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Action IC0806
Intelligent Monitoring, Control, and Security of Critical Infrastructure Systems (IntelliCIS)

ICT

Participating countries: BE, BG, CH, CY, CZ, DE, DK, ES, FI, FR, GB, GR, HR, HU, IE, IL, IT LV, LT, NL, NO, PL, PT, RO, RS, SE, SI, TK, AU, LB, MD, US, ZA

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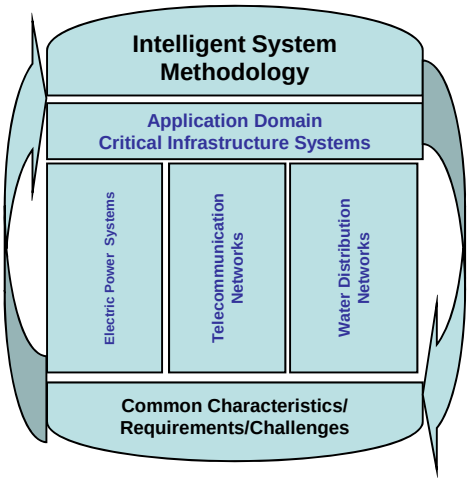

Objectives:

- Form a European-wide scientific and technology knowledge platform and instigate interdisciplinary interaction in the development of innovative intelligent monitoring, control and safety methodologies for critical infrastructure systems, such as electric power systems, telecommunication networks, and water systems
- Develop innovative intelligent management, monitoring and control models and algorithms for fault tolerant operation of Critical Infrastructure Systems (CIS)
- Develop behavioral and functional models for accurately characterizing the operation of CIS under steady state, dynamic, and post-fault conditions
- Develop interactive models between more than one CIS (e.g., modeling the interdependence between communication and electric power networks)
- Investigate Wireless Sensor Network based technologies as effective solutions for the problem of distributed, reliable and economic monitoring of CIS

Working Group 1

Focus on intelligent systems approaches for critical infrastructure systems (CIS). The aim is to make contributions to the theory of control of large-scale CIS. Specific objectives include the development of models that can capture the dynamical behavior of large-scale CIS, the development of computational intelligence tools for monitoring CIS, the investigation and development of fault models for CIS, and the design of methodologies for intelligent management, monitoring and control of CIS. Furthermore, this WG will concentrate on classifying common problems and solutions for each of the research areas of the Action and will develop methodologies for monitoring, control and safety of more than one infrastructure in a common framework.

Working Group 2

Focus on the reliable management and control of electric power systems. The objectives of this WG are to design methodologies for intelligent management, monitoring and control of electricity networks, to design tools for on-line monitoring, and to investigate various mechanisms for cascade network collapse.

Working Group 3

Focus on the reliable management and control of telecommunication networks. The objectives are to investigate security models as they apply to various networks (e.g., wireless, optical), to design methodologies for intelligent management, monitoring and control of communication systems, to develop network security models and use them to enhance network security, and to develop resource allocation and Quality of Service provisioning methodologies.

Working Group 4

Focus on health monitoring and control of water distribution systems. The aim is to design methodologies for intelligent management, control and health monitoring of water distribution systems. Specific objectives include the enhancement of the security of water distribution systems and the development of early detection systems, the investigation of wireless sensor network based solutions for monitoring and control water systems, the optimal sensor and actuator placement for control, health monitoring and security of water systems, and the development of control-oriented models of dynamics in drinking water distribution networks.

Main Achievements:

- Creation of the IEEE Systems Council Technical Committee on Critical Infrastructures
- Pan-European participation across domains
- Significant involvement of ESRs
- Spin off of new national and European collaborative projects

COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract