Editorial

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SUBSTANTIAL CHANGES IN PROCESS AUTOMATION TECHNOLOGY WITHIN THE LAST 20 YEARS

Field device communication in the last 20 years is distinguished by the change from analog to digital transmission. Three important steps can be pointed out in this context. The first major technological leap occurred in the ‘80s with the change from pneumatic control to 4-20 mA signal control. Parallel developments included the reduction in on-site measuring booths, the construction of measuring stations, and the introduction of control systems. Measuring and control functions were centralized and provided to the operating personnel in the measuring station.

Nobody considered optimizing the overall production process at this time. There was a sense of relief that one had at least an overview of the situation.

Increasing plant utilization became the priority in the ‘90s, with MES, production planning, and recipe operation taking the methods employed.

Control systems had established themselves. The main challenge was horizontal and vertical integration to link the multitude of automation islands together.

CIM – Computer Integrated Manufacturing – was the word on everybody’s lips.

Bus technology with Ethernet took the lead at the production control level, as various control systems with their proprietary systems could also be connected to these. This attempt failed at field level as a result of the particular interests of important manufacturers and most probably also due to the indecisiveness of users when it came to establishing a uniform bus structure.

The consequences of the fieldbus battle can still be felt today, and it is only slowly being realized that the main losers are the manufacturers themselves.

Users are, in fact, not willing to use specific company solutions on a broad scale. Investment security, to them, means

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receiving a long-term solution without any production limitations. This security of investment was achieved with a migration level consisting of HART protocol and remote I/O actuation – a first step on the road to field digitalization. Fieldbus has made its mark only in the last 5 years. After initial pilot projects and the elimination of teething problems, it can be considered as state-of-the-art technology today. A considerable boost is expected from the handshake between Siemens and Emerson, as it promises a pragmatic cooperation between PA and FF. A solution to the trench warfare between FDT and EDDL also appears imminent, as Prof. Bender reported at the NAMUR General Assembly 2006. NAMUR, which has contributed to developments ranging from the 4-20 mA signal to fieldbus with numerous NAMUR recommendations, will also clearly illustrate the future requirements of users as they relate to technology development. The next step is complete digital transmission of data within horizontal and vertical integration. Allocation of functions to process requirements can be adapted if data is available at all times in this manner at every stage of the level model. The rigid coupling of system and function will be shattered. Production requirements relating to the optimization of all cost driver and profit variables such as flexibility, optimal use of raw materials and energy, adherence to production specifications, a pre-defined service level and supply capability can be met as a result.