

AESA / AUTOMATIC CARRIER LANDING SYSTEM COMPATIBILITY TESTING

Author

Ronald S. Menello

Aerospace Engineer

NAWCAD 5.1.6.10, Air Traffic Control and Landing Systems

ABSTRACT

Automatic Carrier Landing System (ACLS) compatibility testing of the F/A-18E/F APG-79 Active Electronically Scanned Array (AESA) radar was performed from August 2006 to August 2008. Using this test project as an example, it will be shown that there is no substitute for flight test to evaluate operational suitability of a highly complex system of systems where significant elements are first generation.

To evaluate the compatibility of the F/A-18E/F APG-79 AESA with US Navy (USN) SPN-46 ACLS, not only must the system be flight tested, but the aircraft with the array radar installed must be flight tested aboard a ship while at sea. This is in large part due to the fact that the electromagnetic environment around a USN aircraft carrier is unique and very difficult to adequately simulate in a shore based environment. As a result, the compatibility of the APG-79 AESA radar and SPN-46 ACLS could only be truly evaluated in the actual operational environment. This was best illustrated to the test team when, after extensive testing at a shore-based facility designed to simulate the shipboard environment as closely as possible, a solution to a deficiency was identified but later failed during shipboard testing. This paper will discuss the processes the test team went through that led to the initial shipboard testing, the effort put forth to refine the methodology and data collected for subsequent shore based tests, and how that data was used to make a go/no go decision on additional shipboard testing.