Towards Smart Industrial Facilities

M. E. El-Hawary, Life Fellow IEEE,
Dalhousie University, Halifax, Nova Scotia, Canada

The advent of the concept of smart factory (or smart manufacturing) is claimed to revitalize manufacturing industry automation in much the same manner as smart grid has done for the electric power enterprise. The convergence of Information and communication technologies (ICT,) automation of manufacturing processes, and progress in hardware and software is creating strategic innovative advances or a fourth industrial revolution which is referred to as Industry 4.0 (Industrie 4.0), formally proclaimed at the 2011 Hannover Fair (Hannover Messe 2011.)

This presentation begins with an overview of the ingredients of an Industry 4.0 Factory as an evolving entity. The presentation then aims to highlight the fundamental foundational principles, technologies, and design requirements. Specific emphasis will be placed on security challenges, interoperability and autonomy as pertain to reliability and stability.

The presentation is concluded by a narrative on the state of Industry 4.0 world-wide, but emphasizing Europe, Korea, and the US.