| **MISSION PLAN** | | | |
| --- | --- | --- | --- |
| **FLIGHT ID** | 20220920I1 | **STORM** | AL07 / FIONA |
| **MISSION ID** | 2107A | **TAIL NUMBER** | NOAA43 |
| **TASKING** | EMC/NHC | **PLANNED PATTERN** | Modified Butterfly |
| **MISSION SUMMARY** | | | |
| **TAKEOFF [UTC]** | 2003 | **LANDING [UTC]** | 0503 |
| **TAKEOFF LOCATION** | Lakeland | **LANDING LOCATION** | Lakeland |
| **FLIGHT TIME** | 9.0 | **BLOCK TIME** | 9.3 |
| **TOTAL REAL-TIME RADAR ANALYSES**  **(Transmitted)** | 7 (7) | **TOTAL DROPSONDES (Good/Transmitted)** | 41 (40 / 34) |
| **OCEAN EXPENDABLES (Type)** | 4 AXBT (ONR) (4 good) | **sUAS (Type)** | None |
| **APHEX EXPERIMENTS / MODULES** | Mature Stage Experiment: Surface Wind and Wave Validation, NESDIS Ocean Winds; Early Stage Experiment: AIPEX (FLAIMS) | | |
| **HRD CREW MANIFEST** | | | |
| **LPS ONBOARD** | Holbach | **LPS GROUND** | Hazelton |
| **TDR ONBOARD** | Holbach | **TDR GROUND** | Gamache |
| **ASPEN ONBOARD** | Murillo | **ASPEN GROUND** | None |
| **NESDIS SCIENTISTS** | Chang, Jelenak, Sapp, Bjorland | | |
| **GUESTS (Affiliation)** | Camposano (UM/RSMAS/CIMAS), Alexis Rudd (US Senate Staffer) | | |
| **AOC CREW MANIFEST** | | | |
| **PILOTS** | Mitchell, Doremous, Keith | | |
| **NAVIGATOR** | Utamo | | |
| **FLIGHT ENGINEERS** | Darby, Pittman, Tyson | | |
| **FLIGHT DIRECTOR** | Carpenter | | |
| **DATA TECHNICIAN** | T. Richards | | |
| **AVAPS** | Warnecke | | |

| **PRE-FLIGHT** | |
| --- | --- |
| **Flight Plan** | Pattern: Fly butterfly pattern with 105 nmi legs  Altitude: 10 kft (pressure altitude)  Potential add-on Modules:   * Surface Wind and Wave Validation * FLAIMS Module (AIPEX)   33 sondes (all dropsondes transmitted to the GTS); 5 ONR/NRL AXBTs (all AXBTs transmitted to the AOC ground server if possible) |
| **Expendable Distribution** | Release sondes at endpoints, midpoints, centers; possible supplemental rapid RMW drops |
| **Preflight Weather Briefing** | Fiona is a Category 3 hurricane with 100 knot winds. The TC appears to have just completed an eyewall replacement cycle, and the eye is clearing out again with pressure falling.    The storm is slowly moving off to the north and northeast, recurving away from the CONUS. |
| **Instrument Notes** | None |

| **IN-FLIGHT** | |
| --- | --- |
| **Time [UTC]** | **Event** |
| 2003 | Takeoff from KLAL |
| 2017 | MMR being restarted |
| 2026 | MMR back up |
| 2050 |  |
| 2155 | IP sonde 1, 22.46N 73.30W |
| 2206 | Midpoint (MP) drop 22.5N 72.42W |
| 2215 | RMW Drop 3 22.47N 72.3W |
| 2217 | RMW Drop 4 22.4N 71.57W |
| 2218 | RMW Drop 5 22.46N 71.52W |
| 2221 | Center Drop 6 22.46N 71.36W |
| 2230 | RMW Drop 7 |
| 2230 | RMW E Drop 8 |
| 2231 | RMW E Drop 9 |
| 2236 | MP Drop 10 22.4N 70.54W |
| 2241 | There is a pretty cellular rain band by our EP so we are going to turn downwind before we reach that |
| 2242 |  |
| 2244 | Endpoint (EP) drop 11 22.45N 70.3W |
| 2246 |  |
| 2254 |  |
| 2301 | Endpoint sonde 12, AXBT drop, 23.42N 71.9W |
| 2301 | Heading inbound for fix, then back out for FLAIMS |
| 2308 |  |
| 2211 | Center sonde 13 22.51N 71.37W, AXBT #2 |
| 2323 | Heading back out NE for FLAIMS module |
| 2329 |  |
| 2336 |  |
| 2336 | Planning FLAIMS module sondes: 5 RMW in, 1 center, 1-2 RMW out |
| 2342 | RMW NE Sonde 14 23.12N 71.23W |
| 234348 | RMW NE Sonde 15 23.8N 71.26W |
| 234447 | RMW NE Sonde 16 23.5N 71.28W |
| 234508 | RMW NE Sonde 17 23.5N 71.29W |
| 234541 | RMW NE Sonde 18 23.3N 71.31W |
| 2349 | Center Sonde 19 22.53N 71.42W |
| 000208 | RMW Sonde 20 22.40N 71.51W |
| 000219 | RMW Sonde 21 22.38N 71.53W |
| 000320 | RMW Sonde 22 22.36N 71.55W |
| 0008 |  |
| 0008 | Midpoint drop 23 22.21N 72.8W |
| 0011 |  |
| 0024 | Endpoint drop #24 21.45N 72.47W |
| 0044 | Planning to do inbound leg as planned then break off into research radials before final outbound pass to NW |
| 0056 | Sonde 25 (Combo drop, AXBT 3) 21.39N 71.3W |
| 0059 | AXBT SSTs so far: SSTs 1) 29.00C, 2) 27.98C, 3) 27.54C |
| 0104 | Possible concentric eyewalls |
| 0106 | Midpoint drop #26: 0106Z 22.23N 71.25W |
| 0110 | RMW drop #27 22.36N 71.34W |
| 0112 | RMW drop #28 22.44N 71.39W |
| 0113 | RMW drop #29 22.47N 71.40W |
| 0117 | Center drop #30 22.59N 71.48W |
| 0126 | Outbound 030 |
| 013525 | RMW Sonde #31 23.12N 71.39W |
| 013558 | RMW Sonde #32 23.1N 71.51W |
| 013618 | RMW Sonde #33 23.9N 71.41W |
| 0141 | Orbiting to get splash point for overflight, 23.198N 71.796W |
| 0142 |  |
| 0200 | Heading back inbound from N |
| 0219 | Heading inbound from NE |
| 022423 | RMW Sonde 34 23.14N 71.35W |
| 022453 | RMW Sonde 35 23.13N 71.36W |
| 022533 | RMW Sonde 36 23.11N 71.38W |
| 0237 | 23.2299N 71.7519W is splash point |
| 0239 |  |
| 0249 | Final radar analysis |
| 0252 |  |
| 025555 | RMW Sonde 37 23.19N 71.5W |
| 025627 | RMW Sonde 38 23.19N 71.5W |
| 025649 | RMW Sonde 39 23.2N 71.52W |
| 0308 | Midpoint Sonde 40 24.3N 72.12W |
| 0324 | Combo Away (AXBT 4, Sonde 41) 24.5N 72.53W, SST 29.52C |
| 0325 | Science Complete |

| **POST-FLIGHT** | |
| --- | --- |
| **Mission Summary** | The mission was a successful TDR butterfly with a FLAIMS module added on as well as several SFMR validation sonde overflights and NESDIS Ocean Winds radial legs.  Fiona was completing an ERC and strengthened throughout the flight, becoming a high-end Category 3 hurricane by the end of the flight. Max SFMR in HDOBs was 112 kt, max 1-sec SFMR was 59 m/s, and max flight-level in HDOBs was 120 kt. 8 eyewall penetrations.  We were able to drop 41 sondes including quite a few in the RMW to sample the wind field of the intensifying TC. |
| **Actual Standard Pattern Flown** | Butterfly with a FLAIMS module, overflight of dropsonde splash locations, and Ocean Winds legs. |
| **APHEX Experiments / Modules Flown** | Modules were flown for the *Mature Stage Experiment* with the *Surface Wind and Wave Validation* and *Ocean Winds*. Though the storm was well into the mature stage, the *Flight-level Assessment of Intensification in Moderate Shear (FLAIMS)* *Module*, part of the *Early Stage Experiment: Analysis of Intensity Change Processes (AIPEX)* was also flown. |
| **Plain Language Summary** | * Hurricane Fiona was strengthening through the flight. * We collected data for NHC (storm characteristics), data assimilation into the Hurricane Weather Research and Forecasting (HWRF) and Hurricane Analysis and Forecast Systems (HAFS) models, and instrument validation of surface winds. |
| **Instrument Notes** | Instruments worked well |
| **Final Mission Track** |  |