

theater to connect the headquarters of major commands or authorities. In addition this next phase can give us an important capability to supplement the capacity of the Defense Communications System where necessary.

Because we will shortly be issuing requests for proposals in connection with the next phase of the system, I feel it is inappropriate to discuss the details of design further at this time.

I would however like to review for you some of the factors which have influenced our planning of this next phase.

The technology of satellites and of satellite communications, in particular, has been and is evolving very rapidly. This evolution is driven by the R. & D. programs sponsored by the DOD, by NASA, by the Comsat Corp. and private industry. A continuing sequence of experimental and operational satellites have been flown. Most have incorporated and tested innovations or modifications of satellite technology. The cumulative effect of this innovation, testing and evaluation leads from time to time to the engineering judgment that a new level of operational performance is feasible. A particularly striking example has occurred in the past year. Last summer the evidence was in hand to support the judgment that satellites which kept stationary positions above the earth and provided antenna beams which concentrated most of their power in the direction of the earth could be confidently designed for operational use. The accumulation of engineering experience with satellite borne sensors, motors, bearings, electronics, and controls has led, in the past several months, to the confidence that mechanical platforms can be provided and controlled on satellites which are stable in their orientation to within less than a degree in angle, and that mechanisms for steering and pointing antennas can be provided on these platforms and controlled to comparable accuracy, and that such systems can attain mean-times-to-failure measured in years. Thus the combined effects of progress in many areas of technology has made prudent the use of narrow beam antennas for operational systems. Because these antennas concentrate their radiated power into a small area of the globe they can deliver within that area 100 times the power that could otherwise have been delivered.

Thus a very important new option has become available.

During this same period, in reviewing our experiences in Southeast Asia and elsewhere, we have gained very clear appreciation of the role which high quality, rapidly established communications channels can play as contingency situations unfold. In Southeast Asia we have spent hundreds of millions of dollars providing long-range communications to and within the theater. Since much construction was required for these conventional fixed plant facilities, the full communications capacity has often lagged many months behind the buildup of forces.

The realistic possibility of narrow beam steerable antennas and smaller highly transportable terminals, together with the clear requirement for a capability for rapid buildup of command communications in contingency situations has led to a qualitative shift in our thinking and planning for the next phase of the Defense Satellite Communications System.