

# **Common pitfalls that affect Water and Wastewater Instrumentation, Control and Automation Systems**

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## **KEYWORDS**

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## **ABSTRACT**

It is a general belief that plant Instrumentation Control and Automation projects (ICA) will deliver powerful, flexible, and user-friendly technology that more than meet the specific requirements of any particular project while offering a wide range of tools and capabilities. However, the measurement of the cost/benefits of an ICA is generally difficult to determine (Olsson, 2005). The open question that remains is whether these benefits will translate into improved performance and reduction of operational cost. Often, plant managers and executives are unpleasantly surprised to find that a newly installed system does not perform as expected or reinvestment will be needed to update a SCADA system or other component of the ICA. Many factors contribute to project failure. Reviewing some of the most common mistakes can help facility executives reduce risk.

The general objective of this paper is to summarize the most common pitfalls that can affect an ICA system. The paper will evaluate the aspect of design, project implementation, and system operation and maintenance. To achieve the planned objectives, a Delphi methodology (Wechsler 1978) will be designed and implemented in order to develop and execute structural surveys and group discussion that will allow the use of information from the experience and knowledge of the I&C experts and end users.

The specific objectives of this paper are the following:

- Describe the phases of the ICA project and its correspondent effect over the life cycle of an ICA system.
- Explain the correlation between the factors that affect the ICA project execution and overall ICA system lifecycle.
- Describe the methodology of research and survey design.
- Conclude about the major ICA mistakes and strategies to avoid or minimize the impact over ICA project and system lifecycle.

## References

1. Olsson 2005: Instrumentation, Control and Automation in Wastewater System By Olsson, Nielsen, Lynggaard-Jensen, Yuan and Steyer
2. Wechsler 1978: There is agreement that Delphi is an expert survey of two or more 'rounds' in which, in the second and later rounds of the survey the results of the previous round are given as feedback (Cuhls 1998).

Therefore, the experts answer from the second round on under the influence of their colleagues' opinions, and this is what differentiates Delphi from ordinary opinion surveys. Thus, the Delphi method is a 'relatively strongly structured group communication process, in subjects on which naturally unsure and incomplete knowledge is available, are judged upon by experts', write Häder and Häder (1995, p. 12). Giving feedback and the anonymity of the Delphi survey are important characteristics. Wechsler describes a 'Standard-Delphi-Method' in the following way: 'It is a survey which is steered by a monitor group, comprises several rounds of a group of experts, who are anonymous to each other and for whose subjective-intuitive prognoses a consensus is aimed at. After each survey round, a standard feedback about the statistical group judgment calculated from median and quartiles of single prognoses is given and if possible, the arguments and counter arguments of the extreme answers are fed back...' (Wechsler 1978, pp. 23f.).  
 (Source [http://forlearn.jrc.ec.europa.eu/guide/2\\_scoping/meth\\_delphi.htm#Pros\\_Cons](http://forlearn.jrc.ec.europa.eu/guide/2_scoping/meth_delphi.htm#Pros_Cons))

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