

TEST SET AVAILABILITY

To better understand test set degradation, we assessed tester availability. Figure B.1 shows the average monthly LANTIRN Intermediate Automatic Test Equipment (LIATE) mission-capable (MC) rate for test strings at five bases. The bases were chosen because they represent locations with combat-coded aircraft that could potentially deploy for contingencies and have used the same test sets over the three-year period charted. We show LIATE MC rates because this subsystem’s performance drives overall LMSS MC rates. The dashed line represents bases with single test sets and shows no marked per-

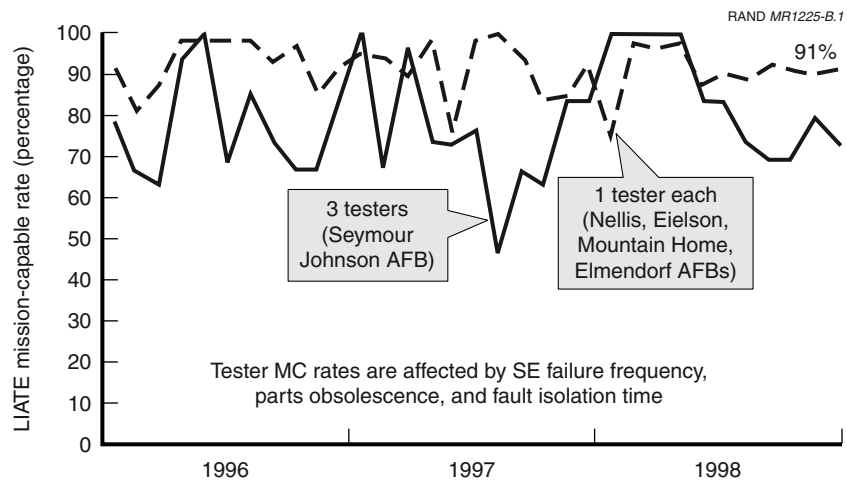


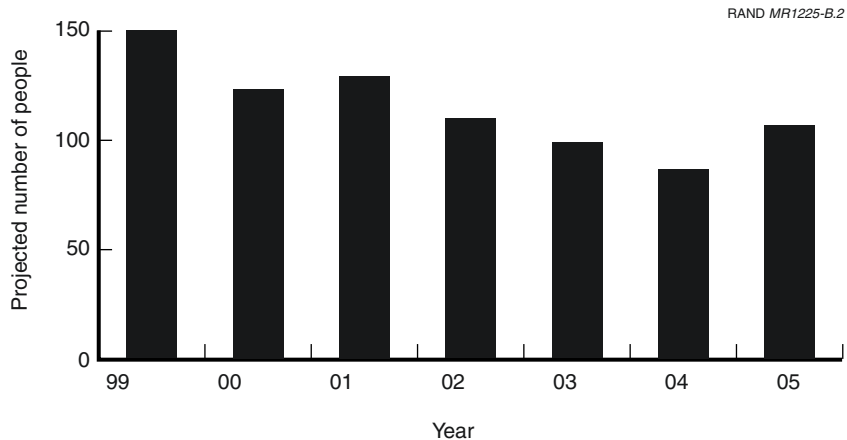
Figure B.1—LIATE Tester MC Rates Over Three Years

formance degradation over three years. The solid line represents Seymour Johnson AFB data where three sets operated in concert and the line also shows no degradation. Note that this base shows much greater MC rate variation and typically performs below the single bases assessed. Although we expect that collocated test set average performance would be greater, our detailed examination of the data indicates otherwise. We believe that one of the main issues driving this anomaly is that all data represent peacetime operations. Thus, whereas single-set bases have to maintain their one tester at peak performance at all times, bases with additional testers may not have as high an urgency, in that not all sets are required to support peacetime operations. The effect is that collocated test sets may stay unrepaired for longer periods of time, driving MC rates down. Because the single-string bases represent achievable performance levels, we used the latest MC rate (90 percent) for our baseline assessment and extrapolated collocated test set performance using relationships developed in an associated RAND study.¹

Tester availability is driven by three major elements: test set failure frequency, fault isolation time, and availability of spare parts to repair the failure. Test set failure frequency and fault isolation time data were not available, so we looked at overall tester MC rates and forecasted technician resources data to assess possible future equipment performance levels. Operator skill levels most affect fault isolation time; the more skilled the operator, the less time needed to isolate equipment problems. Because the most highly skilled sensor personnel are leaving the Air Force at an increasing rate (shown in Figure B.2), the overall skill level of LANTIRN technicians is decreasing, leading us to expect longer process times. However, we could not draw a direct correlation between these trends and MC rates.

Given that the data do not show a distinct support equipment degradation trend, we developed a matrix approach to possible future equipment performance with no investment and the upgrades described in the body of this report. Figure B.3 shows the two

¹See Eric Peltz, Hyman L. Shulman, Robert S. Tripp, Timothy Ramey, Randy King, and CMSgt John G. Drew, *Supporting Expeditionary Aerospace Forces: An Analysis of F-15 Avionics Options*, RAND, MR-1174-AF, 2000. See also footnote 3 of Appendix A.



SOURCE: AFPOA/DPYE.

Figure B.2—Projected Numbers of Sensor-Coded Personnel (> 10 years of service)

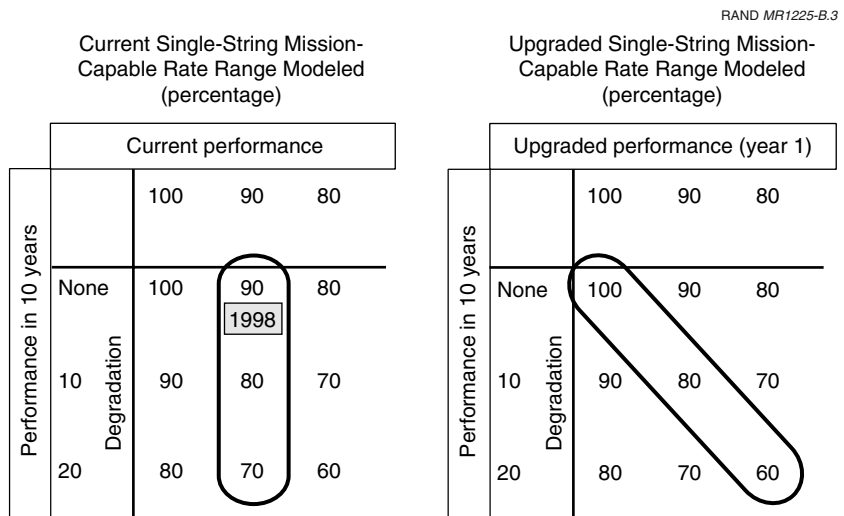


Figure B.3—Possible Performance of Support Equipment

matrices we used to assess the effects of future support equipment performance.

The matrix on the left shows a range of 100 to 80 percent MC rate for the current equipment. We had shown that single test sets perform at about 90 percent. Next, we show on the vertical axis a range of potential degradations over the next 10 years, from 0 to 20 percent. So, the potential performance levels in the future may range from 90 to 70 percent. We use these ranges in our sensitivity analysis in Appendix F. The matrix on the right shows a similar approach for the upgraded equipment. Because the cost differences between an ADK and MLU investment are negligible and it is difficult to assess the incremental performance difference between the two upgrades, we model the new equipment using one range of possible performance levels. At the upper limit, the new equipment may perform at 100 percent in the first year—it is difficult to measure this starting point because few data are available. Again, on the vertical axis we show a range of possible degradations over time. Now, the possible performance range becomes 100 to 60 percent. We discuss the implications of this range in Appendix F.