revised terms and conditions. The R-APDRP primarily aims at reducing Aggregate Technical and Commercial (AT&C) losses in urban areas [10]. The objective of this paper is to analyse the major reasons behind the failure of APDRP and to discuss the proposed scheme of R-APDRP and its challenges. The paper also refers to the projects that have been undertaken by the Assam government under RAPDRP.

2. ACCELERATED POWER DEVELOPMENT AND REFORM PROGRAMME IN INDIA

In the Union Budget 2002-03 APDP (Accelerated Power Development Programme) was re-christened as Accelerated Power Development and Reforms Programme (APDRP) with the stipulation that 'access of the States to the fund will be on the basis of agreed reform programmes' the center piece of which would be narrowing and ultimate elimination of the gap between unit cost of supply and revenue realization within a specific time frame. The main objectives of the APDRP were improving financial viability of the State Electricity Boards, reduction of AT&C losses, improving customer satisfaction, increasing reliability of power supply, improving quality of supply, adopting systems approach with MIS, and bringing transparency through computerization.

APDRP was an ambitious program of government of India with a budget provision of Rs. 40,000 Crore during Xth Plan, out of which Rs. 20,000 Crore was allocation under Investment component and Rs. 20,000 Crore under Incentive component. The thought was nice, as a distribution circle was identified as a Strategic Business Unit (SBU), where Superintending Engineer (SE) of the concerned circle was renamed as Chief Executive Officer (CEO), and Junior Engineer (JE) as the Feeder Manager. CEO was made accountable for implementation of the scheme from the start of framing of Detailed Project Report (DPR) to execution of the scheme; he/she has to enter Memorandum of Understanding (MoU) with the concerned DISCOMs'. MD in turn has to enter MoU with Ministry of Power (MoP), Government of India (Gol) that the targets as prescribed in the

DPR would be achieved in the time bound manner as specified. The CEO will not be transferred until the completion of the scheme [11]. But, as the Planning Commission itself noted, the APDRP scheme fell short of expectations, it was seen that while the target of reducing AT&C losses was from around 40 per cent to 15 per cent over five years, the actual reduction was not more than 5 per cent. Even then, the AT&C losses varied widely between states from 18 per cent to as much as 60 per cent. It was because of this that the Central Government came out with the R-APDRP scheme, with the aim of restoring the commercial viability of the distribution sector by putting in place mechanisms that lead to a substantial reduction in aggregate technical and commercial (AT&C) losses.

3. RESTRUCTURED ACCELERATED POWER DEVELOPMENT AND REFORM PROGRAMME IN INDIA

R-APDRP was conceived precisely to overcome the drawbacks of APDRP and is meant to decisively link the funding to sustained reduction of AT&C losses. It was approved by the Cabinet Committee on Economic Affairs in its meeting held on 31.07.2008 as a Central Sector Scheme. The focus of the programme is on actual, demonstrable performance in terms of sustained AT&C loss reduction to 15%. The total five-year allocation of R-APDRP was fixed at about Rs 51,000 Crore. It has been realized that the establishment of reliable and automated systems for sustained collection of accurate base line data and the adoption of Information Technology in the areas of energy accounting will be essential before taking up the regular distribution strengthening projects. Renovation, modernization and strengthening of 11 kV level substations, transformers/transformer centers, re-conductoring of lines at 11 kV level and below, load bifurcation, feeder separation, load balancing, HVDS (11 kV), aerial bunched conductoring in dense areas, replacement of electromagnetic energy meters with tamperproof electronic meters, installation of capacitor banks and mobile service centre's etc. has been emphasized under this programme. The Power Finance Corporation (PFC) is the nodal agency to run R-APDRP under the Power Ministry.

The programme has two major and one minor components called as Part-A, part-B, and Part-C respectively. Part-A (Rs 10,000 Crore) is aims at to make application of IT to reduce losses and includes projects for establishment of information technology based energy accounting and audit system leading to finalization of verifiable base-line AT&C loss levels in the project areas. Part-B (Rs 40,000 Crore) focuses on distribution network, in short, it envisages distribution network strengthening investments leading to reduction in loss levels. Initially, funds for the projects under both the parts are to be provided through loan (100% for Part A and 25% for Part B except special category and North-Eastern states for which under Part B 90% loan will be provided) which will be converted into grant on fulfillment of conversion conditionality and by installation of required systems within a time frame of 3 years. Besides, there is an enabling component namely, Part-C under which grant will be provided to meet the expenditure for facilitating activities of the programme [13]. R-APDRP is applicable only to urban areas that have a population of 30,000 or more (10,000 or more in the case of Special Category states) and where ATC losses are above 15 per cent. The programme is not applicable to areas where power distribution is privatized. In this reckoning, Orissa is the only state that is entirely left out of the purview of R-APDRP. Some distribution circles in Maharashtra, Delhi and Uttar Pradesh have been privatized and are hence out of the project's purview.

The entire amount of Gol loan (100 per cent) for part A of the project shall be converted into grant after establishment of the required base-line data system within a stipulated time frame and duly verified by TPIEA (Third Party Independent Evaluating Agency). Figure 1 shows the time line for part A project.

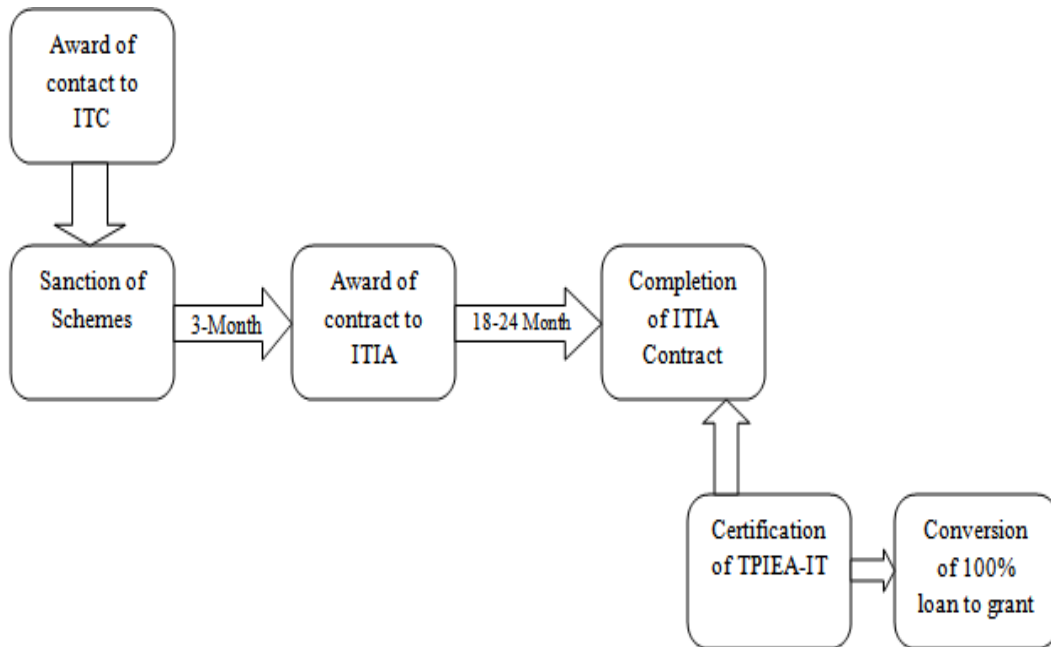


Fig. 1: R-APDRP Part-A Time Line.

Similarly, Up to 50 per cent (90 per cent for special category States) loan for Part-B projects shall be converted into grant in five equal tranches on achieving 15 per cent AT&C loss in the project area duly verified by TPIEA on a sustainable basis for a period of five years. Figure 2 shows the time line for part B.

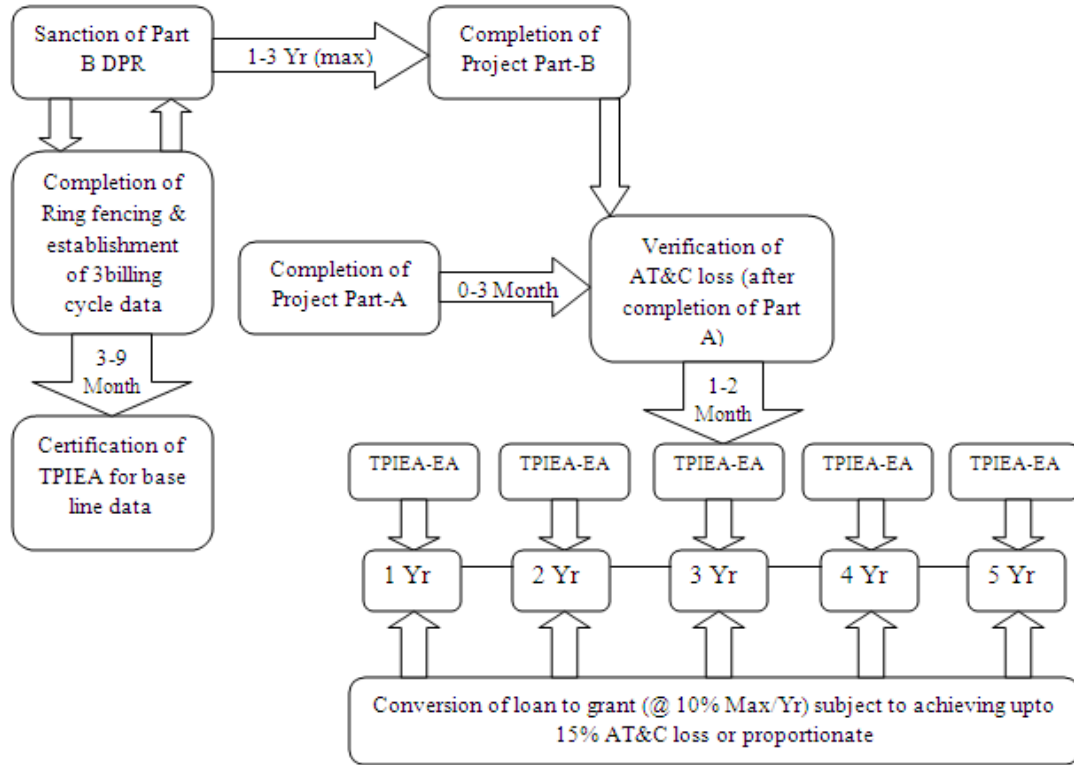


Fig. 2: R-APDRP Part-B Time Line.

If the utility fails to achieve or sustain the 15 per cent AT&C loss target in a particular year, that year's tranche of conversion of loan to grant will be reduced in proportion to the shortfall in achieving 15 per cent AT&C loss target from the starting AT&C loss figure.

3.1. R-APDRP Challenges

The aggressive timelines set as well as the scale of the program aimed at all the utilities in India. The scale and the aggressive timelines together with use of IT in a big way in the Distribution side are all new to the people on the ground, and hence pulling it of managerially is a big challenge. It is easy to say that IT will create baseline data in itself. It is also naive to think that IT System Integrators on their own in 18 Months can deliver a fully integrated and functional system and the Utility can take over and realize gains soon after. IT system integrators in India who have won many of these projects do not have ground up expertise in implementing such large projects in India or outside. Handling real time data and completion time i.e. 18-36 months is a huge challenge with this project. Many other challenges like lack of coordination between governing bodies, data availability and accuracy, aggregation and assimilation of data from multiple sources and formats, data interoperability, standards based approach towards developing spatial data infrastructure, flexibility in use of open source software and business software solutions are also huge challenges.

4. RESTRUCTURED ACCELERATED POWER DEVELOPMENT & REFORM PROGRAMME IN ASSAM

4.1. Overview of ASSAM Power Sector

Government of Assam (GoA) embarked upon power sector reforms to make the sector commercially and financially viable. It will also ensure generation of electricity in adequate quantity to be supplied to the residents of Assam in an efficient manner and at a reasonable price. The Assam Power Sector Development programme follows the enactment of the Indian Electricity Act, 2003 and emphasizes the disaggregation of the Assam State Electricity Board (ASEB) into five distinct corporations (Generation, Transmission and 3 Distribution Companies). The following Table 1 shows the brief profile of Assam State/Utility.

Table 1: Financial/Commercial Information of APDCL.

Particulars	Information of APDCL			Information of Mangaldoi			
	Unit	Previous FY-1	Previous FY-2	Previous FY-3	FY-2009-10	FY-2008-09	FY-2007-08
Energy Input	MU	4391.98	4041.40	3717.48	19.35	18.41	17.75
Metered Energy Sales	MU	3240	3043.00	2649.00	12.1	11.30	10.50
Assessed Energy	MU	7.32	9.97	15.25	0.2	0.20	0.20
Total Energy Billed	MU	3247.32	3052.97	2664.25	12.3	12.30	12.30
Revenue Billed	Rs. Cr	1463.19	1331.01	1196.80	4.453	3.97	3.89
Revenue Collected	Rs. Cr	1421.74	1289.91	1191.33	4.41	4.05	4.05
Billing Efficiency	%	73.94%	75.54%	71.67%	64%	66.81%	69.30%
Collection Efficiency	%	97.17%	96.91%	99.54%	99%	102.02%	104.11%
AT&C Losses	%	28.16%	26.79%	28.66%	37.0%	31.84%	27.85%

ASEB has therefore incorporated five successor companies, viz. Assam Power Generation Corporation Limited (APGCL) to undertake generation business, Assam Electricity Grid Company Limited (AEGCL) to take up the functions of the State Transmission Utility and three geographically- segregated Distribution Companies (Discoms) to take over the Distribution process. The Discoms are Lower Assam Electricity Distribution Company Limited (LAEDCL), Central Assam Electricity Distribution Company Limited (CAEDCL) and Upper Assam Electricity Distribution

Company Limited (UAEDCL). The total number of consumers of Assam Power Distribution Company Limited (APDCL) was 1609000.

4.2. Proposed Project of Mangaldoi to be cover under R-APDRP

APDCL has decided to include Mangaldoi for funding under R-APDRP for objective e.g. reduction of AT&C losses to a level of 15% or below, enhancement of system reliability, increased quality of supply, improved customer satisfaction etc.. Proposed Project Area has already been Sanctioned under Part-A of the R-APDRP. Proposed period of completion of the project was 36 months. Mangaldoi town is in Darrang district with 42 Sq. Km with 15465 consumers and population of 23920 as per 2001 census. The scheduled date of completion of project is 13.01.2014. R-APDRP Part B consultant is NPTI with cost of Rs. 4.934 Cr. and scheduled date of completion of project is 31.7.14

The main schemes proposed for Part B through this to the selected town are; augmentation of existing LT lines, installation of new DTs, renovation of old existing DTs, installation of capacitor bank, extension of HT lines, replacement of electro-mechanical meters with electronic meters, replacement of service cables, installation of Mobile DTs. Distribution transformer is the node at which the LT network starts. An old or overloaded transformer or associated LT network leads to losses. One of the aims of the load flow study was to identify these transformers and suggest a capacity augmentation or a complete replacement by a new transformer at that particular location. As per the load flow study, physical survey and consumer demand calculated based on connected load for next 8 years, new areas have been found and new DTs of varying capacity have been proposed to cater the demand. The existing DTs which were found overloaded have been proposed for augmentation in the most economical way with the right rating of DT. The DT's capacity has been chosen by considering both the present demand and the forecasted future growth in demand. Summary of Project Cost (Bill of Quantities) for 11 KV Line: New Feeder Bifurcation, 11 KV Line: Reconductoring/Augmentation, Renovation & Modernization of 33/11 KV SS, Installation of Distribution Transformer, LT Line: Augmentation, Metering and Others is 102.76, 39.81, 3.92, 42.98, 158.19, 19.78 & 126.00 Lac rupees respectively with total cost of 493.4 Lac rupees.

4.3. Expected Project Benefit

It is envisaged that with implementation of the project the AT&C Losses which was 37.05% in base year shall be reduced progressively in years' 1, 2, 3, 4, 5 and 6 by 30.00%, 25.00%, 20.00%, 15.00%, 15.00% and 15.00% respectively. Some other project benefits are; line loss reduction, ensuring better accounting, better voltage profile, decrease in the DT failure, curbing the theft/pilferage/and unaccounted usage, reliability of supply, reduction in commercial losses, serving load growth. Expected incremental benefit in years' 1, 2, 3 and 4 will be 0.49, 0.84, 1.19 and 1.20 Rs. Crores respectively.

5. CONCLUSION

In this paper power sector reform activities, initiated in the state of Assam, have been discussed. It can be concluded that on a real-time basis, the R-APDRP, if successfully implemented, will result in a power utility getting a good understanding of where its power supplies are going, what are the loss levels and what is its consumer profile. The

distribution sector, which was not well attended to, is now in focus. The Ministry of Power has been more active since 2001 and has initiated many new schemes. New technologies such as IT applications and AMI (Advanced Metering Infrastructure) will play an important role in managing the future needs of the distribution sector.

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