

Effective Video Monitoring for Nuclear Safeguards

*Non-scary, but believable video monitoring.
See Science & Global Security 9, 113-141 (2001).*

The Problem

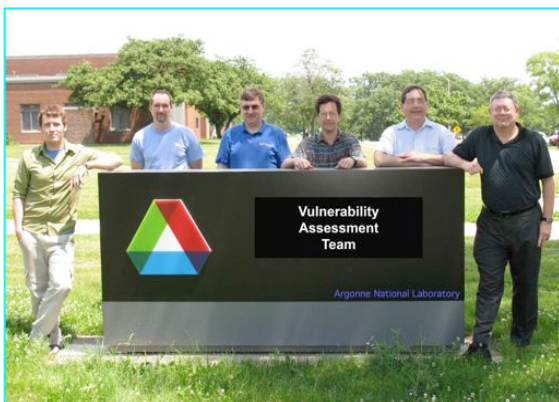
Video monitoring is a powerful technique for international nuclear safeguards, nonproliferation, and dismantlement monitoring, but how do the inspectors know the video is not being faked—especially given that physical and electronic tamper detection to protect cameras is not currently very reliable?

Local Verify

We use the intrinsic high-bandwidth of video and the finite speed of electronic signals to show that the live video images originate locally—not, for example, in some distant Hollywood-like studio designed to fake the video images.

Live Verify

We use off-site video analysis, combined with on-site illumination techniques, chaotic but smoothly varying props (toys & displays), and inspector and facility personnel actions to show that the video images are real-time, and not pre-recorded.



Advantages

- Simple & low-cost
- High levels of confidence in the veracity of the live video.
- Full transparency: No cryptography or secrets.
- Minimizes need for inspectors to be inside facilities.
- Few safety or espionage concerns by the inspected facility and nation.