Normalization and Standardization of Distribution Sections in the Electricity Department of the City of Tshwane Metropolitan Municipality – A CTMM experience

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Abstract:

This is a synopsis of a program undertaken by the Electricity Department of the City of Tshwane Metropolitan Municipality[1] in an effort to align the administration with the political vision. It emanated from the Member of Mayoral Committee responsible for Energy and Electricity.

Upon taking office, the MMC embarked on a drive to restructure the Department by having a ten-point plan which was dubbed a Business Plan and was later adopted by Council, whereby action plans were put into motion and the vision is being realized.

1. Introduction

The CTMM consists of amalgamated thirteen municipalities around Pretoria, where in 2001; departments were consolidated into Strategic Units, and the Electricity was a sub-unit or Division of Service Delivery Department. All this was done as a result of the new dispensation where centralization was primitive.

Upon taking office in 2003, MMC LL Nawa in his ten-point strategic plan, wished among others, to elevate the division to a department as well as normalize and standardize the sections within the department.

In this paper we will present the **Normalization and Standardization of Distribution Sections – an experience of the CTMM**. We will indicate the processes, constraints, expectations, results, researches, statistics and all related matters leading to a Normalized System based on democratic vision/directives as "*dreamed*" by the political sphere in the local government.

We shall further give suggestions to those municipalities who are going to go the same route some tips on the do's and don'ts or pros and cons. This will in particular, assist with the formation of the REDs and in particular- the ringfencing exercise as initiated by the EDI Holdings (PTY) LTD, in particular the Operational Ringfencing.

We will, however accept constructive criticism and maybe re-look into the program and be in a position to rectify those mistakes that were unintentionally committed by the officials in an endeavor to better the lives of the Citizen of the City of Tshwane during the restructuring of the industry.

[1] Pretoria City Council, Northern Pretoria Sub-Structure, Mabopane Transitional Council, Ga-Rankuwa Transitional Council, Winterveldt Transitional Council, Pienaarsrivier Local Authority, Eastern and Western Gauteng Services, Centurion Town Council, Crocodile river Local Authority, Temba Transitional Council and other municipalities as amalgamated

Hereunder is a map showing the location of depots and boundaries of electrical power distribution in the geographical areas of CTMM.

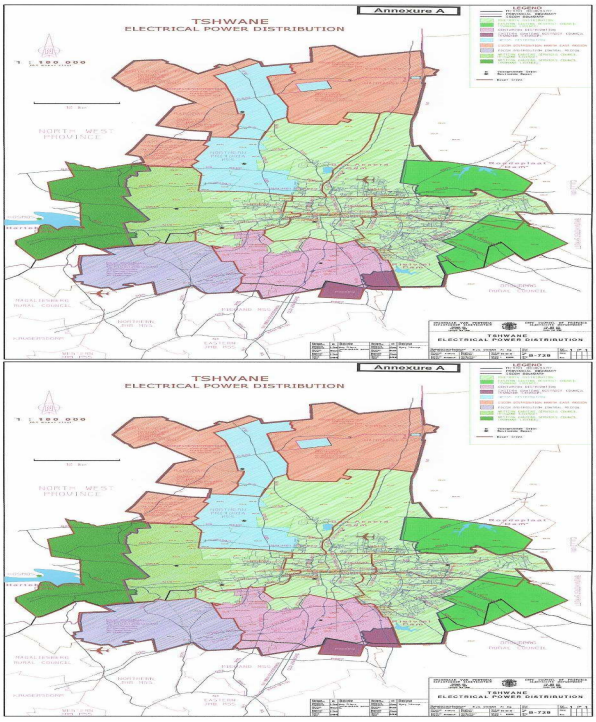

Fig 1: Electrical Power Distribution Map of the CTMM

2. Political Vision

For the administration to function in harmony in a healthy political environment, there need to be synchronism between the two. The MMC: Energy and Electricity to operate in the Electricity Department and be able to defend the position taken by the administration regime in issues like electrification from an engineering perspective, alignment of the City Development Strategy, Integrated Development Plan to his principals, he needed to understand the synchronism if not the existing, he needed to create it.

The MMC: Energy and Electricity created a roadmap to navigate the synchronism within the department. Hereunder is the abridged ten-point plan which was used as a tool and adopted by Council:

1. Normalization and Standardization of Services
2. Occupational Health Safety
3. Creation of a final organigram that is acceptable to all staff members
4. Implementation of Employment Equity
5. Implementation of Black Economic Empowerment
6. Strive for the handover of ESKOM Infrastructure and Service Provision in the North to City of Tshwane
7. Rolling of prepaid meters system throughout Tshwane not only to the indigents but to all citizens/customers of the City
8. Synchronizing the installation and revitalizing of street lights and high mast lights
9. Financial control
10. Management of distribution losses.

The Normalization and Standardization was further subdivided into sections viz. **Normalization and standardization of Distribution Sections.** This is in particular a topic we will deliberate on throughout the paper.

3. Normalization and Standardization of Distribution Sections

The approach adopted was to determine the Status Quo of the distribution section first and do analysis of the findings. The Managing Engineers were helpful in the gathering of relevant information and data in their respective areas. Secondly, the analyses that were done took into consideration the constraints and challenges associated with a large organization. Finally, we then informed Council on our strategic action plans over short- medium- and long-term in a form of recommendations.

3.1 Status Quo Report

Outlined below are the findings regarding the status quo functions, resources, and *modus operandi*, infrastructure, Maximum Electricity Demand (MVA's) and consumers' profile of the existing depots. On average the depots have 50 000 connections, as proposed by Steward Scott Consulting Firm in a study conducted in 1999. The report further suggested that a functional depot should have between 100 and 300 operational and support personnel. According to the records of stores and inventory, the allocations vary from depot to depot, but with an equal estimated average. The approved total operational budget per depot for the study financial year was found to be as indicated below:

Table 1: Financial allocations

DEPOT	**TOTAL BUDGET (% of Total Distribution Allocation)**
Depot A	18.63%
Depot B	20.06%
Depot C	18.76%
Depot D	6.92%
Depot E	18.29%
Depot F	8.67%
Depot G	4.24%
Depot H	4.44%

As shown in the above table, disparities were found using this study. And this emerged to be a trend as will be indicated, highlighting what the political incumbent suspected.

Table 2: Human resources

DEPOT	**PERCENTAGE OF EMPLOYEES**			
	FILLED PERMANENTLY	CONTRACTS	VACANT	TOTAL AS %AGE of DS
Depot A	20.29%	0.00%	12.06%	17.95%
Depot B	18.64%	0.00%	9.80%	16.12%
Depot C	19.46%	0.00%	17.34%	18.90%
Depot D	12.46%	7.27%	8.29%	10.99%
Depot E	9.58%	0.00%	13.57%	10.77%
Depot F	8.96%	5.45%	9.55%	9.16%
Depot G	8.03%	49.09%	10.05%	8.64%
Depot H	2.57%	38.18%	19.35%	7.47%

A separate column of electricians was added to highlight the composition and need of core business personnel as indicated on the approved structure. This is indicated in Table 2(a) below. This is the departure point to constitute all supporting personnel for a model for an electrical depot in the Electricity Department.

Table 2(a) Electricians in distribution sections

DEPOT	Electricians as percentage of total distribution sections		
	Filled	**Vacant**	**Total**
Depot A	17.21%	6.38%	12.50%
Depot B	21.43%	8.51%	14.81%
Depot C	26.79%	11.70%	18.98%
Depot D	11.61%	9.57%	10.19%
Depot E	13.39%	11.70%	12.04%
Depot F	12.50%	12.77%	12.04%
Depot G	4.46%	20.21%	11.11%
Depot H	0.00%	19.15%	8.33%

Table 3: Vehicle profile per depot

DEPOT	PERCENTAGES AND AGES OF VEHICLES			
	HEAVY	AVERAGE AGE	LIGHT	AVERAGE AGE
Depot A	25.00%	17	14.56%	12
Depot B	26.10%	17	13.29%	8
Depot C	22.79%	15	20.25%	12
Depot D	8.82%	8	12.03%	10
Depot E	6.99%	10	15.19%	8
Depot F	8.82%	8	12.03%	10
Depot G	1.47%	10	12.66%	10

Table 4: Depot Offices

DEPOT	GOOD	AVERAGE
Depot B		X
Depot C	X	
Depot D*		X
Depot D*		X
Depot E	X	
Depot F	X	
Depot G		X

* One management Depot with two area operational offices. It can also be noticed that Depot A did not have Operational Offices, but operated from Depot B's premises.

Tables 3 and 4 above were added in for further analysis of the Status Quo where vehicles and the depot office were visited by the working group in the compilation of the report. These figures also indicated the disparities in the different functional units.

Table 5: Consumer profile

DEPOT	CONSUMERS			
	Estimated % Connections	% Distribution		
		Industrial	Household	Commercial
Depot A	13.37%	0	85	15
Depot B	17.82%	25	60	15
Depot C	16.58%	15	50	35
Depot D	11.14%	5	80	15
Depot E	10.89%	15	70	15
Depot F	11.14%	35	50	15
Depot G	13.61%	0	90	10
Depot H	5.45%	5	85	10

The approximate maximum demand of each depot as compared with the whole demand of the Electricity Department was tabulated in Table 6 below during the study year:

Table 6: Estimated MVA per depot

DEPOT	% MVA of CTMM
Depot A	18%
Depot B	14,1%
Depot C	25%
Depot D	12%
Depot E	16%
Depot F	7,8%
Depot G	3,6%
Depot H	3,5%

The data as indicated in Table 6 is an abstract of estimated load readings that are compiled yearly at peak times during the winter months. It reflects electricity consumption at 11kV level per depot.

4. CHALLENGES

The Electricity Department as part of the City of Tshwane Metropolitan Municipality, just like any organization is faced with the following challenges in the distribution of electricity:

- To adhere to the strategic goals of the City to develop the northern area of Tshwane and to sustain the services in the South, as highlighted in the CDS[2].
- To allocate the available resources to comply with the City strategy including the building of new operational depots to minimize the operational expenses of the Department and to maximize the levels of costumer service. The challenge is also to divide the operational- and human resources equally and to ensure that people of all races will be seen working throughout the area.
- To create a working environment where the staff will prosper and where staff will have the opportunity to work in an environment conducive to that of a culture where staff can perform.

[2] City Development Strategy: Goal One – Develop the North, Maintain the South

- To standardize all work procedures and standards throughout the city in an effort to work according to best practices and to equalize the levels of costumer satisfaction of our client base.

- To comply with all regulatory standards as a minimum and to create a safe working environment for our staff and the public.

4.1 CURRENT CONSTRAINTS (THEN)

The Electricity Department is faced with various constraints which also formed part of this study in an effort to deliver a sustainable service

- Financial constrains;
- The availability of resources (material and logistical equipment);
- Very high vacancy levels of the operational-and support staff,
- The diversity of the workforce;
- The huge geographical area and historical development of towns according to race segregation;
- The current moral of the staff in an ever changing environment;
- The ever decreasing state of the network;
- The current demographical areas allocated to the existing depots;
- The current allocation of staff creating a situation where most of the areas in the North are experiencing problems to conduct there work in accordance with the strategic goals of the City.

4.2 ESTABLISHMENT OF DEPOT “G(a)”

The establishment of an additional depot in the Northern area of supply in order to comply with the increasing demands in the area will have to be established as a matter of urgency. This can be done through the development of a separate depot functioning as a separate entity on its own or as a satellite depot to the “G” depot. This challenge was singled out as the most primitive amongst others.

5. NORMALISATION METHOD

Efforts and investigations have been done to come up with an acceptable formula to normalize the distribution function in the Electricity Department. A presentation on zero-based budgeting, maintenance scheduling, plant details and related issues was presented to the Managing Engineers and all depots apply the method to standardize as one of the first steps.

Another departure point was to identify core business personnel such as maintenance electricians and their worker teams. This method was agreed upon due to the fact that all support, equipment, plant details, number of consumer connections and related issues tie to the electricians in one way or another.

5.1 Normalization formula

To compare the depots, a normalization formula was developed. The rational behind the formula is:

- A list of typical equipment to be maintained by each depot was compiled.

- An estimate was made of time required to maintain each piece of equipment at least once every five years, or as required as mentioned in the Department’s Maintenance Management Plan.

- An audit was conducted at each depot to gather information regarding the quantities of equipment to be maintained. Thereby defining the extent and condition of the infrastructure, regardless of the asset register. The accuracy of the audit is estimated to be within 15% of the actual.

- The time required to maintain each piece of equipment was multiplied with and/or condition extent of the infrastructure to determine the total time required for the maintenance of the entire infrastructure.

- From the total time required to maintain the entire infrastructure the number of electricians required were determined at each depot.

- Electrician teams were considered as an average of five persons per team. Management was considered as an estimated 10% of the operations team.

It can be finalized that for a depot to function as per formula; key performance areas, functions of specialized, multi-skilled, management, streetlight maintenance, breakdown repairs, network and condition maintenance and small-scale construction has been considered, hence this method has been adopted. Table 9 below shows the percentages of artisan worker teams as per formula method.

Table 9: Estimated artisan teams

DEPOT	PERCENTAGE OF ARTISAN TEAMS
Depot A	12.90%
Depot B	11.69%
Depot C	16.13%
Depot D	11.69%
Depot E	11.29%
Depot F	12.90%
Depot G	11.69%
Depot H	11.69%

5.2 Support staff

As per the adopted method, support staff is proportional to worker teams. These findings and recommendations were compared with the Electricity Structure Working Group[3] proposals, and ties within international trends on organizational designs.

5.3 Special worker teams

The formula is based primarily on scheduled maintenance plans. However, small- to medium scale breakdown component is also accommodated.

Special worker teams like centralized streetlight maintenance, construction and cross-border (depot level) management teams do not reflect directly on the relevant Depots. For example, streetlight maintenance centralized at Depot “C”.

[3] A study group commissioned to realize point three on the ten-point plan as mentioned earlier.

5.4 Staff composition

With the normalization formula, the team managed to determine the present status and future allocation/composition of depot staff. Electricians were taken as the basis to determine all depots needs. This base model excludes ESKOM areas; however the Council approved Electricity Department Structure make provision for total depot personnel.

6. NORMALISATION ACTION PLAN

For the group to generate a feasible report to Council, strategic action plans were drawn up and lined as follows:

6.1 Short term measure (12 months)

6.1.1 Staff

- The reallocation of staff from other depots that are better off compared with those using the contractors, Depot "G" and the Northern depots in particular. The filling of critical vacancies and focusing specifically at the historically disadvantaged area like in Depot "G".

6.1.2 Infrastructure

- The establishment of the Electricity Depot "G" on a new site.
- The establishment of the Electricity Depot "A".
- The closing down of Depot H and transferring of resources to Depot G(a).
- The establishment of Depot "G(a)" depot as a satellite to Depot "G".

6.1.3 Vehicles

- The transfer of specialized vehicles to Depot "G" in particular.
- The purchasing of vehicle and equipment for Depot "G".

6.2 Medium term plans (2 years)

- Establish fully operational Depot "I".
- Determine the status of Depot "D(b)" facility.

6.3 Long term plan

Participation in the REDs process has superceded this plan.

7. BUDGETING

Upon budgeting for future financial periods, the requests for funds took into account the already uneven distribution of resources as highlighted under status quo.

8. CONCLUSION

Upon submission of the report to Council it was approved with the notion that day-to-day action plans will be enacted immediately to realize a Normalized and Standardized System. The mandate was also extended to do a study into the boundaries of distribution depots, taking into account the study report and its recommendations. This may be unique to the City of Tshwane, but the gathering of information and identification of constraints for analysis are very much generic to be employed by any organization.