

Digital or analog: Analog control devices, which date back to the 1950s, tend to be reliable, easily calibrated, and offer relatively simple control options. A disadvantage, however, is the high cost of transmitting its signal (either low voltage electrical signal or a pneumatic signal) over even short distances. The use of an analog-to-digital converter reduces that problem, however, but introduces the requirement to validate the conversion factors and algorithms. Digital monitors, essentially adapting computers to control activities, simplify the data transmission problem, but increase the requirements for calibration and maintenance (needed parts and labor may be in short supply in many parts of the world).

Human operators or inspectors may serve a variety of functions, with their exact role depending on the verification requirements, the characteristics and complexity of the process to be monitored as well as of the instruments used in monitoring, and possibly even the experience and training of those inspector/operators. Generally, inspector/operators would read, record, and report process data collected by the process instruments. They also might examine raw materials and feedstocks, end-products, and waste streams for unusual activity. A necessary task for human operators/inspectors-- whether permanently stationed at a particular facility or on a periodic visit thereto-- will be the calibration, checking, and maintaining of monitoring instruments, data collection, recording and transmission equipment. The inspector also serves as a flexible and adaptable check in a hostile environment. During disposal operations for chemical munitions and agents, for example, it is expected that human inspectors will be present continuously. Thus, they would, in principle, be able to monitor activity in the facility as well as overseeing the instruments that are collecting process data. This may also be case during critical operations when the single, small-scale production facility is in operation. The human inspector should interact with the instruments to provide the most effective means of verification.