

Moreover, it can destroy confidence in the honest intentions of others, with effects extending beyond the treaty to the broader political relationship. Assuming they entered it in good faith, no participant wants to disturb the treaty relationship through negligence. With an effective verification regime that the participants believe able to uncover virtually any observable infraction, greater pains will be taken to minimize inadvertent events. In this manner, an effective regime reinforces treaty discipline among the participants, creating a stabler security environment.

### **The Binomial Experiment**

The verification problem is modeled in terms of a binomial experiment. In general, the binomial experiment has the following properties:<sup>7</sup>

- (1) It consists of "n" identical trials ("n" being a positive finite number).
- (2) Each trial results in one of two outcomes — success or failure.
- (3) The probability of success —  $p(s)$  — for a single trial equals the value "p" and is the same for each trial. Conversely, the probability of failure —  $p(f)$  — equals one minus the probability of success  $[1 - p]$  or the value "q."
- (4) The trials are independent.

How do these properties translate to the verification problem? We examine each in turn:

Property (1) — One "look" by the monitoring system in the coverage area represents one "trial." Moreover, all "looks" are assumed to be identical. That is, the operating parameters for each observation are the same — sensor type, target resolution, sensor range, pointing error and instability, imperfections in optics, etc.

Property (2) — Each trial or "look" results in one of two outcomes — the violation is detected (success) or it is not (failure). Operationally, no such dichotomy exists; the technical evidence of a possible violation is often ambiguous, in which case the event in question is monitored until its meaning becomes apparent and/or a request for clarification is made. However, its use here refers to the broader political context in which questions of compliance are decided. "Success" (a violation is detected) implies that the technical evidence from one "look" of the monitoring system is conclusive; that is, the political authorities are satisfied that, on the basis of this evidence, a violation has taken place and an accusation to this effect can be supported (although other considerations may argue against actually