

# Quality of Service of Distribution Utilities

– Need for End to End Commitment

प्रयास

आरोग्य, उर्जा, शिक्षण आणि फालकत्व

या विषयातील विशेष प्रयत्न

Prayas Energy Group, Pune

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## **Prayas Occasional Report – 1/2005**

### **Quality of Service of Distribution Utilities – Need for End to End Commitment**

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## ABBREVIATIONS

AE	Assistant Engineer
APDRP	Accelerated Power Development and Reform Programme
APERC	Andhra Pradesh Electricity Regulatory Commission
ARR	Annual Revenue Requirement
CAIDI	Consumer Average Interruption Duration Index
CAIFI	Consumer Average Interruption Frequency Index
CE	Chief Engineer
CEA	Central Electricity Authority
CESC	Calcutta Electricity Supply Company (now called CESC Limited)
CII	Confederation of Indian Industry
DE	Divisional Engineer
DERC	Delhi Electricity Regulatory Commission
DISCOM/DISTCOM	Distribution Company
DT	Distribution Transformer
E-Act	Electricity Act
ERC	Electricity Regulatory Commission
FOIR	Forum of Indian Regulators
GERC	Gujarat Electricity Regulators
GRF	Grievance Redressal Forum
HERC	Haryana Electricity Regulatory Commission
KERC	Karnataka Electricity Regulatory Commission
MAIFI	Momentary Average Interruption Frequency Index
MERC	Maharashtra Electricity Regulatory Commission
MIS	Management Information System
NERC	North American Electricity Reliability Council
OERC	Orissa Electricity Regulatory Commission
Ofgem	Office of Gas and Electricity Markets (UK)
PBR	Performance Based Regulation
QoS	Quality of Service
RERC	Rajasthan Electricity Regulatory Commission
RoR	Rate of Return Regulation
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SE	Superintending Engineer
SERC	State Electricity Regulatory Commission
SoP	Standard of Performance
TNERC	Tamil Nadu Electricity Regulatory Commission
TRANSCO	Transmission Company
TRAI	Telecom Regulatory Authority of India
UPERC	Uttar Pradesh Electricity Regulatory Commission
WBERC	West Bengal Electricity Regulatory Commission

## **ABSTRACT**

One of the features of the Indian power sector reforms is the increased attention to the distribution sector. Systems and procedures for monitoring Quality of Service (QoS) of distribution utilities have been finalised by State Electricity Regulatory Commissions, especially subsequent to the Electricity Act 2003. This Prayas report reviews the QoS process of distribution utilities.

Report gives an overview of the QoS process consisting of Grievance Redressal Forum, Ombudsman and Standards of Performance regulations. As many as 18 states (of the 28) have finalised regulations on grievance forum and 11 states on standards of performance. Details of the QoS process in the state of Andhra Pradesh as a case study is given, followed by a comparative study of 11 states.

Systems to improve consumer interface, quantify performance and to monitor progress in a transparent manner are necessary and welcome steps. QoS process meets one of the many long felt needs to improve distribution sector. At this initial stage, it is crucial that the distribution utilities and regulatory commissions show serious end to end commitment in the QoS process. This includes the steps of formulating the system, reporting performance, monitoring progress and taking corrective measures. It is also important to proactively work for the active participation of consumers at all stages of the process. With such an approach, over the years, QoS process can evolve to be the necessary and sufficient condition for continuous improvement of the distribution sector.



# 1. INTRODUCTION

Indian power sector has been undergoing 'reforms' from the 1990s. Starting from the introduction of private companies into generation, there has been major paradigm shifts in ownership, utility structure and policy. In many ways, the Electricity Act 2003 has been a consolidation and culmination of this process. To some extent, the State and Central Electricity Regulatory Commissions have helped to increase transparency, accountability and participation in the working of utilities [1]. This has been through measures like draft discussion papers, public hearings, consumer charters, advisory committees, grievance redressal forums, electricity ombudsman and regulations on standards of performance.

One key aspect to note is the increasing attention given to the distribution sector. Distribution is the first interface of the utility with the consumer, the source of revenue and a major instrument of government policy. But this sector has not received the attention it deserves in terms of investment or performance analysis. A balanced proportion of investment between Generation and Transmission & Distribution is 1:1 -1 for generation and 1 for transmission & distribution<sup>1</sup> [2]. The actual ratio of state investment has been more like 2:1, but is reported to be improving in favour of transmission & distribution from mid 90s. While many states and the Central Electricity Authority (CEA) have been preparing annual reports on performance of generating stations, it is only recently that CEA has announced a report on performance of distribution utilities in India. Reasons cited for this neglect of analysis of distribution sector include lack of credible data. T&D loss, percentage of billing & collection and revenue arrears are the few performance indices of the distribution sector which have gained attention in the past few years. Distribution

Systems and procedures to ensure that financial performance is not achieved at the cost of quality are essential. Therefore, regulatory measures to improve quality of service are welcome steps, helping the consumer to get better service from the utility.

sector also has the dubious image of insensitive consumer interfacing, corruption and inefficiency at all levels. But it is good to notice a strong sense of realisation that a performing distribution sector is crucial to improve the power sector. Accelerated Power and Distribution Reforms Programme (initiated by Ministry of Power in 2001), the committees on distribution reform, corporatisation/privatisation of distribution in some states and the initiatives towards improving the quality of service are some indicators of this increased attention. One of the results of this focus on distribution has been the increased attention to quality of consumer service. Public declaration of Citizens' charter (on performance and service), formation of consumer Grievance Redressal Forum/Electricity Ombudsman and regulations on Standards of Performance are all the result of this increased focus.

Financial performance of the utilities has been a key focus of the reform program. The current method of regulation employed for tariff setting – rate of return regulation (ROR) – does not provide for penalties or rewards based on quality of service. Some attempts to use performance based regulation (PBR) have been made in India, for example in Delhi. But PBR has its own problems related to relative benchmarking of performance. Many question the efficacy of using benchmarking for tariff fixation. As a paper from the

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<sup>1</sup> The suggested proportion, as per the Rajadhyakha committee report is 4:2:1:1 for Generation: Transmission: Distribution: Rural electrification

American consulting firm NERA observes: *'Benchmarking for ratemaking ... would be extremely burdensome. Regulators who attempt to simplify the methodology to make it manageable risk making arbitrary judgements that confuse inefficiency with heterogeneity'* [18].

It is also not right to assume that quality issues will automatically be addressed by competition. As a report of the South African regulator (NER) notes: *'In an ideal world, power quality levels would be determined by competition in the supply industry. However, given the nature of the electricity supply industry, some regulatory requirements on power quality will probably be necessary'* [11]. We are far from ideal world or ideal competition. NER report also quotes from a study by European regulators: *'Where market competition replaces monopoly regimes, quality competition should replace quality regulation. However, complete withdrawal of the regulator is not usually possible because, while some quality factors can be individually negotiated, others cannot'* [11]. This approach is also supported by another European regulator survey (Energy Regulators Regional Association – ERRA), which observes: *'The measurement and control of quality of supply is one of the means to protect consumers against possible abuses of market power. Quality regulation can ensure that cost cuts are not achieved at the expense of quality'* [10].

In the Indian context, even today affordable access is one of the major challenges for the distribution utility. Poor public image of the consumer interface, badly maintained infrastructure, top-down & personality driven approach and rampant corruption at all levels are some of the major obstacles in the path to achieve it. Arriving at a right mix of performance indices with the optimum level of detail that can be supported by data and a monitoring system that facilitates transparency, accountability & participation can help in the turnover of the utility.

With these considerations, systems and procedures to ensure that financial performance is not achieved at the cost of quality are essential. Therefore, regulatory measures to improve quality of service are welcome

steps, helping the consumer to get better service from the utility. However, like all initiatives, an end-to-end commitment from planning stage to implementation stage is essential to ensure effectiveness. It should also be noted that these measures would yield the desired result only if these are fully utilised – which in turn can happen only with active participation of public interest groups. As an effort to explore this aspect, this Prayas Occasional Report focuses on the measures to improve the quality of service of Distribution Utilities in India. Efforts in the post-reform period are reviewed, with more details on the progress after the Electricity Act 2003 (E-Act). This report is largely based on information available in the public domain – consolidated from the publications and websites of the regulatory commissions and distribution utilities.

The next section of this report gives a background of the procedures and systems towards ensuring Quality of Service (QoS). Grievance Redressal Forum (GRF), Ombudsman and Standards of Performance (SoP) regulations are covered. Section 3 gives details of the SoP regulation and the Grievance Redressal Forum/Ombudsman regulation for a typical state, Andhra Pradesh. Section 4 looks at 10 other states for the purposes of comparison. States covered are Orissa (the first state to have a state regulatory commission and a SoP regulation), Karnataka, Maharashtra, Haryana, Uttar Pradesh, Gujarat, Rajasthan, Delhi, Tamil Nadu and West Bengal. Many Indian utilities have looked up to British systems and procedures to formulate their own regulations. The case of QoS regulations is no different. With this idea, a brief preview of the performance regulations of Ofgem (Office of Gas and Electricity Markets, UK) is also given. The last section has some comments and conclusions aimed at improving the process, since we feel that this is indeed a welcome step with lot of potential.

A few general points about this report: Data in this report is updated as of June 2005. Throughout this report, the term 'distribution utility' has been used to denote 'distribution licensee' also. The term 'Quality of Service' (QoS) is used throughout to address the issue of 'Quality of Supply and Service'.

□

## 2. OVERVIEW OF THE QOS PROCESS

### 2.1 Introduction

The Indian Electricity Rules (1956) does give few power supply quality indices<sup>2</sup> and some utilities have come out with citizens' charters stating quality and service commitments to consumers. Many utilities have consumer grievance handling procedures and the some have the practice of holding open consumer courts. There have been some consumer surveys and few studies on quality of service in the power sector (see Annexure 1.1- Consumer Surveys and Quality of Service studies). These have helped to gain understanding of the issues related to quality of service.

All the existing mechanisms to improve quality of service address only few issues in this area. Comprehensive regulations on Standards of Performance (SoP) for distribution utilities have been prepared from 1998 by some state RCs. They cover many aspects of quality of supply and service (hereafter referred as Quality of Service – QoS). Subsequent to the Electricity Act, many RCs have prepared regulations on Consumer Grievance Redressal Forum (GRF) and Ombudsman. These regulations comprehensively cover consumer grievance handling procedure, supply quality and service indicators, performance targets, benchmarks and compensation aspects of distribution utilities.

As of March 2005, 24 of the 28 states have formed SERCs. 18 of the RCs have come out with regulations on GRF and 11 with regulations on SoP. Table A3.1 (in Annexure 3) gives a list of states, with date of formation of RC, website address of the RC, date of GRF/Ombudsman regulation, date of first version of SoP regulation and date of recent version of SoP regulation. This table is prepared mostly from information available at the respective RC websites and reflects the status as of May 2005.

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<sup>2</sup> Some quality indices from IER: Voltage of supply to be within +/-6% for Medium Voltage, +6/-9% for HT, +/- 12% for EHT (Rule 54); Frequency to be within +/- 3% (Rule 55)

### 2.2 Grievance Redressal Forum and Ombudsman

Section 42 of the E-Act[1] gives the duties of distribution licensees. Subsections 5, 6, 7 and 8 cover the setting up of Grievance Redressal Forum (GRF) and Ombudsman for the distribution licensees. These are mandated to be done within 6 months of the Act (June 2003) or 6 months of granting (new) license. Clause 5.13.3 of the National Electricity Policy [22], notified by Ministry of Power in February 2005, advises all SERCs to formulate regulations for GRF/Ombudsman and appoint them within 6 months. Accordingly, GRF and the institution of Electricity Ombudsman have been set up in some states (Orissa, Maharashtra are examples). GRF is 2-4 member body. There may be one GRF per zone (as in MSEB with 12 GRFs) or one per circle for each licensee (2-3 per DISTCOMs, in Orissa) or it can be one per licensee. GRF is set up by the distribution licensee and typically has retired judges, working/retired utility employees, lawyers and in most cases consumer activists as members. After exhausting the normal complaint procedure of the licensee, any consumer can approach the GRF. GRF regulations provide typical timeframes for disposing the complaint (45-60 days). Consumer can appeal to the Ombudsman, if she/he is not satisfied with the GRF. It is an important point to note that only the consumer can appeal against the decision of the GRF.

Ombudsman is an institution to be appointed by the State Electricity Regulatory Commission (SERC). There can be one or more Ombudsman for a distribution licensee. Ombudsman itself can be having one or more members, though, in most cases, it is expected to be a one-member body. Senior persons with expertise in legal, engineering, education, industry, administration or consumer affairs are expected to be appointed as Ombudsman. Any consumer can appeal to the Ombudsman if he/she is not satisfied with the order of the GRF. Ombudsman has the power to call for documents and is expected to settle the dispute within about 3 months.

GRF is funded by the utility and Ombudsman by the SERC. Of course, money for this is raised from the

consumers. GRF and Ombudsman are expected to submit annual reports of their functioning – GRF to utility and SERC, Ombudsman to the SERC. With good consumer participation, support of utilities and supervision by Regulatory Commissions, these can go a long way to bring consumer empowerment and change of utility’s perception, leading to improved consumer satisfaction.

### 2.3 Standards of Performance regulation

Few Standards of Performance (SoP) regulations, prepared before the E-Act were based on the respective State reform Act or the Central ERC Act 1998, under which State RCs were formed. Some of the states like Orissa, Haryana, AP and Karnataka had prepared SoP regulations under this framework (see SoP-1 in Table-A3.1).

Subsequent to the E-Act, as mandated by the Act, many more states have prepared SoP regulations and many states have revised their previous regulations. Sections 57,58 and 59 of the E-Act cover SoP for distribution licensees. E-Act mentions the need for SoP regulation, need for compensation (if the licensee does not meet the SoP conditions) and the need for licensees to report level of performance. These regulations are typically 10-15 pages long. Structure of the regulation is different for each state, but the contents can be broadly divided into 5 parts – performance indicator, performance target, overall performance benchmark, compensation and other issues. These are briefly outlined below.

#### i) Performance Indicator

Performance indicators can be divided into 4 groups:

- a. Distribution network
- b. Metering & Billing
- c. New connections
- d. Other

Network indicators relate to the reliability and quality of power supply. Reliability indicators include duration for supply restoration, notice for power cuts, monthly/yearly outage statistics etc. Power supply quality indicators include supply voltage variation, frequency variation, harmonic content etc. Metering indicators include time taken to attend to faculty meters and Billing indicators relate to handling billing complaints. Indicators related to new connections include the response to applications for new connections or modifications in existing connections. Other indicators include accidents, complaint letters etc. A typical SoP regulation has 30 - 40 indicators.

#### ii) Performance Target

For each of these indicators, SoP regulation gives a performance target. For example: A fuse-off call in urban area will be attended within 4 hours; a voltage problem will be sorted out within a week if there is no network change involved; new connection for LT will be released within 30 days if no network change is involved. Utility has to pay compensation to the consumer if this target is not met. Many regulations call this as the ‘Guaranteed Standards of Performance’.

#### iii) Overall Performance Benchmark

For each of these indicators, SoP regulation also gives an overall performance benchmark. This is to measure the performance of the utility with respect to an indicator meeting the specified performance target over the period of time - 1 year or 1 month. For example: Fuse-off calls in urban area will be attended within 4 hours *for 99% of the complaints*; voltage problems will be sorted out within a week if there is no network change involved *for 90% of the complaints*; new connection for LT will be released within 30 days if no network change is involved *for 95% of the applications*. Many regulations call this as the ‘Overall Standards of Performance’.

#### iv) Compensation

Another feature of the SoP regulation is the compensation to the consumer if the performance target is not met. Utility is expected to pay the consumer if such default happens. For example: A fuse-off call in urban area will be attended within 4 hours – *Rs. 50/ to be paid to the consumer in case of default*; a voltage problem will be sorted out within a week if there is no network change involved - *Rs. 100/ to be paid to the consumer in case of default*; new connection for LT will be released within 30 days if no network change is involved *Rs. 50/ day to be paid to the consumer in case of default*.

#### v) Other issues

All licensees are expected to have a well publicised procedure to receive and record complaints. This could be phone numbers (like 1912 in AP), complaint registers and written complaints. Compensation is to be given automatically in some cases and on consumer demand in some other. There are of course some exceptions for utility like natural disasters, factors not in utility control, review with RC etc. Licensees are expected to give periodic reports on supply and service indicators to the Regulatory Commission.

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### 3. QOS PROCESS IN ANDHRA PRADESH (A CASE STUDY)

It is required to look in detail at least one set of State level regulations and systems to understand the QoS process. In this section, the QoS process in Andhra Pradesh (AP) state is described, as a case study example.

Andhra Pradesh (AP) is considered one of the most 'reforming' states. The World Bank supported reforms were initiated in AP in 1997, after Orissa and Haryana states. SERC was constituted in March 1999 and the power sector unbundled into 6 state owned corporations (APTRANSCO, APGENCO and 4 DISCOMs) in April 2000. Private generation, under the IPP process has been active in the state with 4 working projects having a total capacity of 1000 MW and 4 more under construction with a capacity of about 1500 MW. Unlike Orissa, privatisation of distribution. (as planned in the reform programme) was not carried out. Quoting high interest and unacceptable conditions, the 5 stage World Bank loan was suspended by the State in 2003, after the first stage.

APERC has been regular in issuing tariff orders, having issued an order per year from June 2000. The distribution companies have done well in reducing losses and improving quality of service, especially in urban centres. Upto June 2005, APTRANSCO was responsible for power purchase and coordination of all DISCOM operations. From June 2005, power purchase function has been transferred to DISCOMS. APGENCO has been getting performance awards for its generating stations. In the power sector rating process of CRISIL/ICRA started in 2003, AP power sector stood first in 2003, 2<sup>nd</sup> in 2004 and 1<sup>st</sup> again in 2005<sup>3</sup>.

#### 3.1 The internal mechanisms

The internal grievance redressal mechanism of the distribution utilities in AP include consumer rights statement (APERC, 2002), citizen charter (released by

<sup>3</sup> It should of course be noted that this rating process is heavily linked to the investment climate in the State

the utilities - see Box 1), centralised complaint booking facility (e.g. Centralised complaint number - 1912 for DISCOMs), consumer service centres and periodic public meetings (Adalats) conducted with consumers to sort out complaints.

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#### Box 1: AP Citizen's Charter

The idea of Citizen's Charter was initiated by MoP in 1999, when a model charter was released. The AP Citizen's charter begins with:

*The aim of Transmission Corporation of Andhra Pradesh Ltd. (APTransco)/Discoms is to declare publicly, the service assurance given to the customers, who pay their bills regularly, for power and utility services from APTransco/Discom.*

Citizen's charter commits time limit for handling fuse off calls, voltage problems, meter & billing complaints, new connections etc. It gives formats for applications, complaints and details of officers who should be approached for filing complaints. Posters with a summary of this charter were widely distributed throughout the state.

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The first regulation on Standards of Performance (SoP) was notified by APERC in September 2000. This regulation covers quality of service indicators and time limits for responding to consumer complaints. Areas covered are: I) Restoration of power supply, II) Quality of supply – voltage & frequency, III) Period & notice of scheduled outages, IV) Meter complaints, V) Application for new connection/modification and VI) Billing complaints. Details of 29 performance indicators spread over these 6 areas are given in Table A3.2.

It can be seen that there is no compensation to the consumer if the target time limit is not met by the utility and there is no overall performance benchmark. The regulation also does not require utility to file reports on standards of performance. Subsequent to the E-Act, a modified SoP regulation was prepared, as detailed in section 3.3. Regulation on Grievance Redressal Forum

and Ombudsman was also prepared after the E-Act, as described in the next section.

### 3.2 GRF and Ombudsman

Table A3.3 summarises the AP Regulation on Grievance Redressal Forum (GRF) and Ombudsman. APERC prepared a draft regulation in November 2003 and invited suggestions from general public, consumer groups and utilities. The final regulation was prepared in February 2004.

APERC notes in the introduction of the regulation that all distribution utilities already have a complaint handling procedure. GRF is an additional forum, which the consumer can approach if he/she is not satisfied with this procedure or even without going through that. APERC also notes that by and large, GRF is an internal forum of the utility. The provisions of having a co-opted member from a consumer group and the clauses to ensure transparency are expected to give some objective status to the forum.

#### 3.2.1 GRF

Every distribution utility is expected to set up GRF, in addition to the existing complaint handling mechanisms. The GRF regulation suggests setting up one GRF/utility. After an initial review, if consumer complaints are not sorted out in 45 days, utility can consider setting up more GRFs. As can be seen from Table A3.3, each GRF has 4 members, appointed by the utility. Qualifications of the members ensure that technical, financial, legal and consumer expertise is present in the GRF. All members, except the co-opted one are expected to be serving or retired employees of the utility. The idea of having a GRF member from the consumer groups is indeed welcome. But relegating the member to a co-opted position and not giving voting right is disappointing. As seen in Section 4.2 and Table A3.5, many states have the provision of having consumer group representative in the GRF with voting rights. GRF members have a fixed tenure of 3 years giving them some stability. Procedure for removal of members calls for significant failure on the part of the member and can be done after a due enquiry. Age limit of the members is 62 years and there can be no re-appointment. Vacancies are expected to be filled in 2 months. GRFs are expected to file regular reports to the utility and the SERC. The complainant (not the utility) can appeal against the decision of the GRF to the Ombudsman.

Initial steps for setting up GRFs were taken in February 2005 with one GRF per DISCOM and some of the GRFs are functional. But the general awareness of GRFs is poor in the State as of now. Information about GRFs is not available on the websites of the DISCOMs (as of June 2005) and there has been very little publicity about them in the media.

#### 3.2.2 Ombudsman

The institution of Ombudsman is called 'Vidyut Ombudsman' in AP. Considering the fact that areas like banking, insurance and stock exchange already have their own 'ombudsman', giving a separate name is welcome. The initial regulations giving the broad functions of Vidyut Ombudsman was released by APERC in February 2004, but another one giving details of appointment and terms & conditions is in draft stage. Therefore, Vidyut Ombudsman is still not appointed by the APERC (as of June 2005).

Table A3.3 gives summary of the provisions of the two regulations of Ombudsman. Every distribution utility may have one Ombudsman each or one may handle two or more utilities. Vidyut Ombudsman is expected to be a single person institution with a support staff of 4. Its office is expected to be located at Hyderabad with the provision that hearings may be held at other places in the State. A fairly senior person with long years of experience (as given in Table A3.3) is expected to be selected by the APERC. A 3-year fixed term is specified with no re-appointment. Age limit is 65 years and SERC can remove the Ombudsman after an enquiry finds fault.

Appeals to Ombudsman can be filed by a complainant within 30 days of decision by the GRF. Appeal can also be given if the GRF does not give any decision on a complaint within the stipulated 45 days. Ombudsman is expected to try for a reconciliatory settlement after hearing both the complainant and the utility. The final decision by the Ombudsman is expected to be given within 90 days.

### 3.3 SoP regulation

APERC published a draft SoP regulation, subsequent to the E-Act, seeking comments from public and utilities. Subsequently, the SoP regulation was notified in June 2004. This regulation differs from the earlier one in three main aspects: 1) there are more performance indicators;

2) utility has to pay compensation to the consumer if the performance target is not met and 3) an overall performance benchmark is specified for performance indicators. Table A3.4 gives the details of 39 indicators distributed over 4 areas- I) Restoration of power, II) Quality of supply, III) Metering & Billing and IV) New connections/modifications.

Time target is the maximum time the utility is expected to take to rectify the fault after it receives a complaint. In the SoP regulation, this is called the guaranteed standard of performance. In cases involving consumer payment (e.g. new connection), time target is the time taken after all formalities and receiving payment. Utility is expected to register every complaint and give a complaint number to the consumer.

The fourth column gives the compensation payable in case of default. The amount given is for the situation when a single consumer is affected. In case of power breakdowns or voltage problems, when more than one consumer is affected, the compensation payable to each consumer is half the respective amount. For example, if a DT failure in a rural area is not attended within the stipulated 48 hours, if many consumers are affected, each of them will get Rs.50/-. Provision of paying compensation is effective after 3 months of notification (June 22, 2004), urban areas and 1 year in rural. It is to be paid by the utility as adjustment of bills within 90 days from the date of default. If the utility does not pay this amount, consumer can approach the GRF.

The last column gives the overall performance benchmark in percentage. This value is the percentage of complaints satisfactorily attended within the time limit. For example, 99% of the fuse-off complaints from urban areas are to be rectified within 4 hours. The period used for calculation of this is not explicitly stated, but it is expected to be 1 year. The SoP regulation gives these benchmark values in Schedule III, 'Overall standards of performance'. This section also gives permitted variation for frequency, voltage unbalance, billing mistakes and faulty meters. These are given in the Notes below Table A3.4.

The AP regulation suggests using 3 supply reliability indices SAIFI (System Average Interruption Frequency Index), SAIDI (System Average Interruption Duration Index) and MAIFI (Momentary Average Interruption Frequency Index). These are typical reliability indices related to consumer supply, calculated using annual field

data. See Annexure 2 for the standard definition of these indices. The AP regulation (and as seen subsequently, all other State regulations) use these indices in the feeder context, with some change in the formula for calculation. Thus SAIFI, SAIDI and MAIFI refer to 11 kV feeder interruptions (not consumer interruptions) and the index is calculated using one month data (not annual data). The interruption is also given a weightage, based on the connected load on the respective feeder. To illustrate using the case of SAIFI:

$$SAIFI = \frac{\sum (\text{Connected load of feeder} \times \text{Number of sustained interruptions of this feeder in the month})}{(\text{Total connected load on all feeders})}$$

It can be seen that this is not an average value, since the total number of interruptions is not used in the calculation. SAIFI as calculated here is the weighted total number of feeder interruptions, i.e., the sum of individual feeder interruptions weighted by the proportion of load it carries. Thus, it cannot be used to compare reliability figures of two utilities which have different number of feeders.

Indices for rural and urban feeders are to be calculated separately. Feeders serving predominantly agriculture loads are excluded from the calculation and indices for those are also to be separately calculated. Since these calculations are new, the regulation does not suggest any target values for these indices.

Considering the lack of reliable data on consumer interruptions, it is a good idea that SoP regulation suggests using feeder interruption data to calculate reliability. But then, it was perhaps not necessary to employ jargon like SAIFI, SAIDI etc, especially since the formulae suggested are not as per the standard (given in Annexure 2). Calculating the average duration and frequency of 11 kV feeder interruptions, calculating the per km interruption of 11 kV feeders etc would have been easier and sufficient to assess system reliability.

The regulation gives conditions when the utility can get exemption from meeting these standards of performance. These '*regulations are suspended during Force Majeure conditions such as war, mutiny, civil commotion, riot, flood, cyclone, lightning, earthquake, or other force and strike,*

*lockout, fire affecting the Licensee's installation and activities*'. It is hoped that this clause will be used only in extreme cases and not for any storm or lightning, which in fact are the times when it is critical for consumer to get good service<sup>4</sup>. It shall also not apply if the violation of the regulation is due to *'grid failure, a*

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**Box 2: QoS Reporting in ARR by DISCOMs [3]**

The amount of data and the level of analysis of QoS indicators in the ARR submissions are not comprehensive or complete. In the ARR submissions made in November 2004, all the 4 DISCOMs in AP gave data related to 11 kV and 33 kV system (mainly feeder outages), number of pending applications for new connections, accidents and defective meters (Sections 7.8 to 7.12, ARR for 2005-6). Only one DISCOM (NPDCL) gave the outage data of the LT network, and that too for urban areas (Table 11.a.3, ARR for 2005-6). This covered number of complaints received and time taken for rectification – maximum, minimum and average – for individual fuse off, service wire defect, LT fuse off, LT line fault, HT fuse off and DT failure in urban areas. A cursory analysis shows that over 35,000 individual fuse off calls were received in the year 2003-4 from towns and municipalities in NPDCL. The maximum time taken to rectify them was 9 hours and minimum was 6 minutes. Average was about 2 hours. Compared to this, the 4 hour time limit for urban fuse off rectification in the SoP regulation looks very comfortable. The number of DT failure complaints was about 600 in 2003-4. Minimum time for rectification was 75 minutes and maximum 24 hours. Average was around 5 hours in most towns, but was 15 or 18 hours in some. The SoP time limit for rectifying DT failure in urban areas is 24 hours.

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*fault on the Transmission Licensee's network, or on account of instructions given by SLDC, over which the Distribution licensee has no control*'. In a 3<sup>rd</sup> clause, the Regulatory Commission may absolve the licensee from compensating the consumer for any default, after hearing the Licensee and the affected consumers. RC can give such an order, if it is satisfied that the reasons for the default are not *'attributable to the Licensee and the further that the Licensee has otherwise made efforts to fulfil the obligations*'. These are the 3 escape routes for the utility provided in the regulation. These can be justified provided that they are used in the right spirit to handle uncontrollable situations and not as an excuse to avoid accountability.

Utilities are expected to report the status of SoP implementation to the APERC. The regulation specifies monthly reports and annual consolidated report on committed time lines for complaint response. Quarterly and annual consolidated reports are to be filed regarding the performance targets, compensation and overall performance benchmarks. APERC has provided detailed format for providing these reports and it is understood that all utilities are filing these reports. This is a welcome step and one hopes that APERC is able to carry out detailed analysis of these reports and suggest areas of improvement to utilities. As a step towards improving transparency and participation, it will also help if these data are made available to interested public at the RC or utility websites. A part of these reports are given in the annual ARR filings submitted by DISCOMs during the tariff process. But the amount of detail given in these is quite less. They currently cover only few gross level indices like 11 kV feeder breakdowns, DT Failures, meter burnouts etc. See Box 2 on 2004 ARR filing in AP.

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<sup>4</sup> It is interesting to note that in the October 2002 storms in UK, the regulator received over 3000 consumer complaints related to standards of performance and after processing, they had to pay 1.8 million pounds – about Rs. 11 Crores – as compensation! [7].

## 4. COMPARATIVE REVIEW OF OTHER STATES

### 4.1 Introduction

This section gives a brief comparison of the ongoing QoS process in 11 different states. Regulations on GRF, Ombudsman and SoP are compared based on a few selected parameters. The objective is to initiate a discussion on possible best practices. The states chosen are:

- i) Andhra Pradesh (AP)
- ii) Delhi
- iii) Gujarat
- iv) Haryana
- v) Karnataka
- vi) Maharashtra
- vii) Orissa
- viii) Rajasthan
- ix) Tamil Nadu
- x) Uttar Pradesh (UP)
- xi) West Bengal (WB)

States with a relatively long history of regulation with many tariff orders and regulations (Orissa, Haryana, AP, Karnataka, Maharashtra, UP, West Bengal) form one group of states. Delhi (a union territory and not a State) is chosen considering the privatisation of distribution in mid 2002. Tamil Nadu is comparatively new to the regulatory processes, but is known for established systems and practices. Gujarat and Rajasthan are two other major states taken to provide more coverage. Considering that UK has been in the forefront of power sector restructuring and Indian systems have largely borrowed from UK practices, few SoP parameters specified by the UK regulator (Ofgem) for distribution utilities are also given.

Comparison is carried out for GRF, Ombudsman and SoP Regulations. For GRF and Ombudsman, key parameters like date of regulation, constitution of the

body including qualification of members and time limit for handling the complaint are compared. These are given in Tables A3.5 & A3.6 and explained in sections 4.2 & 4.3 respectively.

For SoP, comparison uses 12 parameters. These are: 1. Fuse off, 2. DT Failure, 3. Resolve voltage problem – no network change, 4. Resolve voltage problem – with network change, 5. Burnt meter replacement – licensee problem, 6. Burnt meter replacement – consumer problem, 7. Bill complaints – no additional information needed, 8. Bill complaints- additional information needed, 9. LT (non-agriculture) new connection – no network change needed, 10. LT connection title change, 11. Connection category change and 12. Effective date – for standards and compensation. Table A3.7 gives the data on SoP and section 4.4 explains the comparison.

### 4.2 Grievance Redressal Forum

Table A3.5 gives the comparative data on GRFs for 11 States. In most cases, there is a single regulation for GRF and Ombudsman. Orissa, Maharashtra, Delhi, Gujarat, AP and Tamil Nadu have formed GRFs. In half the cases one GRF is planned per utility/licensee. In other, more GRFs are formed in the state with 1/ zone or circle – Orissa has 10, Maharashtra 15 and Tamil Nadu 37 GRFs. West Bengal has planned a 3 – tier grievance handling mechanism, with district, regional and corporate level tiers. In cases where only one GRF/ licensee is planned, there is a provision to increase the number of GRFs based on consumer convenience (e.g. TN mentions less than 100 km travel) or if cases are not handled within the target time. The strength of GRF is typically 3, except in cases like AP (4) and UP (2). Typically the GRF is to be constituted from working or retired employees of the utilities and the Chair is to be a rank of SE or higher. Maharashtra, Tamil Nadu and UP regulations provide for having GRF members drawn from a wider spectrum – like judges, professors, civil servant etc. Almost all states have the provision of having one member drawn from consumer group/NGO. AP and Orissa regulations call them as co-opted members and

do not give them voting rights. In all cases, the utility has the responsibility of appointing all the GRF members, except a minor variation in the Tamil Nadu regulation, which gives the District Collector the authority to appoint the consumer representative. The West Bengal regulation gives power to the RC to remove a grievance officer, where as in other cases, utility has the power to remove a GRF member. All regulations provide the time limit for GRF to dispose the complaints and it is 45-60 days, except in Haryana, which provides 90 days.

Delhi has 3 distribution companies and each have one GRF, functioning from June 2004. Table 1 shows the details of the complaints received by the three GRFs till July 2005 [24].

It can be seen that the number of complaints are high at 1558, which works out to 43 complaints/month/DISCOM. Out of these, it is commendable to see that 95% have been disposed off and out of these 79% were in favour of consumers. It may also be noted that, of the total 1558 complaints, majority (84%) are in the area of metering & billing.

### 4.3 Ombudsman

Table A3.6 gives comparative data on Ombudsman in 11 states. Only Maharashtra, West Bengal and Delhi have formed Ombudsman, even though the regulations have been notified sometime ago. In most cases, Ombudsman is expected to be a single member institution for the whole state. The regulation has given a list of areas of expertise for the position, but it appears that a judicial background may be preferred. State Regulatory Commission will appoint the Ombudsman.

Ombudsman is expected to arrive at a compromise between the consumer and the utility to the maximum extent possible. The time limit for deciding on a case is typically 90 days. Some states (Haryana) give the provision of appeal to the SERC on Ombudsman decision. This is a debatable issue, since the E-Act does not provide for this and perhaps it is best that the SERCs are kept out of the consumer grievance issues.

Data available about Ombudsman in Delhi and CESC – Kolkotta from June 2004 for one year is given in Table 2 [24,25].

It can be seen that Kolkata had more number of complaints and most of them were admitted. (Case is not admitted if the due procedure is not followed. e.g. Utility or GRFs were not approached before). CESC has a larger backlog of cases. In Delhi, most of the cases have been decided in favour of the consumers. Similar data is not available for CESC, Kolkata.

### 4.4 Standards of Performance

Table A3.7 gives comparative data for SoP regulations for 11 states and the UK regulator Ofgem. State regulations typically cover 30-40 performance indices each. Few are chosen for comparison. Another task is to capture all the performance indicators covered in these 11 states. This is described later. A few important observations from Table A3.7 are given below.

- a. Most states have given performance targets (e.g. replacement of DT within **24** hours) and the compensation to the consumer if utility fails to meet this target. But only AP, Haryana, Karnataka,

**Table 1: GRFs in New Delhi- Complaint information (June 2004- July 2005)**

1	2	3	4	5	6	7
Total Complaints	Disposed off	In favour of consumers	Metering & Billing complaints	New Connections	Frequent breakdowns	Other
1558	1319 (85% of 1)	1037 (79% of 2)	1303 (84% of 1)	122 (7.5% of 1)	29 (2% of 1)	104 (6.5% of 1)

**Table 2: Ombudsman - Complaint information (June 2004- July 2005)**

Location	Total Complaints	Admitted	Disposed off	In favour of consumers
New Delhi	36	18	13	10
CESC- Kolkotta	101	96	52	NA

Orissa, and TN have consistently given overall performance benchmarks (e.g. DTs will be replaced within 24 hours in **95%** cases). Specifying an overall performance benchmark, reviewing the actual time taken to attend to complaints and analysing this data for different consumer groups will make it easier to monitor performance and thus help in improving it.

- b. Parameters for some performance indices are surprisingly similar for many utilities, though these utilities operate under widely different geographical conditions, load patterns, consumer mix and O&M resources. This is the case for Fuse off calls, DT failure and LT new connection. It is interesting to note that in the case of Fuse off call, most utilities have similar target figures as Ofgem (3-4 hours, compared to 3 hours of Ofgem). It is of course a good beginning to start with some numbers, since it helps in monitoring. But in a critical vein, one could wonder if the reason for similarity of figures is that very comfortable targets have been specified. A cursory comparison with the previous SoP regulations (made 4-5 years ago in cases like Orissa, AP) show that there has not been much change in the performance target figures. One has to analyse actual performance data to decide if these figures are right. If the actual performance figures of utilities are much better than those specified, then these figures need to be revised downwards.
- c. Only West Bengal has specified graded performance indices and compensation values, which change over the years. For example, urban fuse off call is to be attended within 4 hours in first year, 3 hours in second and 2 hours thereafter. The compensation for not meeting this target is Rs. 25/hr in the first year, 125 in the second and 500 subsequently. West Bengal also has different target figures during monsoon period.
- d. The amount and the mode of compensation vary a lot. In most cases, compensation is a fixed figure payable per default. But there are many cases in which the compensation increases with delay in rectification of the complaint. This can be per hour, day or week or units like per 6 hour. It would have been better to bring some common approach across all states to make this matter simpler.
- e. Payment of compensation is specified as automatic in most cases in Haryana and Tamil Nadu. In most

other states, consumer has to apply for compensation. Making the payment automatic will put more pressure on the utilities.

- f. Both the numerator and denominator has to be looked it for comparing compensation figures. Maharashtra has relatively high compensation for not attending to fuse off calls (50/hr), but low for many other cases (e.g. 100/week for burnt meter replacement, new connection) and not specified for many cases. In Gujarat and TN, compensation for fuse off is low (Rs. 25/6 hr and 50/6hr) and so is for DT failure (Rs. 25/6 hr and 50/6hr).
- g. The compensation specified by Ofgem for UK utilities is quite high. For example, converting to the same currency, it can be seen that Ofgem compensation for fuse off call is nearly 25 times that of the AP one, when the per-capita income in UK is only about 10 times that of India. One has to see if this is due to the very liberal performance parameters specified by Ofgem.
- h. SoP regulations are quite complex, with many performance indices, variety of time frames for rectification and differences in compensation. Compared to this, the Ofgem regulation has much fewer performance indicators. See Tables A3.8 and A3.9 for Ofgem details.

Tables A3.8 and A3.9 give details of the British regulator - Ofgem parameters to monitor quality of service for distribution utilities in UK. It can be seen that the number of indicators are few - 9 guaranteed standards with time targets and 6 overall standards with % benchmark figures. But from the Ofgem annual reports [9], it can be seen that the quality of data collection and rigour of analysis is quite good, perhaps because these indicators are used for performance based regulation. Many other European standards have similar structure with few indicators [10].

Table A3.10 gives a consolidation of the quality indicators included by 11 states. It can be seen that there are 54 indices spread over 5 categories (restoration of supply, quality of supply, metering & billing, new connections/modifications and other). Accident compensation, complaints on inadequate clearances, identity card for staff and keeping of appointments are some interesting indices included by some states. All regulations require SoP reports to be prepared by the utilities. Maharashtra regulation requires these reports to be made available on the utility website.

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# NOTES

## 5. ON TRACK, BUT MILES TO GO

### 5.1 Introduction

In the previous 4 sections, the background and the process of the quality of service (QoS) for distribution utilities have been covered. Efforts towards quantifying the performance indices for QoS and setting up monitoring systems have increased subsequent to the E-Act 2003. This process is being led by the State Electricity Regulatory Commissions. As a typical case, the QoS process in AP was covered in some detail – giving information about GRF, Ombudsman and the SoP regulations. Since many states have initiated the QoS process, an exercise in comparison of the provisions in the GRF, Ombudsman and SoP regulation was done covering 11 states and the UK regulator Ofgem. This and the consolidation of all the SoP indices may help to cull out the best practices.

### 5.2 QoS Process – Necessary and on Track ...

Formulation of performance indicators, reporting, incentives and awards in the generation sector have been in place for decades now. Similar systems for the distribution sector should have been in place much earlier and monitoring mechanisms stabilised. Delay in formalising can be attributed to the long neglect of the distribution sector. But it is a welcome sign that many utilities are now working on a process of systematically monitoring and improving quality of supply and service. The GRF, Ombudsman and SoP regulations have introduced **measurable quality indicators** and form a very important necessary step in this process.

Institutions of GRF and Ombudsman have the potential of making the complaint handling process of utilities more transparent and accountable. This is indeed a positive development and consumer groups should take advantage of this. A vibrant, sensitive, participative GRF can indeed go a long way to improve the public image of the utility and improve consumer confidence. It is to be seen how this new institution positions itself between the utility staff and consumers for fair handling of grievances.

Even if the regulatory mechanism does not financially reward quality supply and service, there is an important need for monitoring the quality of service of the utility. This is because of the realisation that poor quality of power supply and service are costly to society. Studies on use of voltage conditioning equipment, agriculture pump or DT burn outs have brought out this issue. The SoP regulation has introduced a variety of consumer related performance indices in place of a few macro utility related indicators like T&D loss, Aggregated Technical & Commercial loss (ATC), percentage billing & collection, total arrears etc. It is true that few consumer related indicators like 11 kV breakdowns or DT failure have been recently added to this list of macro indicators. But these macro indicators mostly relate to utility performance and improvements in these areas improve the health of the utility. And the assumption is that an improved utility provides better service to consumers. This correlation need not necessarily be true. SoP regulation, by increasing the granularity of performance measures, has the potential of mounting pressure on the utility to continuously improve consumer service in a more equitable manner. This makes sense in case of private utilities, where the consumers have no direct route to fight for accountability, as well as for public utilities where institutions for accountability have been eroded over the past many years. Of course, there has to be a balanced approach to the quality required, since quality comes with a price. This is possible with proper prioritisation of quality measures.

### 5.3 ... But little progress?

There are many indications showing the slow or poor progress in making the QoS systems effective. These could be the teething problems or due to lack of commitment of the utility and regulators. Sections below give some details.

#### 5.3.1 Poor publicity

As shown in the Karnataka consumer survey (see Annexure 1) and judging from the amount of information

in the media, awareness of quality of service processes is very poor. Number of cases registered with the GRFs are as low as 4-5/month in some cases. Utility and regulators can do much better in giving wide publicity and generating more awareness on these regulations and to undertake consumer capability building measures so that these are utilised. Websites of distribution utilities and SERC should have details of the GRF and Ombudsman – functions, procedures, contact details etc. (as done in some states). Innovative use of websites, conducting training programs, campaigns through posters or using electricity bills and wide publicity using media etc will help.

### 5.3.2 Quality of GRF/Ombudsman appointments & staff

All states should finalise the GRF and Ombudsman regulations. Positions of GRF and Ombudsman should be filled in a transparent manner through advertisements. In many states, positions of GRF and Ombudsman and supporting staff members have not been filled. They should be finalised and the offices set up. Its members need to be trained to appreciate the provisions of the relevant regulations (GRF & Ombudsman, Standard of Performance, Licence conditions, Terms & conditions of supply etc). They also need to get an appreciation of practices in states where GRFs are already functional.

At this initial stage, GRF and Ombudsman have to make significant pro-active efforts to win the confidence of the consumers as a credible institution, sensitive to their problems. Complaint registration and processing systems of GRF and Ombudsman should be transparent and open to participation by those interested. Proactive measures to address grievances of the consumer should be taken. Complaints and suggestions should be encouraged. Surveys could be undertaken to understand the consumer problems.

It is a credibility building measure to have consumer representatives as members of GRF. In this context, the provision about GRF in the recent publication of Electricity Rules by MoP in June 2005 [21] indicating that GRF members shall consist of officers (of utility) is a retrograde move. It is disappointing that the MoP is insisting that all members of GRF should be officers of the licensee, when many existing state regulations include consumer representatives and GRFs have already been set up with them as members!

### 5.3.3 Credibility of the SoP targets & benchmarks

Target and benchmark values for quality of service could have been arrived through **consumer surveys** and **study of current level of performance**. It is surprising to see similar target values for all licensees in a state and across states, when the nature of distribution system and problem vary widely (for example, urban fuse off call is to be addressed in 4-6 hours for all licensees). In these initial stages, when we depend on utilities to do self-regulation, these figures may do as starting numbers. But there is a need to collect ground level data – in terms of performance levels and problems (like complaint register details, actual time taken to attend to complaint etc) to make these performance targets and benchmarks meaningful. In addition to consumers, employees and intermediaries (like wiremen, contractors) also should be included in the survey.

It will be useful if some typical consumers (or consumer groups) are equipped with **quality monitoring and analysis tools** (like simple equipment to monitor and record presence of supply, simple computer based analysis tools) to provide credible feedback. Performance data should be made available to all those who wish to monitor and validate it through cost effective tools like web pages. These steps will help to evolve credible performance indicators over a period of time.

There have been little systematic efforts to capture SoP data, review them and have **independent validation** with a view to validate the data and improve the targets and benchmarks. The telecommunication regulator TRAI commissions independent studies on the quality of service of telephone utilities and periodically publishes reports. Ideas can be borrowed from this approach. Perhaps India needs agencies like the North American Electricity Reliability Council (NERC) of the USA<sup>5</sup>, which focus on independent monitoring of bulk power systems.

### 5.3.4 Re-look at the prioritisation of performance indices

There is also a need to prioritise indicators. At this stage, the focus could be on **consumer interfacing and group**

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<sup>5</sup> NERC is a non-profit corporation with the 10 regional reliability councils of North America as members. The members of these councils come from all segments of the electric industry: investor-owned utilities; federal power agencies; rural electric cooperatives; state, municipal and provincial utilities; independent power producers; power marketers; and end-use customers. These entities account for virtually all the electricity supplied and used in the United States and Canada.

**indicators** – complaint handling system, distribution transformer failure, feeder interruptions, tail end low voltage, etc which have impact on a large number of consumers. It is important to give high attention to good quality 11 kV metering, division / zone wise MIS reports, DT metering etc. These are ‘low lying fruits’ for improvement of quality of service - easy to measure and monitor. Improving the consumer interface including the complaint recording procedure and response to complaints are critical to build confidence in the system. For example, it is good to see the TN regulation on SoP having a performance index related to keeping consumer appointment.

The regulations could be made simpler with few essential indices and time taken to stabilise the monitoring system. This is essential to gain credibility at the initial stages. Initial measures of quality of service could even be from a mix of qualitative consumer satisfaction surveys and few measurements. After having a few measurable indices, a phased **approach** can be taken to expand the list. The approach could be guided by the initial goal of taking the whole system with a poor performance level (satisfaction level below 50% as shown by some consumer surveys – see Annexure 1) to a reasonable level of say 75%. One should not be caught in the craze to improve 99% performance levels of some urban systems to 99.99% level. It should be understood that web enabled services, bank payments, check drop facility etc, which are typically helpful to urban middle class should not be overemphasised while measuring consumer service. The idea of having difference performance targets based on geography or consumer category also needs to be explored. This is right now limited to having different indicators for rural and urban areas. But of course, it should not happen that **rural**

**quality of service** is forever neglected by giving extremely comfortable performance targets.

Complex indices like SAIFI, SAIDI, harmonic content etc can be considered much later or on a very selective basis. Method of calculation suggested also needs discussion as mentioned in section 3.3. Almost all state regulations mention these sophisticated indices to be implemented in future. There is no consistency in the methods suggested for calculating and monitoring these indicators<sup>6</sup>.

The approach towards phasing is summarised in Table 2. The first phase is related to consumer interface, the second one to quality of supply and the third one to system improvement. Phase 2 could be taken up once the required minimum systems for monitoring Phase-1 are in place and satisfactorily operational. The same applies to Phase 3.

#### 5.3.5 Joint work is a must

There could have been better joint work between the SERCs and the utilities while preparing the regulations. This could have avoided duplication of work and ensured meta level consistency. Regulations and procedures of different RCs/utilities are structured in a variety of ways with irritating minor differences. There are few minor typos in some of the regulations which could have been avoided. (e.g. AP: Resolution of complaints on consumer bill – rows are interchanged; Karnataka: Normal Fuse off rectification in urban areas is given as 6 hours in Schedule I and 4 hours in Schedule II), Some common guidelines in content & format of regulations and consensus on few key features (example – amount and mode of compensation) can even now be worked out, perhaps under the initiative of Forum of Indian

**Table 3: Phased approach to Quality of Service**

Phase No	Phase	Activities
1	Consumer interfacing	Complaint handling, bill payment, transparency of information, survey of existing performance levels, consumer issues. This phase is the essential first step for all utilities.
2	Quality of power delivery	Minimise interruptions, voltage, frequency problems. Stabilise monitoring systems. The second step, once Phase 1 is satisfactory
3	System improvement	Pro-active continuous background activities required to maintain quality of service. Transformer sizing, line maintenance, earthing, protective fencing etc. Use monitoring systems to detect abnormal system operation (overload, under-voltage etc) and to improve even complex indices like SAIFI, harmonic content etc.

<sup>6</sup> Eg. While most indicators use these indicators for feeder reliability, the Maharashtra regulation specifies SAIDI and SAIFI in the consumer context. It defines momentary interruption as those lasting 3 minutes (as against 5 in others) and uses data for 1 year for calculations (as against 1 month in others). It also mentions that data on reliability index will be made available at the RC website.

Regulators (FOIR). It will be also be useful to work out the ‘best practices’ in regulations, reporting, compliance, improvement etc based on implementation experiences. Table A3.11 is a tentative list of best practices for GRF and SoP regulations prepared by us. This includes inclusion of consumer representative for GRF; automatic compensation, benchmark values etc for SoP.

It is also important that the utilities, SERCs, GRFs and the Ombudsman continue to work in close coordination. Intra-state open access and trading are being introduced with GRFs and Ombudsman given roles of dispute resolution. These are much more complicated than consumer grievances and institutions have to be geared up to handle them.

**Table 4: Reporting on SoP status**

Reports	E-Act Provisions	State Regulations	Information available in Public domain
Reports by Utility to RC	- Section 59 (1), (2) - Level of performance targets - Number of compensation cases and total amount	- Monthly and Annual reports - Level of performance targets - Number of compensation cases and total amount - Measures taken to improve performance - Utility assessment of targets - Level of performance benchmarks - Measures taken to improve performance	- Some data in annual tariff submissions of utilities - Gross level information like feeder breakdowns, DT failures etc - No analysis/validation by RC or independent agencies - Complete data on SoP indicators not available on utility website - No data on status of cases with GRF/Ombudsman on utility website
Reports by RC	- Publish information at least once a year	- To publish information at intervals as RC deems fit	- Gross level information like feeder breakdowns, DT failures etc - Complete data on SoP indicators not available on RC website - No data on status of cases with GRF/Ombudsman on RC website

### 5.3.5 End to end commitment

Utilities and Regulatory Commissions should be serious to make QoS provisions work as pressure points on the utility performance and accountability. There has to be sincerity and openness from both, especially the utility to include consumers in the process. Reporting on SoP regulations should be detailed and available for public review.

The E-Act and State regulations require that reports on Standards of Performance are prepared. Table 4 gives the provisions in the E-Act, in the State Regulations and the current status.

It can be seen that E-Act provides a framework for reporting on SoP of utilities. Many State level regulations have elaborated on these. Some RCs like APERC have

provided detailed formats for utilities to report SoP. Part of this information (only at a gross level) is made publicly available in utility tariff submissions. Box 2 in section 3.3 covered the AP case, and similar gross level information is available in few other tariff submissions (eg. NDPL, New Delhi). Tariff orders of some RCs also provide some gross level information on SoP.

Steps to make complete data available in the public domain should be initiated. This is essential for independent analysis and validation of the data. Public interest groups should be empowered to use this data so that the QoS provisions become necessary and sufficient conditions to continuously improve distribution utility performance. All this can happen only if there is end to end commitment from the utility and SERCs at all stages- formulation, measurement, reporting, analysis, feedback and correction.

### 5.4 Miles to go

There are many indications to show that there are miles to be covered before the QoS process gains credibility in the eyes of the consumer and can start delivering.

The QoS process has gathered some momentum in the past few years and seems to be on track. Preparation of a framework for quantification of performance and creation of a system for monitoring them are two achievements. With end to end commitment of the utilities/regulatory commissions and participation by consumer groups, this can be put to good use and the objective of continuous performance improvement will be met. The QoS process can then indeed be called necessary and sufficient.

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## **ANNEXURES**

# ANNEXURE 1:

## CONSUMER SURVEYS AND QUALITY OF SERVICE STUDIES

### Consumer Surveys

There have been many consumer surveys and few studies on quality of service in the power sector. Many are related to the impact assessment and consumer perception on reforms (TARU survey in AP 2001 & 2004; INDICA survey in AP 2000; ORG Survey in MP 2001; XIM & NIRD surveys in Orissa; ERM study in Rajasthan etc). Many of these were supported by donor agencies and reports are not available in the public domain.

The Survey of electricity consumers in Karnataka, carried out by the Electricity Consumers Network, supported by the KERC [6] was conducted in 2002. It used consumer organisations to administer a questionnaire to over 5600 consumers from different categories. Questions were on service, quality, billing, metering, and general awareness. Only 18% said that the power quality was good. Half did not know about consumer charter and complaint handling procedures. 56% said that billing mistakes were rectified within a day. Only 14% had their defective meter replaced in 15 days. Many such insights are given in this study, available at the KERC website.

A Consumer satisfaction survey was conducted by ORG – MARG in UP in 2002. Results are reported in the UPERC Tariff order for 2004 [12]. 2609 consumer of different categories from 5 districts were covered. Parameters for survey were quality of supply, accessibility of supply, metering & billing and service. Each of these has further micro-parameters and feedback was obtained from consumer on the level of satisfaction. An overall consumer satisfaction index was calculated using this feedback and some assigned weightage. As per this survey, the overall satisfaction index (on a scale of 1) varied from 0.35 to 0.45. Industrial HT consumers with an index of 0.48 were the most satisfied and Commercial the most dissatisfied with an index of 0.34. The major cause of dissatisfaction was frequent interruption of supply. The same tariff order also reports the average duration of power supply in 2003: it was 9.08 hours/day for rural, 16.5 for district head quarters, 20.5 for cities and 23.4 for industry.

CII, in association with ORG MARG carried out a national level study in 2002 covering 15 states and a sample size of 3272. Consumer perception towards availability, accessibility, and affordability was studied. A Quality of Power Supply Index was calculated. The national average was 0.44, with 0.38 for North, 0.34 for East, 0.42 for West and 0.52 for South. Domestic consumers rated delays in getting connection as the main problem, commercial consumers the interruption

problems, industrial consumers the high tariff and agricultural the poor quality of supply. A second study is planned in 2005 by CII, in association with AC Neilson ORG MARG for determining corrective measures with regard to availability, accessibility, reliability, quality and affordability of power supply. [13]

Surinder Kumar in his book [14] reports a survey conducted among employees and consumers in Punjab in the mid 1990s. The sample size of 249 consumers and 99 employees is rather small. But the study is interesting in terms of the variety of questions and depth of analysis. Both consumers and employees rate low voltage as the main supply problem. For consumers, interruption problem comes a close second, whereas it is the third for employees. But interestingly, 79% of the consumers will be happy with uninterrupted power supply. Employees ask for better performance incentives. This report highlights the importance of including utility staff and perhaps even the related intermediaries like wiremen and contractors in any study of the sector.

It is reported that consumer surveys are planned (by utilities like NDPL-Delhi and some SERCs) to gauge consumer perception of quality of service and methods of improving it.

### Quality of service studies

Most of the studies so far have looked at gross level indicators like 11 kV feeder interruptions and DT failures.

CEA is reported to have recently prepared a report on the performance of 20 odd distribution utilities in India. Number of 11 kV interruptions and time taken to rectify them has been used as one benchmark. The number of urban 11 kV feeder interruptions vary from 0.004/feeder in Greater Mumbai to 15/feeder in Kochi. Time taken for rectification varies from 1.85 minutes in Mumbai to 672 minutes for BSES Rajdhani [20].

ARR submissions of some utilities (e.g. AP DISCOMs) give interruption data of 33 & 11 kV feeders and DTs. Consolidated reports (covering utilities from different states) on urban 11 kV feeder reliability are being prepared. A 2004 consolidation by Infraline [17] show 99.997% availability for BEST, 97-99% for most urban centres and 70-80% in some states like UP. The 2005 report on rating of power sector by CRISIL and ICRA [16] give some performance analysis of the Transmission & Distribution system. Pointing out the very low DT burn outs (4.5%) and the high household electrification level (85%) in Kerala are some examples.

## ANNEXURE 2:

### WHAT ARE SAIFI, SAIDI AND MAIFI? ON RELIABILITY ISSUES [7,8]

SAIFI, SAIDI, MAIFI are some of the indices used to measure distribution system reliability. Before explaining them, a little on the subject of reliability.

Reliability can be defined as the ability of the power system components to deliver electricity to all points of consumption, in the quantity and with the quality demanded by the consumer. Reliability is often measured by the outage indices defined in one international standard called IEEE 1366. (IEEE is the Institution of Electrical and Electronics Engineers, the biggest professional body of Electrical & Electronics engineers. IEEE has its head office in the USA and has presence in most countries). These outage indices are based on the duration of each power supply interruption and the frequency of interruptions. It is clear that all three major functional components of the power system – generation, transmission and distribution contribute to reliability. As far as the consumer is concerned, transmission and distribution outages are important. In fact, surveys (in developed countries) show that 80-90% of the outages experienced by consumers are caused by distribution outages.

A power supply outage is an unplanned event and can be described in terms of the frequency, duration and amount of load (or consumers) affected. A momentary outage is defined as an outage lasting less than 5 minutes, corresponding to the time taken by automatic re-closure schemes to restore temporary faults; a sustained outage lasts longer than 5 minutes (NERC 1996). IEEE standard 1366 gives the definition for outage indices. These indices are calculated using details of consumer interruptions collected from past year's or several year's data. Definitions of few of the indices are given below:

#### System Average Interruption Frequency Index (SAIFI)

SAIFI is the average number of sustained interruptions per consumer during the year. It is the ratio of the annual number of interruptions to the number of consumers.

$$\text{SAIFI} = \frac{\text{(Total number of sustained interruptions in a year)}}{\text{(Total number of consumers)}}$$

#### System Average Interruption Duration Index (SAIDI)

SAIDI is the average duration of interruptions per consumers during the year. It is the ratio of the annual duration of

interruptions (sustained) to the number of consumers. If duration is specified in minutes, SAIDI is given as consumer minutes.

$$\text{SAIDI} = \frac{\text{(Total duration of sustained interruptions in a year)}}{\text{(Total number of consumers)}}$$

SAIFI and SAIDI are the most used pair of reliability indices. A North American survey showed SAIFI figure of 1.1 (indicating 1.1 interruption/year/consumer) and SAIDI of 1.5 hours. Singapore is reported to have a SAIDI of 3 minutes. For comparison, the NDPL tariff submission for 2005-6 gives SAIDI figure of 38 hours for 2003-4 and a target of 30 hours for 2004-5 [23].

#### Consumer Average Interruption Frequency Index (CAIFI)

CAIFI is the average number of interruptions for consumers who experience interruptions during the year. It is the ratio of the annual number of interruptions to the number of consumers affected by interruptions during the year. Consumer is counted only once regardless of the number of interruptions.

$$\text{CAIFI} = \frac{\text{(Total number of sustained interruptions in a year)}}{\text{(Total number of consumers affected)}}$$

#### Consumer Average Interruption Duration Index (CAIDI)

CAIDI is the average duration of an interruption, calculated based on the total number of sustained interruptions in a year. It is the ratio of the total duration of interruptions to the total number of interruptions during the year.

$$\text{CAIDI} = \frac{\text{(Total duration of sustained interruptions in a year)}}{\text{(Total number of interruptions)}}$$

It can also be seen that  $\text{CAIDI} = \text{SAIDI}/\text{SAIFI}$

#### Momentary Average Interruption Frequency Index (MAIFI)

MAIFI is the average number of momentary (less than 5 minutes) interruptions per consumer during the year. It is the ratio of the annual number of momentary interruptions to the number of consumers.

$$\text{MAIFI} = \frac{\text{(Total number of momentary interruptions in a year)}}{\text{(Total number of consumers)}}$$

## **ANNEXURE 3: TABLES**

<b>TABLE NO</b>	<b>TITLE</b>
A3.1	STATUS OF RCs AND QOS REGULATIONS
A3.2	AP SOP REGULATION -1
A3.3	AP GRF AND OMBUDSMAN
A3.4	AP SOP REGULATION -2
A3.5	COMPARISON OF GRF REGULATIONS
A3.6	COMPARISON OF OMBUDSMAN REGULATIONS
A3.7	COMPARISON OF SOP REGULATIONS
A3.8	GUARANTEED STANDARDS OF PERFORMANCE - OFGEM
A3.9	OVERALL STANDARDS OF PERFORMANCE – OFGEM
A3.10	CONSOLIDATION OF PERFORMANCE INDICATORS
A3.11	BEST PRACTICE FEATURES IN GRF AND SOP REGULATIONS

**Table–A3.1: STATUS OF RCs AND QOS REGULATIONS**

S. No	State	Constitution of ERC	RC Website	GRF/Ombudsman Regulation	SoP Regulation-1	SoP Regulation-2	Notes
1	Andhra Pradesh	Mar-99	ercap.org	Feb-04	Sep-00	Jun-04	<p>1. NS: Not set up; NA: Not Applicable/ Available</p> <p>2. (*): Arunachal Pradesh, Manipur and Mizoram are discussing on setting up a joint RC</p> <p>3. Date given is the date of constitution &amp; functioning of RC, notification of Regulation. Data from RC websites and News reports.</p> <p>4. Private distribution utilities are not separately mentioned, since as of now, there is only one regulation for a SERC. All the utilities, including the private ones, follow these. For example, Tata Power and Reliance Energy in Mumbai follow the SoP regulation of MERC, just as MSEB does.</p> <p>5. There are 28 States in India. Delhi, a Union Territory, is also included in this table for completeness.</p> <p>6. **: Part of Supply code in UP.</p>
2	Arunachal Pradesh	NS (*)	NA	NA	NA	NA	
3	Assam	Aug-01	aerc.nic.in	Dec-03	NA	Feb-05	
4	Bihar	NS	NA	NA	NA	NA	
5	Chattisgarh	Jul-04	cserc.nic.in	2004	NA	NA	
6	Delhi	Mar-99	dercind.org	Mar-04	Aug-02	Draft	
7	Goa	Apr-02	NA	NA	NA	NA	
8	Gujarat	Apr-99	gercin.org	Aug-04	NA	Mar-05	
9	Haryana	Aug-98	herc.nic.in	Apr-04	NA	Jul-04	
10	Himachal Pradesh	Dec-00	hperc.nic.in	Oct-03	NA	NA	
11	Jammu & Kashmir	Jul-04	NA	NA	NA	NA	
12	Jharkhand	Apr-03	jserc.org	Apr-05	NA	Draft	
13	Karnataka	Aug-99	kerc.org	May-04	2001	May-04	
14	Kerala	Nov-02	erckerala.org	Nov-04	NA	NA	
15	Madhya Pradesh	Jan-99	mperc.org	Apr-04	NA	Jul-04	
16	Maharashtra	Oct-99	mercindia.com	Dec-03	NA	Jan-05	
17	Manipur	NS(*)	NA	NA	NA	NA	
18	Meghalaya	NS	NA	NA	NA	NA	
19	Mizoram	NS(*)	NA	NA	NA	NA	
20	Nagaland	NS	NA	NA	NA	NA	
21	Orissa	Aug-96	orierc.org	Apr-04	Sep-98	May-04	
22	Punjab	Apr-01	pserc.nic.in	Draft	NA	Draft	
23	Rajasthan	Dec-99	recr.gov.in	Nov-03	NA	Mar-03/Mar-04 (short amendment)	
24	Sikkim	NS	NA	NA	NA	NA	
25	Tamil Nadu	Jun-02	tnerc.tn.nic.in	Jan-04	NA	Jul-04	
26	Tripura	May-04	NA	NA	NA	NA	
27	Uttaranchal	Sep-02	uerc.org	Feb/Mar-04	NA	NA	
28	Uttar Pradesh	Sep-98	uperc.org	Dec-03	Jun-02 **	Feb-05 **	
29	West Bengal	Mar-99	wberc.net	Oct-03	NA	Draft	

**Table A3.2: APSOPREGULATION – 1, SEPTEMBER 2000**

S.No	Performance Indicator	Target Time
<b>I</b>	<b>Restoration of Power</b>	
1	Fuse off - urban	4h
2	Fuse off - rural	12h
3	Line Breakdown-urban	6h
4	Line Breakdown-rural	24h
5	DT Failure - urban	24h
6	DT Failure - rural	48h
7	Street lights - faults	24h
8	Street lights - defective	7d
<b>II</b>	<b>Quality of supply</b>	
9	Respond to voltage & frequency complaint	4h
10	Rectify complaint or reply	10d
11	Rectify if n/w upgradation needed	120d
<b>III</b>	<b>Scheduled outages</b>	
12	Notify	NA
13	Duration of outage	12h
14	Time limit	1800 hrs
<b>IV</b>	<b>Meter complaints</b>	
15	Inspect meter	7d
16	Replace defective meter	30d
17	Replace burnt meter- utility problem	7d
18	Replace burnt meter- consumer problem	7d
<b>V</b>	<b>New connection/modification</b>	
19	LT-non-agriculture -No n/w change	15d
20	LT-non agriculture - With n/w change	30d
21	LT-agriculture	30d
22	HT	120d
23	EHT	180d
24	Title transfer	30d
25	Category change	30d
26	LT Single phase to 3-phase	30d
27	HT to LT and vice-versa	90d
<b>VI</b>	<b>Bill complaints</b>	
28	No additional info needed	1d
29	Other cases	15d

Notes:

1. h= hours; d= days; NA = Not Available; urban = cities/towns with population > 50,000
2. Time limit for 14 (of 1800 hrs) implies that there should be no scheduled outage after 1800 hrs.
3. For 18 to 27, the target is after all formalities and consumer payments.
4. For 21, if connection cannot be released due to target limits, reply to be given within 30 days.

**Table A3.3: APGRF AND OMBUDSMAN**

<b>Feature</b>	<b>GRF</b>	<b>Vidyut Ombudsman</b>
<b>Regulation Date</b>	Feb-04	Feb-04, Another on appointment etc in draft stage
<b>Expected date of formation</b>	2 months after regulation or 6 months after license	Not specified
<b>Actual date of formation</b>	Feb-05	Not Formed
<b>Number in State</b>	1/ Utility = 4	4 or less
<b>Strength of each</b>	3 + 1 Co-opted = 4	1
<b>Qualification of members</b>	1.Chair: Retired/serving the utility, degree in Electrical, 20 yrs in Distribution, SE; 2. Retired/serving the utility, 10 yrs in Accounts, 5 in Revenue, Sr.Accounts Officer; 3.Retired/serving the utility, 5 yrs in Legal,Asst Secretary;4.Representative of a registered consumer organisation (co-opted)	Legal, engineering, education, industry, civil/administrative service, consumer affairs or eminence
<b>Appointment &amp; support</b>	By utility	By SERC, separate regulation in draft stage
<b>Tenure of member (Yrs)</b>	3, no re-appointment	3, no re-appointment
<b>Salary</b>	Members: As entitled. Coopted: Rs.500/day of participation	22,400-525-24,500 + DA,HRA,CCA
<b>Age Limit (Yrs)</b>	62	65
<b>Removal of member</b>	By utility after enquiry	By SERC after enquiry
<b>Maximum duration of vacancy (months)</b>	2	Not specified
<b>Complaint procedure</b>	Can be at any stage, complaint to be in writing, no fixed format, to be acknowledged by GRF and decided within 45 days	If complainant not satisfied with GRF - within 30 days of GRF decision or decision target (45 days of complaint). Ombudsman can call for documents. Decide within 90 days of complaint.
<b>Appeal</b>	Complainant can appeal to Ombudsman within 30 days of GRF decision	Not specified
<b>Reporting</b>	Quarterly to utility, SERC; Annual report by 31-May to SERC	Quarterly to SERC; Annual report by 31-May to SERC

Notes:

1. GRFs can be more if 45 day target to dispose complaint is not met
2. No voting rights for co-opted member

**Table A3.4: AP SOPREGULATION - 2**

S. No	Performance Indicator	Target Time	Compensation Rs./default	Overall Benchmark %
<b>I</b>	<b>Restoration of Power</b>			
1	Fuse-off - urban	4 wh	50	99
2	Fuse-off - rural	12 wh	50	99
3	Overhead line failure - urban	6 h	50	95
4	Overhead line failure - rural	24 h	50	95
5	Underground cable failure-urban	12 h	50	95
6	Underground cable failure-rural	48 h	50	95
7	DT failure-urban	24 h	100	95
8	DT failure-rural	48 h	100	95
9	Street light faults	24 h		90
10	Notify Scheduled outages (other than load shedding)	24 h		
11	Outage duration -maximum	12 h	100	95
12	Outage time limit	1800 hrs	100	95
13	Reliability Indices	SAIFI, SAIDI, MAIFI		
<b>II</b>	<b>Quality of supply</b>			
14	Resolve voltage fluctuation - no network change	10 d	50/d	
15	Resolve voltage fluctuation - with network change	120 d	100/d	
16	Resolve voltage fluctuation - with substation erection	As specified by RC	250/d	
17	Total Harmonic Distortion - 11 kV	8%	Effective date to be notified	
18	Total Harmonic Distortion - 33 kV	8%	Effective date to be notified	
19	Total Harmonic Distortion - EHT	3%	Effective from 1 year of notification	
<b>III</b>	<b>Metering &amp; Billing</b>			
20	Inspection of faulty meters-urban	7 d	50/d	
21	Inspection of faulty meters-rural	15 d	50/d	
22	Replace faulty meters - urban/rural	15d after inspection	50/d	
23	Replace burnt meters - licensee cause	7d	50/d	
24	Replace burnt meters - consumer cause	7d	50/d	After due payment
25	Bill complaint resolution - no additional info needed	24 wh	25/d	
26	Bill complaint resolution - additional info needed	7 wd	25/d	

S. No	Performance Indicator	Target Time	Compensation Rs./default	Overall Benchmark %
<b>IV</b>	<b>New connection/modification</b>			
27	Release of supply - no network change	30 d	50/d	After due payment
28	Release of supply- Agriculture	30d	50/d	If within target
29	Release of supply - network change, LT	30 d	50/d	After due payment
30	Release of supply - network change, HT	60 d	250/d	After due payment
31	Release of supply - network change, HT 33 kV	90 d	250/d	After due payment
32	Release of supply - network change, EHT	180 d	250/d	After due payment
33	Release of supply - network change, new substation needed	As specified by RC	500/d	After due payment
34	Title Transfer	7 d	50/d	After due payment
35	Category change	7 d	50/d	After due payment
36	LT single phase-three phase conversion & vice versa	30 d	50/d	After due payment
37	LT to HT and vice versa	60 d	100/d	After due payment
38	Re-connection -urban	4 wh	50	After due payment
39	Re-connection -rural	12 wh	50	After due payment

**Notes:**

1. h= hour; d= day; wh= working hour; wd = working day
2. Frequency variations = -2 to +1%; Voltage unbalance= 3% maximum at source; Billing mistakes <0.1% of bills issued; Faulty meters < 3% of meters in service
3. Voltage limits: LT = +6 to -6%; HT = +6 to -9%; EHT = +10 to -12.5%
4. Reliability index calculation: 33 & 11 kV non-agricultural feeders, 5 minute sustained interruption, weightage given to connected load, calculated monthly for whole DISCOM (see Annexure 2)
5. Compensation: Typically Rs/default. Else it is specified as Rs/h or Rs/d; If more than one consumer is effected, compensation is half the amount ;is effective after 3 months of notification (June 22.2004),urban areas, 1 year in rural; to be paid by the utility as adjustment of bills within 90 days from the date of violation
6. Rural = Areas covered by Gram Panchayats, including major and minor Panchayats

Table A3.5: COMPARISON OF GRF REGULATIONS - PAGE 1

S. No	State	Date of Regulation	Date of Formation	Number of GRFs	Strength	Qualification of GRF members	Maximum time for disposal-days	Remarks
1	Andhra Pradesh	Feb-04	Feb-04	1/Utility	3 + 1 coopted	1.Chair: Retired/serving the utility, degree in Electrical, 20 yrs in Distribution, SE; 2. Retired/ serving the utility, 10 yrs in Accounts, 5 in Revenue, Sr.Accounts Officer; 3.Retired/serving the utility, 5 yrs in Legal,Asst Secretary;4.Representative of a registered consumer organisation (co-opted)	45	Combined Regulation for GRF & Ombudsman. More GRFs if the 45 day target cannot be met. 4 GRFs formed.
2	Delhi	Mar-04	Jun-04	1/Utility	3	1.Chair: Degree in Electrical,SE; 2. Degree in law, 10 yrs in Legal ;3.Representative of a registered consumer organisation, 5 years in consumer matters; Utility to advertise for posts, give 3 names for posts 1 & 2 to RC and get approval. 2 years after retirement from utilities	60	Combined Regulation for GRF & Ombudsman
3	Gujarat	Aug-04	Jan-05	As many as Utility decides	Odd	1. 1/3rd engineers with 10 years in electricity industry; 2. 1/3rd law graduates with 10 years; 3. 1/3rd from consumer associations appointed by utility. Utility to decide Chair person. If suitable person not found, appoint with RC approval.	45	Separate Regulation for GRF & Ombudsman. SEC & AEC formed one GRF each.
4	Haryana	Aug-04	ND	1/Utility or more	3	1. Degree in Electrical/Mechanical,20 years in transmission,distribution,trading, SE; 2. Degree in law, 10 yrs in Legal ;3.Representative of a registered consumer organisation/NGO, Graduate; Age for all between 40 & 62.	90	Combined Regulation for GRF & Ombudsman. Forms for filing complaints and reporting given
5	Karnataka	May-04	F	1/utility	3	1.Chair: Experience in Electrical,finance, law, administration 2. Employee of the utility, SE; 3. Representative of a registered consumer organisation, 5 years in consumer grievances; All should have working knowledge of Kannada	60	Combined Regulation for GRF & Ombudsman. Forms for filing complaints given.

Table A3.5: COMPARISON OF GRF REGULATIONS –PAGE 2

S. No	State	Date of Regulation	Date of Formation	Number of GRFs	Strength	Qualification of GRF members	Maximum time for disposal-days	Remarks
6	Maharashtra	Dec-03	Jul-04	1/zone	3	1. Senior judicial officer or a civil servant not below the rank of a Collector; or Principal of a reputed Engineering college or Professor of the Electrical Engineering of a reputed institute or a senior electrical engineer of the Government (all retired); 2. Executive Engineer rank; 3. Representative of a registered voluntary consumer protection organization of the area, working preferably for 5 years on consumer grievances	60	Combined Regulation for GRF & Ombudsman. Forms for filing complaints given. 1-member GRF if consumers < 1,00,000. 15 GRFs formed – 12 for MSEB, 1 each for TPC, REL & BEST
7	Orissa	Apr-04	Aug-04	1/utility	3	1. President: Serving/retired from the utility, 20 years in distribution, electrical engineer, SE; 2. Serving/retired, 5 years in finance/accountancy/law in power sector, officer; 3. Representative from SAC/District Committee/Recognised consumer organisation (co-opted member)	45	Combined Regulation for GRF & Ombudsman. More GRFs if 45 day target cannot be met. 10 GRFs formed.
8	Rajasthan	Nov-03	ND & 1/utility	1/district	NS	NS	45	Separate Regulation for GRF & Ombudsman. Both are very brief.
9	Tamil Nadu	Jan-04	F	1/utility or more (37 formed)	3	1. Chair: Full time officer of utility, SE; 2. 15-20 years in finance/law, nominated by district collector; 3. From NGO/Consumer organisation, nominated by district collector	60	Combined Regulation for GRF & Ombudsman. Forms for filing complaints given. Number of GRFs to be such that none need travel > 100 kms.
10	Uttar Pradesh	Dec-03	F	1/circle	2	1. Presiding officer: SE in charge of circle or his nominee, at least EE; 2. Retired district judge/ additional district judge/lawyer with 20 years experience - nominated by GM of utility.	60	Combined Regulation for GRF & Ombudsman. More benches of GRFs if 60-day target cannot be met
11	West Bengal	Oct-03	F	3 Tier	1	3 Tiers - District: AE; Regional: DE, Corporate: CE	49	CESC had 3-tier system before E-Act. RC can change grievance officer

NF: Not Formed; F: Formed; ND: No data; NS: Not Specified; Ad: Advertisement ; Utility = Distribution Utility/Licensee

**Table A3.6: COMPARISON OF OMBUDSMAN REGULATIONS**

S. No	State	Date of Regulation	Date of Formation	Number of Ombudsman	Qualification	Maximum time for disposal-days
1	Andhra Pradesh	Feb-04	NF	1/Utility or 1/>2 utility	Legal,engineering,education,industry,civil/ administrative service,consumer affairs or eminence	90
2	Delhi	Mar-04	Jun-04	1 or more	Legal,management,engineering,finance, commerce, public administration,NGO. Secretary to the Govt of Delhi or equivalent. 2 years after retirement	90 Money to be deposited with licensee
3	Gujarat	Aug-04	ND	1/State or 1/few utilities or 1/utility. Can be odd numbers also. In that case, one will be the Chairperson.	Retired District Judge or qualified to be one; or 20 or more years in law, management or administration; or retired Chief Electrical Inspector / Chief Executive Officer / Managing Director / Chairman of an electricity sector utility or having 20 years of experience in the electricity industry.	Hearing within 45 days
4	Haryana	Aug-04		1/state	Electrical/Mechanical engineer, 25 years in transmissison,distribution,trading, CE. Age between 50 & 62.	90 Appeal on award to RC
5	Karnataka	May-04	Ad (Apr-05)	1/state	Knowledge in electrical engineering in power sector, finance, law, and administration, working knowledge of Kannada	60
6	Maharashtra	Dec-03	Dec-04	1/state	High Court judge or a Secretary to the Government, or Chief Executive Officer of an utility (all retired).	60
7	Orissa	Apr-04	ND	1/utility or 1/more than 1 utility	Legal,engineering,economics,finance,industry,civil service,consumer affairs or eminence	60 Selection committee = RC members
8	Rajasthan	Nov-03	ND	1/state	NS	90
9	Tamil Nadu	Jan-04	ND	1/state or more	Ability,integrity, experience in sector, high reputation.	90
10	Uttar Pradesh	Dec-03	NF	1/Utility	NS	NS UPERC planning to amend regulation
11	West Bengal	Oct-03	Jun-04	1/utility or 1/more than 1 utility	NS	20-30

NF: Not Formed; F: Formed; ND: No data; NS: Not Specified; Ad: Advertisement ; Utility = Distribution Utility/Licensee

**Table A3.7: COMPARISON OF SOP REGULATIONS – PAGE 1**

State	1. Fuse Off				2. DT Failure				3. Resolve Voltage problem- no n/w change			4. Resolve Voltage problem- with n/w change		
	Urban hrs	Rural hrs	Compensation Rs	Benchmark %	Urban hrs	Rural hrs	Compensation Rs	Benchmark %	Days	Compensation Rs	Benchmark %, (Note no)	Days	Compensation Rs	Benchmark %
1 Andhra Pradesh	4wh	12wh	50/def	99	24	48	100	95	10	50/d	NA(2)	120	100/d	NA
2 Delhi	3	8	NA	NA	48	48	NA	NA	3	NA	NA	180	NA	NA
3 Gujarat	4	24	25/6h	NA	24	72	25/6h	NA	NA	50/d	NA(2)	60	50/d	NA
4 Haryana	4	8	100/d	99	24	48	100/d	95	4h	100/def	95(2)	60	100/d	90
5 Karnataka	6	24	50/def	99	24	72	50/def	95	7	50/def	95(2)	120	50/def	90
6 Maharashtra	4	24	50/h	NA	24	48	50/h	NA	NA	100/w	NA(2)	NA	100/w	NA
7 Orissa	6	24	100/def	90	24	48	200/def	95	15	200/d	NA(2)	15	500/d	NA
8 Rajasthan	4	24	NA	NA	48	72	NA	NA	10	NA	NA(2)	180	NA	NA
9 Tamil Nadu	3	9	50/6h	75	24	48	50/6h	95	2	250/def	90	180	250/def	95
10 Uttar Pradesh	4	8	50/def	NA	24	72	50/def	NA	1	50/def	NA(2)	180	150/def	NA
11 West Bengal	4	12	25/h	NA	72	216	25/h	NA	15	25/d	NA	180	25/d	
Ofgem	3	NA	20/def	99.5	18	NA	50/def	99.5	NA	NA	NA	180	20/def	100

- h = hour; d = day; wh/wd = working hour/day; w= week; bc = billing cycle; def= default; NA = Not Available
- Voltage Limits:LT: +6,-6%; HT:+6,-9%;EHT: +10,-12.5%. Gujarat,Rajasthan has 2% as neutral voltage limit.
- AP: Compensation is less (about half) if more than one consumer is affected
- Delhi based on Draft SoP Regulations 2005; rural = suburban
- Gujarat regulation has: details of filing complaints, monthly grievance meetings at subdivision & circle level; mentions that compensation is automatic after GRF/Ombudsman decision, has details on quarterly/annual reports to be submitted by utilities to RC, asks each utility to form a SoP review committee
- Haryana: In most cases, compensation is automatic; Regulation has format for monthly reporting; DT failures urban <5%, rural <10%
- Karnataka: DT failures urban <5%, rural <12%
- Maharashtra: Benchmark figures not given; Voltage compensation is only for Mumbai - rest to be notified later; Regulation asks for reports to RC and GRF as well as putting the information on website
- Orissa: In most cases, compensation is automatic;
- Rajasthan: Regulation has complaint record procedure; monthly grievance meeting at AE and SE levels; RC is to set overall standards and decide on compensation
- Tamil Nadu: regulation has complaint registering procedure, utility reporting format
- UP: SoP is a part of the bulky Supply Code regulation; Has detailed complaint procedures; few compensation are automatic, which are to be implemented later
- West Bengal: Based on SoP draft Jun-04; Has some targets& compensation varying over years (eg.urban FO: 4,3,2 hrs; compensation:25,125,500); longer time frame for rural areas during monsoon (Jun-Sep); compensation automatic for new connections; has reporting formats and details of complaint management.
- Ofgem: Guaranteed and Overall Standards of Performance 2003;FO- 3h on weekdays&working hrs, else 4 hrs; all compensation in GBP;DT Failure column gives Fault details

**Table A3.7: COMPARISON OF SOP REGULATIONS – PAGE 2**

	State	5. Burnt meter replacement - problem attributed to licensee			6. Burnt meter replacement - problem attributed to consumer			7. Bill Complaints - No additional info needed			8. Bill Complaints - additional info needed		
		Days	Compensation Rs	Benchmark %	Days	Compensation Rs	Benchmark %	Days	Compensation Rs	Benchmark %	Days	Compensation Rs	Benchmark %
1	Andhra Pradesh	7	50/d	NA	7	50/d	NA	1	25/d	NA	7	50/d	NA
2	Delhi	3	NA	NA	3	NA	NA	15	NA	NA	30	NA	NA
3	Gujarat	7	25/d	NA	7	25/d	NA	1	50/def	NA	10	50/def	NA
4	Haryana	1	200/d	95	7	200/d	95	1	100/d	99	7	100/d	99
5	Karnataka	7	50/def	90	1	50/def	95	1	50/d	99	7	50/d	99
6	Maharashtra	1	100/w	NA	1	100/w	NA	NA	NA	NA	NA	NA	NA
7	Orissa	30	200/def	NA	15	200/def	NA	30	50/d	NA	NA	NA	NA
8	Rajasthan	NA	NA	NA	60	NA	NA	1	NA	NA	7	NA	NA
9	Tamil Nadu	30	100/d	95	30	100/d	95	bc	150/def	95	bc	150/def	95
10	Uttar Pradesh	3	50/def	NA	3	50/def	NA	7	50/def	NA	7	50/def	NA
11	West Bengal	13	25/d	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Ofgem	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

1. h = hour; d = day; wh/wd = working hour/day; w= week; bc = billing cycle; def= default; NA = Not Available
2. AP- Faulty meters: to be < 3%; Billing mistakes to be < 0.1%
3. Haryana- Faulty meters to be < 1%; Billing mistakes to be <0.1%
4. Karnataka- Faulty meters: to be < 2.5%;Billing to be 100%; Collection efficiency to be 95%
5. Maharashtra: Burnt meter replacement in rural areas in 2 days
6. Orissa: Faulty meters: to be < 5%;Billing mistakes to be< 0.1%
7. Delhi,UP: If meter burn is due to licensee fault, license will pay for the meter. If it is due to consumer's fault he/she pays for it, amount depending on how old the meter is
8. WB: Burnt meter - urban=13d, rural=16d; reduces over the years, shorter duration if supply is effected – eg. Urban = 46 hours

**Table A3.7: COMPARISON OF SOP REGULATIONS – PAGE 3**

State	9. LT New Connection - no n/w change			10. LT Connection - title change			11. Connection - Category Change			12. Effective Date	
	Days	Compen- sation Rs	Bench- mark %	Days	Compen- sation Rs	Bench- mark %	Days	Compen- sation Rs	Bench- mark %	Standards	Compensation
1 Andhra Pradesh	30	50/d	NA	7	50/d	NA	7	50/d	NA	Jun-04	Aug-04/Jun-05
2 Delhi	29	(2)	NA	2 bc	(2)	NA	29	(2)	NA	Draft	Draft
3 Gujarat	60	50/d	NA	7	NA	NA	NA	NA	NA	Jan-05	Jun-05
4 Haryana	30	200/d	95	7	100/d	99	7	100/d	99	Jul-04	Aug-05/Aug-06
5 Karnataka	30	200/d	95	7	50/d	99	30	50/d	99	Jun-04	NA
6 Maharashtra	30	100/w	NA	2 bc	100/w	NA	(1)	100/w	NA	Jan-05	Jan-05
7 Orissa	30	100/d	NA	15	100/d	NA	30	100/d	NA	May-04	After RC order
8 Rajasthan	30	NA	NA	NA	NA	NA	NA	NA	NA	Mar-03	NA
9 Tamil Nadu	30	100/d	95	7	100/d	95	7	100/d	95	Sep-04	Sep-05
10 Uttar Pradesh	7	(3)	NA	7	100/def	NA	NA	NA	NA	Feb-05	Automatic later
11 West Bengal	30	25/d	NA	NA	NA	NA	20	25/d	NA	Draft	
Ofgem	30wd	NA	100	NA	NA	NA	NA	NA	NA	Apr-02	Apr-02

Notes:

1. h = hour; d = day; wh/wd = working hour/day; w= week; bc = billing cycle; def= default; NA = Not Available
2. Delhi: Compensation for delay in new connection= 10/1000 of the deposit/day, subject to max of 1000/d; for title transfer = 1000/billing cycle
3. UP: Compensation for delay in new connection= 5/1000 of the deposit/day, subject to max of 1000/d
4. WB: Compensation is Rs. 25/time slab.
5. Effective date for compensation: Many utilities are reported to have sought for extension of this date.

**Table A3.8: GUARANTEED STANDARDS OF PERFORMANCE - OFGEM (2003)**

S. No	Reporting Code	Service	Target Performance Level	Penalty Payment- Pounds
1	GS1	Respond to failure of distribution fuse	Within 3 hours on weekdays(at least) 7 am to 7 pm, and within 4 hours at weekends between (at least 9 am to 5 pm)	20
2	GS2 *	Restoration of supply following a fault	Supplies must be restored within 18 hours, otherwise payment must be made	50 domestic customers, 100 non-domestic, plus 25 for further 12 hours
3	GS2A *	Multiple interruptions	Four or more separate interruptions each lasting 3 or more hours in any single year (1 April - 31 March)	50
4	GS3	Estimating charges for connection	5 working days for simple jobs and 15 for most others	40
5	GS4 *	Notice of planned interruption to supply	Customers must be given at least 2 days notice	20 domestic customers, 40 non-domestic
6	GS5	Investigate voltage complaints	Visit within 7 working days or substantive reply within 5	20
7	GS8	Making and keeping appointments	Companies must offer and keep a morning or afternoon appointment, or a timed appointment if requested by the customer	20
8	GS9	Notifying customers of payments owed under the standards	Payment to be made within 10 working days	20

\* :Customers need to claim under these standards, for the remaining standards payments are automatic

**Table A3.9: OVERALL STANDARDS OF PERFORMANCE – OFGEM (2003)**

S. No	Reporting Code	Service	Benchmark Target level -%
1	OS1	Restoration of supply: Minimum percentage of supplies to be reconnected following faults within 18 hours	99.5
2	OS2	Voltage complaints: Minimum percentage of voltage complaints to be corrected within 6 months	100
3	OS3a	New connections: Minimum percentage of domestic consumers connected within 30 working days	100
4	OS3b	New connections: Minimum percentage of business premises connected within 40 working days	100
5	OS4	Correspondence: Minimum percentage of customers letters to be responded within 10 working days	100
6	OS5	Multiple interruptions (from 1 April 2002): Minimum percentage of customers experiencing no more than five interruptions lasting 3 minutes or more	96-99 *

\*: Individual Company targets vary between 96-99%

**Table A3.10: CONSOLIDATION OF PERFORMANCE INDICATORS**

S.No		Performance Index	Remarks
	<b>I Restoration of Power</b>		
1		Fuse-off - urban	
2		Fuse-off - rural	
3		Overhead line failure - urban	
4		Overhead line failure - rural	
5		Underground cable failure-urban	
6		Underground cable failure-rural	
7		DT failure-urban	Haryana, Karnataka give 5-10 % range
8		DT failure-rural	
9		Street lights - faults	
10		Street lights - defective	
11		Scheduled outage notification	
12		Scheduled outage duration	
13		Scheduled outage time limit	
14		Reliability Indices	SAIDI,SAIFI,MAIFI,CAIFI,CAIDI
	<b>II Quality of Supply</b>		
15		Resolve voltage fluctuation - no network change	Voltage limits as per IER
16		Resolve voltage fluctuation - with network change	
17		Resolve voltage fluctuation - with s/s erection	
18		Voltage unbalance	
19		Neutral Voltage limit	Gujarat, Rajasthan give 2% of supply voltage
20		Frequency variation	
21		Harmonic Content	Rajasthan, Maharashtra (IEEE 519-1992 std)
	<b>III. Metering &amp; Billing</b>		
22		Inspection of faulty meters-urban	Most states give faulty meters to be less than 1-5%
23		Inspection of faulty meters-rural	
24		Replace faulty meters - urban/rural	
25		Replace burnt meters - licensee cause	
26		Replace burnt meters - consumer cause	
27		Meter Reading cycle	Maharashtra

S.No		Performance Index	Remarks
28		Meter Testing	Rajasthan
29		Bill complaint resolution - no additional info needed	
30		Bill complaint resolution - additional info needed	
31		Re-connection -urban	
32		Re-connection -rural	
33		Collection efficiency	Karnataka gives 95% for metered
	<b>IV. New Connections/Modification</b>		
34		Release of supply - no network change	Most states as per E-Act provision
35		Release of supply - network change, LT	
36		Release of supply - network change, HT	
37		Release of supply - network change, HT 33 kV	
38		Release of supply - network change, EHT	
39		Release of supply - network change, new s/s needed	
40		Title Transfer	
41		Category change	
42		LT single phase-three phase conversion & vice versa	
43		LT to HT and vice versa	
44		Refund of Deposit/Closure	
45		Temporary Connection- <10kVA	
46		Temporary Connection- >10kVA	Gujarat
47		Shifting of service (meter,line,transformer)	Gujarat
	<b>V. Other</b>		
48		Accident Compensation	Karnataka, Haryana
49		Issue of certificates	Karnataka, Haryana
50		Respond to complaints	TN,Gujarat, Rajasthan
51		Keep appointments	TN
52		Identity card for staff	Maharashtra
53		Closure of account	Maharashtra
54		Complaint of inadequate clearances	Rajasthan

**Table A3.11: BEST PRACTICE FEATURES IN GRF AND SOP REGULATIONS**

<b>Grievance Redressal Forum</b>											
<b>S.No</b>	<b>Feature</b>	<b>AP</b>	<b>Delhi</b>	<b>Gujarat</b>	<b>Haryana</b>	<b>Karnataka</b>	<b>Maharashtra</b>	<b>Orissa</b>	<b>Rajasthan</b>	<b>TN</b>	<b>UP</b>
1	Consumer Rep in GRF with voting rights	N	Y	Y	Y	Y	Y	N	NS	Y	N
2	Non-utility member in GRF with voting rights	N	Y	Y	Y	Y	Y	N	NS	Y	Y
3	Fixed Term for members	Y	Y	Y	Y	N	Y	Y	NS	Y	Y
4	No re-appointment	Y	N	Y	Y	Y	Y	N	NS	Y	Y
5	Time limit for grievance handling	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	<b>Standards of Performance</b>										
1	Performance Benchmark	Y	N	N	Y	Y	N	Y	N	Y	N
2	Automatic Compensation	N	N	N	Y	N	N	Y	N	N	N
3	SoP Reporting formats in regulation	N	N	Y	Y	N	N	N	Y	Y	Y

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The group started working in the energy sector, but soon restricted its work to electricity sector policies, covering techno-economic, financial, legal, procedural, planning, political, and institutional issues.

In the last fifteen years, the group has worked on a wide range of issues and themes such as integrated resource planning, agricultural subsidy, policies of the international financial institutions, power purchase agreements of independent power producers, electricity sector restructuring and reforms, and regulatory commissions.

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