Chapter 8
Innovative Monitoring

ABSTRACT

Innovative solutions and technologies are highly dependent on the state of existence (the technical infrastructure available). The existence of a man is vocation for creating. Creation is an ability to act – moderation – decisive moment. Types of engineering creations (achievements) include: knowledge, technical innovation (new machines), and arrangement, or organisational improvement. A dynamic creation, development of new infrastructure and technologies favours the fulfilment of objectives defined in energy policies adopted by many countries for the next 10 years. A tool that supports objectives of the technical infrastructure creation and development is based on innovative active monitoring of technical (energy) systems, which, through observation and diagnosis of the state, provides the necessary knowledge about the analysed system and enables the achievement of satisfactory values of parameters describing the quality (of energy, energy services) through the control (of supply), regulation (of power level), and compensation (of disturbances).

8.1. ACTIVE MONITORING STRUCTURE

Operation and development of special technical systems (ST), after applying the active monitoring, innovative solutions and technologies are highly dependent on the state of technical infrastructure available. The word infrastructure is derived from two Latin words: *infra* (means: at the bottom, under, below) and *structura* (means: the layout and relationship of elements constituting a whole). The infrastructure is thus the basis for any agreements that support the social, manufacturing and economic activities and it facilitates the development of the production, though it does not participate directly in its implementation. Infrastructure of technologies and energy sources includes the action potentials, resources, sets of equipment, transmission and distribution networks; relationships between providers of essential and basic services for a specific spatial/economic unit (city, industrial plants, etc.), related to the supply of electricity, heat, gas, water, sewage and waste disposal, as well as transport and telecommunication services (*Act, 2011; Bieliński, 2004; Bieliński, & Flizikowski, 2007; Bieliński, & Flizikowski, 2008; Bieliński, 2011; Elmo, 2011; Flizikowski, 1998; Flizikowski, 2006; Flizikowski, 2008-2010; Flizikowski, & co-authors, 2009; Flizikowski, 2011a; IRiESD, 2010; Kacejko, 2004;*

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Kłos, 2011; Kowalak, 2010; Kurczewski, Lewicki & Kłos, 2011; Niederliński, 1987; IEC, 61724; Macko, & Co-authors, 2011; Ministry of Economy, 2007; Ministry of Economy, 2009a; Ministry of Economy, 2009b; Musiał, 2004; Paska, 2010; Popczyk, 2010; Semczuk, 2010; Tomporowski, 2011; URE, 2011; Węglarz, 2010).

In the global social realities, within the technical infrastructure, safety systems, energy supply and power quality systems have become of particular significance. However, in the field of production, the efforts focus primarily on the development of systems that support the improvement of energy, economic and environmental efficiency of the technological processes.

Apart from subordinate (needs satisfying) function of the technical infrastructure towards the society and economy, the infrastructure is characterized with high investment costs, high durability and close relationship with the surroundings.

Currently, the development of technical infrastructure is primarily aimed at meeting steadily growing energy demand, reducing the negative influence of transforming energy carriers into a technologically useful form on the environment and the at improvement of the quality of: the delivered goods (energy carrier, energy) and the service provided (transmission, distribution). A tool that supports objectives of the technical infrastructure development is based on active monitoring of technical (energy) systems, which, through observation and diagnosis of the state, provides the necessary knowledge about the analysed system and enables the achievement of satisfactory values of parameters describing the quality (of energy, energy services) through the control (of supply), regulation (of power level) and compensation (of disturbances).

Figure 1 shows a diagram of the relationship between the technical system (ST), the environment (OT) and the monitoring zone (SM) (boundary zone).

Figure 1. Schematic relationship between the technical system (ST), the environment (OT) and the monitoring zone (SM=SG) (boundary zone)