militarily significant violation at least once during the required search interval also increases.

Next, consider changes in the "look" rate. Assume the aircraft sortie rate [r] is increased 2 1/2 times to 2.18 sorties per day (the number of flight hours on surveillance missions is increased from 8.1 to 20.3 hours per day; these operational demands could be met through an expanded fleet and/or higher utilization rates for currently tasked aircraft). This higher sortie rate translates into a higher number of "looks" by the airborne sensor during the five-day search interval; in this instance, approximately 11 sorties are flown [L = 11]. Figure A-2 compares the overall detection probabilities calculated assuming this heightened sortie rate with the base case presented in Figure A-1. As illustrated here, the higher "look" rate raises the overall detection probability at each level of system sophistication.

Alternatively, the area of the search swath may be expanded by using wider-area sensors and/or systems. For a satellite-borne sensor monitoring a 777 000 km^2 swath (2 400 km × 320 km) on each orbital pass, the probability of observation equals 777 000/5 965 044 or .13 (the ratio of the search area to the coverage region). The probability of detection, then, for each "look" is higher than in the base case across the range of values for p(i). Figure A-3 compares satellite surveillance with "heightened-sortie" aerial surveillance discussed above. The number of "looks" are assumed to be the same for both systems. Differences in the overall detection probability estimates, then, result from differences in the values calculated for the probability of observation. The figure illustrates that the overall probability of detection for the wider-area search system is greater at corresponding levels of system sophistication.

It has been argued that satellite systems, with their wider surveillance swath, compound the data analysis problem, producing an overwhelming amount of data that, in many instances, prevents timely interpretation. These arguments do not recognize that data analysis is only a secondary task in the deterrence process; it is done primarily to reassure the inspector that deterrence is "working," not to deter the inspectee. From the inspectee's perspective, the deterrent effect of the surveillance system lies in the act of monitoring itself. It cannot be predicted with confidence whether all, some, or none of the data are actually scrutinized. What is certain, however, is that activities within the coverage area are being monitored and that an inadvertent violation will likely be observed within a relatively short time. It is this ongoing threat of observation that reinforces compliance with the treaty. Whether all the data from these observations are analyzed is virtually irrelevant from a deterrence perspective; as long as the potential violator believes some of it is analyzed, he cannot risk assuming that what is observed will not be identified. Consequently, he will take greater pains to guard against inadvertent violations. Thus, the data problem becomes less imposing for wider-area search systems, arguing for their continued usefulness in monitoring extensive coverage areas.