

#### 10A.4

### ATLANTIC BASIN TROPICAL CYCLONE EVASION BY UNITED STATES NAVY SHIPS VIA OPTIMUM TRACK SHIP ROUTING (OTSR)

Atlantic Basin tropical cyclones pose significant challenges to the operational readiness and safety of United States ships and afloat personnel. During tropical events, the Naval Atlantic Meteorology and Oceanography Center applies a broad range of meteorology products and skills, in consultation with the National Hurricane Center, to recommend appropriate evasive actions for assets afloat. Even though a tropical cyclone may be hundreds of miles from land, or perhaps, not threatening coastal interests at all, platforms afloat (including ships of the U.S. Navy, NOAA, Coast Guard, Army, in addition to Allied Navies) may well be threatened. Due to relatively slow speeds and vulnerability in heavy winds and seas, tropical cyclone warnings and evasion recommendations must be developed, coordinated, and promulgated well ahead of the onset of destructive weather.

During Hurricane Alberto, two groups of U.S. Navy ships were transiting the Atlantic; one group returning home after deployment, and the second group proceeding eastward to meet scheduled commitments. Forecasting potential hurricane impact on the two groups required the entire suite of forecast tools and models reaching out to at least 144 hours. This because the expected recurvature of the hurricane had the potential to impact ship tracks over the course of the next 6 – 7 days. Through nearly continuous communications with the afloat staffs, together with consideration of all available and pertinent meteorological data, beneficial evasion actions were accomplished. The eastbound group increased speed along their track and outran the Alberto threat while the westbound group initiated various track/speed diverts to successfully evade.

As Hurricane Debby progressed along its track, the 72-hour forecast indicated a threat to southeast Florida and the Florida straits. Subsequent forecasts began to shift the 48 and 72-hour tracks further westward across the Florida Keys and into the eastern Gulf of Mexico. Over 20 U.S. Navy and Coast Guard ships in the vicinity of the Florida Straits would potentially be affected. By coordinating with various staffs and the ships themselves an agreement was reached to evade Debby by proceeding to a point south of the Yucatan Channel. This evolution required sufficient transit time to arrive at the recommended evasion point, prior to the onset of destructive winds and seas. However, prior to the ships diverting significant distances, Debby suddenly weakened, then dissipated. As a result, the evasion recommendations were rescinded and units resumed scheduled operations. This experience was an example of effective coordination between ships, staffs, OTSR, and the National Hurricane Center in responding to the dynamic and innately uncertain nature of tropical cyclones.

Since September 11 2001, Homeland Defense has become a major consideration of the (CONUS) military weather forecasting mission. This is especially true during tropical season, requiring accurate forecasting of tropical cyclone strength, wind/sea radii, and movement at and beyond the 72 hour forecast period. The U.S. Navy has tropical cyclone forecast responsibilities with respect to the potential need for evacuation of battlefield detainees at Naval Base, Guantanamo Bay, Cuba. This specific mission, though relatively new, requires accurate and relatively long-range tropical cyclone forecasting capabilities.

The operational requirements documented above highlight the importance of close coordination of all forecasting and response agencies to minimize the adverse effects of tropical cyclones in the Atlantic Basin. These issues substantiate the need for continued research in forecast movement, wind/sea radii, and other areas beneficial to the operational military community ashore and afloat.