

Other types of problems may involve transmission of the data signal to the receiver. A break in the signal wire, for example, can cause a break in the data stream perhaps for a significant period--whether the break was intentional or not. Process operating conditions during this time will be unknown and changes in production rates or products could go unnoticed. Thus the human inspector has an important function to perform.

A hardware failure in the data collector, the communication equipment, or the computer may also result in data loss. Although such equipment is generally of high reliability, it is a problem that can not be ignored. Further, the "uptime" of such equipment is directly related to the skill and speed with which maintenance personnel diagnose and repair the hardware.

An additional issue that must be considered in the design of monitoring instruments is the possibility of deliberate cheating. It could range from a quick, one-time attempt to produce some scheduled chemicals to a conscious, continuing attempt to produce large quantities of proscribed chemicals. Attempts at such cheating, if they were to occur, might be hidden within a large facility being monitored or at an undeclared and unmonitored location. Existing widely are specialty chemical facilities with corrosion-resistant equipment which can be readily adapted to make chemical weapon agent or key precursors. Similar facilities to produce new types of specialty chemicals (e.g., polymers, agricultural products, pharmaceuticals, etc) are sure to be built in the future, raising the possibility of production by unmonitored equipment. These possibilities further raise the need for full time on-site inspectors in critical facilities.

CONCLUSIONS: Current process monitoring practices for normal industrial purposes can serve as the foundation for instruments and monitoring technology which can be adapted and tailored for monitoring chemical weapons production, non-production, and destruction. Much of the instrumentation is available or technically feasible; only engineering the technology into instruments tailored for CW Convention verification use is