Lead Project Scientist

Date 10/18/19 **Flight ID** 20191018I1

Storm or Project ALIC/NESTOR **Experiment name** EMC / EARLY STAGE

Mission ID 0516A

Pre-flight

- ☐ 1. Participate in general mission briefing.
- ☐ 2. Determine specific mission and flight requirements for assigned aircraft.
- ☐ 3. Determine from AOC flight director/meteorologist whether aircraft has operational fix responsibility and the mission designation.
- ☐ 4. Contact HRD members of crew to:
  a. Assure availability for mission.
  b. Review field program safety checklist
  c. Arrange ground transportation schedule when deployed.
  d. Determine equipment status.
- ☐ 5. Meet with AOC flight director and navigator at least 3 hours before take-off for initial briefing.
- ☐ 6. Meet with AOC flight crew at least 2 hours before take-off for crew briefing. Provide copies of flight requirements and provide a formal briefing for the flight director, navigator, and pilots.
- ☐ 7. Report status of aircraft, systems, necessary on-board supplies and crews to Field Program Director.
- ☐ 8. Before take-off, brief the on-board GPS dropsonde operator on times and positions of drop times.
- ☐ 9. Make sure each HRD flight crew member has a life vest.
- ☐ 10. Perform a headset operation check with all HRD flight crew members. Make sure everyone can hear and speak using the headset.

In-Flight

- ☐ 1. Confirm from AOC flight director that satellite data link is operative (information).
- ☐ 2. Confirm camera mode of operation.
- ☐ 3. Confirm data recording rate.
- ☐ 4. Complete Lead Project Scientist Form.
- ☐ 5. Check in with the flight director to make sure the mission is going as planned (i.e. turns are made when they are supposed to be made).

Post-flight

- ☐ 1. Debrief scientific crew.
- ☐ 2. Gather completed forms for mission and turn in to data manager at HRD.
- ☐ 3. Obtain a copy of the 10-s flight listing from the AOC flight director. Turn in with completed forms.
- ☐ 4. Obtain a copy of the radar DAT tapes. Turn in with completed forms.
- ☐ 5. Obtain a copy of serial flight data on thumb drive. Turn in with completed forms.

[**Note**: all data removed from the aircraft by HRD personnel should be cleared with the AOC flight director.]

- ☐ 6. Report landing time, aircraft, crew, and mission status along with supplies (tapes, *etc.*) remaining aboard the aircraft to Field Program Director
- ☐ 7 Determine next mission status, if any, and brief crews as necessary.
- ☐ 8. Notify Field Program Director as to where you can be contacted and arrange for any further coordination required.
- ☐ 9. Prepare written mission summary using **Mission Summary** form.

Lead Project Scientist Check List

Storm or Project AL16 / NESTOR **Experiment name** EMC / EARLY STAGE

Flight ID 20191018I1 **Mission ID** 0516A NESTOR

A. Participants:

Function	Participant	Function	Participant
Lead Project Scientist	ZAWISLAK	Flight Director	LUNDRY / FLAHERTY
Radar	EHRBAR	Pilot	DIDIER (AIC)
Workstation		Pilot	ROSSI / LEGIDAKES
Cloud Physics		Navigator	URATO
Dropsonde	ZAWISLAK	Systems Engineer	
Dropsonde		Data Technician	NAEHER
AXBT/AXCP		Electronics Technicians	
Observer/Guest			
Observer/Guest		Flight Engineer	

B. Take-off and Landing Times and Locations:

Take-Off: 2349 UTC Location: LAKELAND

Landing: 0432 UTC Location: LAKELAND

Number of Eye Penetrations: ϕ

C. Past and Forecast Storm Locations:

	Date/Time	Latitude	Longitude	MSLP	Maximum Wind
	18/2100Z	27.0	88.5	999MB	50 KT
FCST	19/0000Z	28.0	87.4		55 G65
	19/0600Z	28.9	86.2		55
	/				
	/				

D. Mission Briefing:

PLAN IS FOR A BUTTERFLY PATTERN, 105 AND LEGS, NOW STARTING FROM THE EAST, SO 090→270, 210→030, 330→150°. THOUGH WX WILL MAKE IT CHALLENGING GIVEN ALL OF THE WX B/W LAKELAND AND THE STORM, WHERE MOST OF THE PRECIP IS. THE CENTER IS EXPOSED TO THE WEST OF THE PRECIP, THOUGH SOME PRECIP IS NORTH AND AND EVEN SOME WEST OF THE PATTERN. SO EXPECTING SOME BETTER CONDITIONS TO THE SW, WHEN WE MAY BE ABLE TO CLIMB UP SOME, BUT WILL DEPEND ON MOONLIGHT AND BEING ABLE TO MAINTAIN VISUAL.

Lead Project Scientist Event

Date 10/18/19 **Flight ID** 20191018 I9 **LPS** ZAWISLAK

	Time	Event	Position	Comments	
	2349Z	TAKEOFF UAL		HEADED TOWARDS THE STORM WE'RE LOOKING AT A LOT	
				OF PRECIP ENROUTE TO THE STORM GIVEN THAT MOST OF	
				IT IS ON THE E SIDE NOT MUCH OVER THE CTR	
	0016Z		29°3' / 83°36'	SO WE'RE GOING TO	
				ADJUST THE FIRST POSI TO 060 → 240° JUST FOR	
				THE FACT THAT WE'VE JOGGED NORTH SINCE TO GET AROUND	
				THE CONVECTION, THEN ROTATE 90°	
				COUNTERCLOCKWISE FOR THE OTHER LEGS	
			STILL REALLY GOOD CONVECTION BREWING ON THE EAST SIDE WHICH WE WON'T GO THROUG		
			WILL THE END. COULD STILL GET SHOWERS ON N/NW SIDE →	JUST MUCH SHALLOWER	
✓	0042	SONDE #1 IP	29°10' / 85°38'	FIRST SONDE NORTH OF THE IP SINCE CELL WILL BE	OB1
				ON THE IP	
✓	0055	SONDE #2	28°44' / 86°29'		OB2
✓		SONDE #3 MID1	28°43' / 86°30'	→ MIDPOINT SONDE	—
✓	0108	SONDE #4	29°11' / 87°23'	"CTR" SONDE	OB3
✓	0121	SONDE #5	27°39' / 89°19'	MP ON OUT 240°	OB4
✓	0131	SONDE #6	27°13' / 89°2'	END POINT SONDE ON 240°	OB5
			SO WE WENT UP TO 20 KFT ON INBOUND NEAR MIDPOINT WHICH WE GOT IN CLEAR		
			BUT WSRA NOT GETTING DATA. SO DECIDED TO DO REST OF LEGS AT 20 KFT TO GET DEEP		
			DROPS NEAR CTR. THEN BACK BOX DOWN ON DOWNWIND, AND STAY AT 10 KFT FOR		
			DURATION TO GET GOOD WIND DATA		
✓	0157	SONDE #7	26°54 / 87°1	NOW INBOUND FROM THE SOUTH TO NORTH, MP #3	OB6
			NOT MUCH WE OUT HERE GET GOOD WSRA, BUT NOT MUCH IN		
			RAMA → HURRICANE WHERE WE GET NNW OF THE CTR		
✓	0208	SONDE #8	27°42' / 87°2'	MIDPOINT INBOUND	
			NOT MUCH PRECIP INBOUND		

28.13
87.42

SHOULD HAVE STAYED LONGER
FOR WSRA
BUT ALSO NOT GETTING DEEPER DROP.

28.38 / 87.14

Lead Project Scientist Event

Date 10/19/19 **Flight ID** 20191019I2 **LPS** ZAWISLAK

Time	Event	Position	Comments	
0214Z			HEADING INBOUND 180° JUST NOT MUCH PRECIP, BUT WE CAN DO WITH. GET FL WINDS, HOPEFULLY GET A BETTER CENTER	
0233Z ✓	SONDE #9	29°31' / 86°59'	MIDPOINT OUTBOUND 360° → JUST OUTSIDE STRONG BAND	
0242Z ✓	SONDE #10	30°10' / 87°1'	EYE OF LEG TO NORTH TURN DOWNWIND	OB 9
		NOW GOING DOWNWIND, PRECIP SHOWS SOME	NOT ANY EVEN THOUGH THE IR	
		LOOKS LIKE SOME PRECIP BAND IS TRYING TO MOVE AROUND THE CENTER FROM STRONG		
		COLD FRONTAL TYPE RAINBAND NOT APPARENT -DOWNWIND		
0300		NOW TO NW DOWNWIND, JUST NOT PRECIP WISE	INTERESTING VS. SATELLITE DATA	
0301	[redacted]	29°40' / 88°25	TURNING INBOUND ON 300 TO CTR	
0308 ✓	SONDE #11	29°35' / 88°21	NOW INBOUND ENDS DROP	OB 10
0317	SONDE #12	29°4' / 87°26'	MF INBOUND 300 CLOSER TO STRONG PRECIP	
0321 ✓	HEADING INBOUND CLOSER TO CTR → HITTING		JUST STRONG BANDING AREA	OB 11
			TO THE NW AND N OF CTR	
		NOT TREMENDOUSLY HIGH ECHO TOPS 12 KM OR SO		
0323		LOOKS LIKE WE HIT A PRESUMPTIVE CLOSE TO THE CTR LOCATION?	A MOMENT FL CTR	
0329		28°39' / 86°39'	SO STILL NO PRECIP AND WE'RE NOW OUTBOUND	
			ON RD → BUT WE WILL ENCOUNTER IT CLOSE TO OUR ENTRY POINT ON RD	
0334		28°29' / 86°16'	SO ALREADY DEVIATING ABOUT OF TIME TO GET AROUND STORM	
			VERY STRONG, POSSIBLY SEVERE STORM	
0340 ✓	SONDE #13	28°29' / 85°48'	RAINBOW OUTBOUND PRECIP 090° NOW.	OB 12
		ALMOST SUPERCELLULAR	LOTS OF LIGHTNING VERY STRONG	
			CONTINUE OUTBOUND	
0349 ✓	SONDE #14	29°31' / 84°59'	SO JUST OUTSIDE LINE/ECHO (WEST) OF SEVERE BAND	OB 15
			GOING TO TRY AND DIG THROUGH IT TO GET HOME	

SENT TO TAD TO THIS POINT

SECOND POINT MAYBE ENTERED OF 996 MB. SONDE WELL AWAY FROM 996. SFC WINDS STARTING TO NORTH

ALL SONDES TRANSMITTED
1 HOUR SONDE
LOST OF CLOSE. TURNED PRETTY STRAIGHTFORWARD
GAINACHE KEPT BEARINGS GOING UNTIL 0402Z → SWITCHED OUT LEG ON 090
JUST EXTENDING OUTBOUND
SINCE WE'RE CLOSE THROUGH LOTS OF PRECIP
COULD HAVE RUN TOP RADAR ON THE WAY HOME,
BUT SAW IT OFF BEFORE THE CORE

Mission Summary

Scientific Crew (43RF)
Lead Project Scientist ZAWISLAK
Radar Scientist EWALAR
Cloud Physics Scientist
Dropwindsonde Scientist ZAWISLAK
Boundary-Layer Scientist
Workstation Scientist
Observers (affiliation)

Mission Briefing: (include sketch of proposed flight track or page #)

PLAN CALLS FOR A BUTTERFLY PATTERN ORIENTED AS FOLLOWS: 090/270, 210/030 330/150
LO LVL AND CLIMB UP TO 20 KFT WHEN WE CAN WEATHER PERMITTING
ALTHOUGH WSRA PREFERS BELOW 15KFT, MAYBE 12 KFT
A LOT OF WEATHER TO THE EAST BTW LOW/SHEAR AND STORM, WHICH MAY REQUIRE DIFFERENT APPROACH STORM IS 999, STILL 50-55 KT WINDS

Mission Synopsis: (include plot of actual flight track)

DID END UP DOING 060°/240° TRACK TO START AS WE HAD TO GO WEST FIRST TO AVOID SEVERE THUNDERSTORMS. THEN JUST CONTINUED THAT PATTERN: 180→360, 300→120. BUT ON LAST EASTBOUND, JUST LIKE TO CUT EAST 090° BC TOO STRONG OF STORMS OR SE POINT. SO STILL GOT RADAR COVERAGE OF EAST, BUT CLOSER TO OUR INBOUND, NOT @ 120.
WSRA DID NOT COLLECT FOR A PERIOD ON 1ST PASS; SINCE WE WENT UP TO 20KM TO GET SOME DEEPER DROPS. OVERALL THOUGH, NOT MUCH PRECIP THAT ON EAST SIDE. GOT A GOOD BAND MIXED OF ICE, BUT NOT GREAT COVERAGE.
SO FOR DIDN'T GET A WHOLE BIG PRECIPITATION WSRA AND UMASS SFMR DID

Evaluation: (did the experiment meet the proposed objectives?)

THERE WAS A TRADE-OFF B/W WSRA NEEDING LOWER ALTITUDE AND US WANTING TO BE HIGH.
SO COMPROMISED W/ HIGH ON 1ST PASS (VERY CLOSE WSRA) THE REST OF PATTERN AT 10 KFT (GOOD FOR WSRA NOT AS DEEP SONDES) → BUT STILL INTERESTING SONDES EVEN IF JUST 3 km
SO 4 SONDES UP HIGH

Problems:(list all problems)

NO REAL PROBLEMS JUST
TOUGH PLANNING GIVEN THE MOVEMENT OF STORM AND HOW BOUNDARY SEVERE WX TO THE EAST, EVEN OVER FLORIDA
SO HAD TO BE MORE CONSERVATIVE
ALSO DIDN'T GET GOOD FIXES, SO HAD TO USE AIRFORCE FIXES AND ADJUST FOR RADAR ANALYSIS

Expendables used in mission.

	Deployed	Good	Bad
GPS sondes :	14 (1 MANUAL)	14	0
AXBTs :	0		
Sonobuoys:			
UAVs			

OVERALL, PSURF FAIRLY CLOSE STILL TO 999, MAYBE 997 NOW
BUT WE ONLY HAVE DOTA TO SUPPORT 50-55 KT SFC WINDS.
GOOD PATTERN, JUST NOT ENOUGH PRECIP NEAR SFC CIRC