ARGENTINE CRISIS – A MAINTENANCE CHALLENGE – PAPER 708

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The enterprises in charge of the distribution of energy in our country received the properties from the National Government in certain technical conditions such as: old fashioned equipment, poor maintenance, inadequate operation and generally with a deficient net exploration.

In a convertibility and economic trust environment, the equipment started to be replaced by imported products, which cost, service, trust and low need of maintenance plenty justify its incorporation to the network.

As a consequence of that, there was a strong fall in the market of equipments produced in Argentina up to the point that some business men stop manufacturing to start importing and others simply disappeared from the market.

Since the Argentinian crisis (an exit from convertibility from $ Arg. 1= US$1) a “bottle neck” was produced in the technological field. On the one hand, the imported equipments became very expensive and their importers disappeared due to the poor sales and, on the other side, national industry had already stopped producing local equipments.

Before such situation that will logically project itself into the future, appears the need of a strategic change as well as a challenge: to make the maintenance of a field of mixed installment, formed by old and new technology, but both suffering from the same problem: the difficulty to get spare parts because of the imports prices or the lack of them in the national industry.

The imposed focus change is: not to separate the installment into “old”/ “new” but into “able to maintain” or “unable to maintain”.

Our job shows the systematic method of analysis that applied in EMDERSA to the following main variables:

1. Plant inventory
2. Suppliers list
3. Importers list
4. Prices list
5. Availability classification
6. Short circuit and load flux reckoning

It allows us to determine the best location of an element within the net and the technical-economical maintenance possibility.

The most important results achieved with this were the following:
- To keep the quality standards achieved before the crisis
- To count on the equipment connected to the mains which maintenance is possible.
- To assure the elements operation
- To redefine the operation conditions and limitations of each element.
- To answer, satisfactorily and at a reasonable cost, to the technical and operative mains requirements.

The redistribution of the “no maintainable” equipments within the mains is not enough: This is the beginning, not the end of the task.

The permanent appearance and disappearance of suppliers and products, national as well as foreigners, at the economical changes pace, encouraged us to apply these techniques, in a continuous way, without disregarding any factors that take part in the analysis equations.

COMPANY DESCRIPTION

Our company, EMDERSA, is in charge of the distribution of electrical energy (operative) in the provinces of Salta (EDESA), San Luis (EDESAL) and La Rioja (EDELAR), the three of them supplying around 500,000 different customers such as different categories residential, commercials, agricultural, little, middle size and big manufacturers.
Salta: it has an area of 155,488 square Km, is bounded by 3 countries (Paraguay, Bolivia and Chile) and 6 Argentinean provinces (Jujuy, Santiago del Estero, Tucumán, Catamarca, Formosa y Chaco), in this province we have 230,000 customers.

La Rioja: It has an area of 89,680 square Km, it is bounded by Chile and 4 Argentinean provinces; Catamarca, Córdoba, San Luis y San Juan. In this operative we supply 90,000 customers.

San Luis: with an area of 89,680 Km², is situated in the centre of the country limiting with La Pampa, Córdoba, San Juan, La Rioja y Mendoza. We supply 120,000 customers.

Within the concession mains there are A. T. mains in 132 and 66 kV, (with a range of 1,200 Km), M. T. mains (33 and 13.2 kV) and a B. T. wide and varied mains supplied by around 9,000 transformation centers.

INTRODUCTION

In this work we have placed as an “example and summary mode”, a part of EMDERSA electrical system and above this we apply the “OPTIMIZATION” program.

Of all the equipments installed in our network, we have chosen the part that concerns our system of High Tension Transport of 132 and 66 kV formed by 63 High Tension switches of different ages, technology, maintenance history, present and installed in different “NODS” of the three operatives.

Over this equipment subgroup we applied the “OPTIMIZATION” program that we use today in all the High and Middle Tension mains of EMDERSA.

We have decided to show the committee this part due to the fact that the High Tension equipments are on one side, less and on the other side; they are not interchangeable like the ones of Middle and Low Tension. Consequently, there is an equipments subgroup to be studied like that within the system and allows us to see the benefits of the “OPTIMIZATION” program in a better way.

Coming back to our example, in this subgroup (High Tension Switches) we can clearly see Old and New Technology equipments living together.

The challenge is to place each equipment in the appropriate NOD of the net to fulfill its function and, at the moment of doing maintenance tasks; they have reasonable prices and are possible to do.

Considering the Plant Inventory we can conclude that there are different ages equipments (year 1958- the oldest and 1998- the newest), different technology (Small Quantity of Oil and Sulphur Hexafluoride) and placed in the mains different nods.

To the nods electrical characteristic (Nominal Intensity, Short circuit Intensity, Nominal Tension) it has been added another variable that is very important. For that reason it is given priority to the nod from another point of view that is Service Quality presented by the “Energy” variable which, for the privatized Distributors, represent an added cost rightly proportional In this way our Nods already present their technical characteristics and the variables allow us to give priority to them.

Besides, we have been permanently communicated with the well known suppliers and importers and, at the same time, well aware of the appearing and disappearing of new suppliers of spare part for our mains equipments.

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<th>Nº</th>
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<th>Instalation</th>
<th>field</th>
<th>In amp</th>
<th>Icc amp</th>
<th>Peso Nod</th>
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Now then, our optimization program takes each equipment and pass it through a first “FILTRE” that examines all the proposals made by the spare parts suppliers and importers, in this way, we can foresee, according to the market “ACTIVE” offers for the date we run the program, if our equipment is POSSIBLE or IMPOSSIBLE TO MAINTAIN.

This is our first analysis, then for the POSSIBLE TO MAINTAIN equipments we apply a low cost routine from a supplier as well as group of them considering their offer at the time of the analysis.

On the other side, the IMPOSSIBLE TO MAINTAIN equipments are weighted up according to its technical conditions “PRESENTATION and TECHNOLOGY” giving them a “TECHNOLOGICAL WEIGHT” and in accordance with the installment place requirements (voluntary openings / maneuvers and involuntary openings/ failures Combination), it is obtained a coefficient we define as “NOD’s WEIGHT”.

Right now the “OPTIMIZATION” PROGRAM starts working in the following way:
For each equipment, it firstly locate where the NODS, according to the technical characteristics can be installed, so that, several possibilities are eliminated.

Then, from the NODS that remain after the first selection, the equipment is assigned to those that, according to the maintenance weight, could be installed and among all the possibilities the one which will need less maintenance during the year is chosen.

For all the above said, it can bee seen that our program ended sketing a new network where the equipments (switches) are distributed in the system OPTIMIZING the preventive maintenance function for the existing market conditions.

CONCLUSIONS
Obviously all the above said does not mean that in our company we are moving High Tension equipments every month from one point of the net to the other because in this way, every achievement from the maintenance plan would be lost before transport operative costs.

Actually alter applying the “OPTIMIZATION” program we have performed several changes between Middle Tension equipments with positive results that have allowed us to:
- Guarantee the operation when it is necessary in a voluntary way or because a failure in the net.
- Redefine the mains operation giving higher numbers of maneuvers per nod so as to enlarge the equipments useful life between maintenance. Otherwise, we only make the maintenance with surplus spare parts stocks because they do not exist in the market.
- Install the easiest “to maintain” equipments in the most severe operation
- Nods assuring they have the technical characteristics compatible with the NOD.
Thanks to this simple model we are sailing the crisis our maintenance section is going through.

Yes               no        NO

¿It’s possible to find another place to the equipement?

Yes

To Drive the equipement
in the minimum technical
possible conditi

To Make
Maintenance
low Cost

To Make
Maintenance
low Cost

Economical Analysis

To make
Changes in the NET

To put equipment
in the NOD

To put equipment
in the NOD