

This newsletter is published from time to time each year. It considers different topics relevant to dedicated professional networks and projects, such as mobile radio networks for public safety authorities, mobile or fixed radio networks for oil & gas industry, or mobile radio networks for railways, metro, or other transportation business areas. Professional networks are typically based on TETRA, or other technologies, which meets requirements of professional use.

### **TETRA network performance and quality optimisation**

Network optimisation is an iterative process where the target is to improve the offered average quality of service by cost-effective means. The process continues the entire life cycle of the network. Optimisation starts after the network roll-out phase. For the optimization the network shall be regularly audited (tested, measured).

Very often there is pressure to fast expand the initial network, and add subscribers and applications on the network. The network may have been in operational use for several years, so that most of the network parameters, for example, still have their initial default values.

There can be specific problems and issues in the network. Examples of these are lack of capacity, interference, "cell dragging", call drops, low voice quality etc. Network optimisation can help to solve them permanently.

#### **Means of optimisation**

The target of the optimisation is to improve the average quality of the service, as perceived by the network users. The average quality of the service can be measured by Key Performance Indicators (KPI) of the network. Respectively, the target of the optimisation is to improve values of the KPIs. How much KPIs can be improved depends on their initial values and effect of the optimisation actions.

Typical KPIs of TETRA network are: Call Success Rate, Call Queuing Time, Call Drop Rate, Handover Success Rate, SDS Success Rate, Availability of Radio Interface etc. KPIs concern separately group and individual calls.

Means of the optimisation are typically coverage improvements, parameter and configuration changes. Typical changes are: new frequency plan/allocation, antenna tilting and redirection, site configurations, adding transceivers (TRXs), sites, or repeaters, optimizing parameters in Network Management System (NMS) database for handover and traffic distribution etc.

#### **Procedure and methods (as one-off project)**

1. Collection and summary of all data relevant for the network quality and performance e.g. network call statistics and fault statistics from the NMS.
2. Performance of field measurements (drive tests).
3. Analysis and processing of all collected information, including calculation of the KPIs.
4. Identification of optimization actions and follow-up of their implementation.
5. Repetition of selected field measurements and collection of new quality and performance statistics.
6. Analysis and processing of measurements results and statistics, and calculation of the KPIs.
7. Conclusions on the quality and performance of the network, including definition of additional actions.

### **Optimisation results**

- Key Performance Indicators (statistics), including quality of the radio coverage
- Network improvement actions
- Improved performance level and its verification

### **Benefits for network operators and users**

Network optimisation has proven to be an important way to essentially improve user satisfaction of the TETRA network. Specific network problems, such as problems around certain base stations, can be solved. Overall performance level of the network can be improved. If a continuous network quality and performance monitoring process is not in place yet, a one-off network audit and optimisation project serves as a tool to identify present network quality in a measurable way. This further helps to develop a continuous quality management process.

### **Pöyry Telecom**

Pöyry Telecom has performed TETRA network performance audits and optimisations in a number of countries and networks (e.g. Finland, The Netherlands, Oman, UAE and Qatar)

Pöyry Telecom is an independent consulting company, which provides telecommunication consulting and engineering services for the entire telecom sector, covering the whole value chain, technology spectrum and life cycle. Pöyry Telecom is part of Pöyry group, a global consulting and engineering firm focusing on the energy, forest industry and infrastructure & environment sectors.

Pöyry Telecom has over 15 years of international experience of professional network projects and all phases of the network lifecycle.

Please visit our homepage at <http://infra.poyry.com/telecom> for more information about Pöyry Telecom's services and solutions.

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