

Case Study: Boeing Sea Launch Weather Radar

Requirement: A sophisticated Doppler weather radar system that will operate on board the command ship in support of commercial satellite launches at sea.

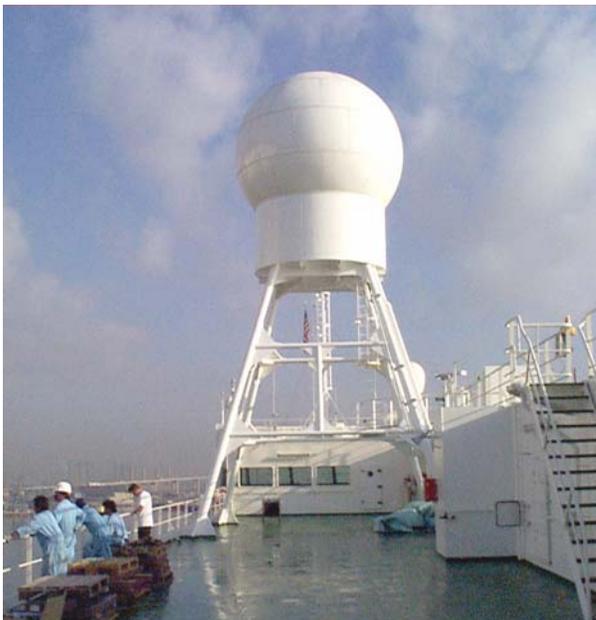
Solution: A modified version of the model TDR 3070-C Doppler radar.

Sea Launch's mission is to launch communication satellites from a location at sea. The ship, Sea Launch Commander, is a floating "mission control" facility. The TDR 3070-C is installed onboard the Sea Launch Commander both to support the launch activities, and to assist the Commander in crossing the Eastern Pacific hurricane track while going between its home port (Long Beach, CA) and the mid-Pacific launch location.

The TDR 3070-C, in conjunction with Sigmet's IRIS software, provides a full range of reflectivity, velocity and spectrum width products, including volume scan products. The sensitivity of the TDR 3070-C permits the detection of high altitude ice crystals which are a precursor of triggered lightning, one of the major concerns during satellite launches.

The standard TDR 3070-C antenna controller was replaced with an antenna controller from Sigmet, Inc. along with new antenna servo motors, and an inertial motion reference unit. The result is an antenna that is stabilized to within $\pm 0.1^\circ$ pointing accuracy in spite of the ship's pitch and roll motion. Velocity products are corrected for the ship's speed and direction. Thus, the full range of weather radar capability is available in any sea conditions while the ship is stopped or in motion.

The exclusive TDR precision offset feed antenna minimizes clutter reflections from waves on the sea surface. This is particularly important for Sea Launch, because moving clutter cannot be filtered without risking the loss of important weather event data.



This installation provides a full set of Doppler weather radar data products, including volume scan products, whose quality and accuracy is comparable to the best shore-based systems.

Even in the RF-dense environment of a satellite launch complex, the fully coherent TDR 3070-C provides superior performance without interference to, or from, other launch systems.

◀ **Sea Launch Commander weather radar tower. TDR 3070-C radar with stabilized 3 m offset feed antenna and 18' radome.**