Dakota UAS Emergency Procedures

The Dakota UAS has numerous redundant systems to help ensure its safe recovery at the end of every operational sortie. In the event that these systems fail, as a last resort the air vehicle would be sent a Flight Termination System (FTS) command on a separate, redundant data-link. This command cuts power to the engine, places the air vehicle in a nose-high condition and drops the flaps to slow the air vehicle. Shortly thereafter, a parachute deploys to control the decent of the aircraft (estimated at 7 feet/second). Possible hazards in the event of an off-field recovery include two, 12V nickel metal hydride batteries and up to four gallons of fuel (to be carried for the mission pertaining to this COA).

MISSION SPECIFIC FAILURE MODES FOR THE PURPOSES OF THIS COA:

1. Lost Link: As a routine checklist item, a return to base (RTB) point will be uploaded before each flight. The RTB point will lie approximately ½ mile west of the end of closed runway 26 at LGU at an altitude of 400’ AGL. In the case of a lost link, the air vehicle’s flight computer is programmed to loiter at this point and hold altitude until R/C command is established on the separate, redundant R/C link. The vehicle would then be recovered by the external (R/C) pilot.
2. Loss of Control: In the case of a system latch-up or lost navigation capabilities which cause the air vehicle to fail to respond to control inputs from the flight computer, the external pilot will attempt to gain control with the separate, redundant R/C link. If R/C link cannot be established, or the air vehicle leaves the approved flight box (including altitude), or establishes an un-commanded heading in the direction of the airfield, then an FTS command will be sent and the team would commence an off-field recovery. An immediate emergency call on the Unicom frequency would be issued upon the development of a loss of control condition to warn other aircraft operating the vicinity.
3. Mechanical failure: In the case of loss of engine power or structural failure an immediate FTS command will be sent to the aircraft and the team would commence an off-field recovery.