

2011

**NASA Range Safety
Annual Report**

IV. CENTER REPORTS

A. Ames Research Center

Ames Research Center (ARC) operates or oversees the operation of a variety of UAS for Earth science missions, flight controls research, and technology demonstration. The largest ARC UAS is the Science Instrumentation Evaluation Remote Research Aircraft (SIERRA) (Figure 9), which has a wingspan of 20 feet and a takeoff gross weight of 370 pounds and a payload capacity up to 100 pounds. SIERRA is capable of cruising at 55 knots for over 10 hours.



FIGURE 9: SCIENCE INSTRUMENTATION EVALUATION REMOTE RESEARCH AIRCRAFT (SIERRA) UAS

In June, a research team took the SIERRA to Railroad Valley, Nevada to conduct an air sampling mission over the high desert playa. Operations were conducted from a dirt runway utilizing a mobile Ground Control Station in a van to chase the aircraft to the sampling sites. The SIERRA performed 5 flights totaling 8.6 hours during the successful deployment.

The long transit distances and large area of overflight presented challenges to the Range Safety personnel. Multiple safety observers coordinated closely to meet the see-and-avoid responsibility effectively and to deconflict issues involving other airborne traffic.

ARC has also developed an electric conversion of a giant scale radio-controlled aircraft, calling it the Giant Scale Electric Trainer (GSET) (Figure 10). The GSET has a wingspan of 80 inches and weighs 15 pounds. It is used for proficiency and currency flights and to train and checkout new pilots. The GSET is a surrogate aircraft for these routine operations, allowing ARC to avoid putting more valuable UAS at risk.

The GSET was first flown at the more remote UAS operating site of Crows Landing. The accumulation of successful flights demonstrated the reliability of the aircraft systems and the proper function of the primary contingency management system (failsafe). This allowed the range safety analysis required for the GSET to return to the more densely populated Moffett Federal Airfield and operate within range safety guidelines.



FIGURE 10: GIANT SCALE ELECTRIC TRAINER UAS