

| ID | Risk Item                      | Effect  | Cause  | Likelihood | Severity | Importance | Action to Minimize Risk   | Owner                              |
|----|--------------------------------|---|--|------------|----------|------------|---|------------------------------------|
| 1  | Flight Test Failure            | Team fails to meet project deliverable  | Poor aircraft design, pilot error, etc.  | 3          | 3        | 9          | Design aircraft and associated tests correctly  | Lead Engineer                      |
| 2  | Wing Spar Failure              | Wing fails, causing catastrophic crash.   | Wing not properly designed to handle payload.  | 1          | 2        | 3          | Increase payload in small increments during testing, watch for wing flex during each test flight. | Entire Team                        |
| 3  | Meeting Project Deadlines      | Project will run behind schedule, or project deliverables are not met   | Poor planning and poor execution   | 3          | 2        | 6          | buffer time between dependent actions, keep all team members aware of work that needs to be done  | Team Lead                          |
| 4  | Motor too small                | Motor does not provide enough power with payload to accelerate plane down runway, causes crash.                                       | Selected motor was too small to fly plane at gross take off weight.  | 1          | 3        | 3          | Slightly oversized motor selected; motor tested for static thrust generation                      | Lead Engineer                      |
| 5  | Plane fails to take off        | Plane cannot reach required takeoff speed   | Plane cannot handle payload  | 2          | 2        | 4          | Increase payload in small increments during testing, do not force marginal takeoffs.              | Pilot                              |
| 6  | Build Time Runs Over           | Delay in meeting project deliverable, flight testing does not run on schedule Loss of flight control surface(s), catastrophic failure | Poor scheduling and poor work habits   | 2          | 2        | 4          | Begin build phase early and maintain positive team morale   | Team Lead                          |
| 7  | Servo disconnects in flight    | Loss of flight control surfaces. catastrophic failure   | Poorly secured wires, poorly anchored  | 1          | 3        | 3          | Properly anchor all servos, properly secure all wires, perform careful pre-flight check.          | Lead Engineer                      |
| 8  | Wings Detach from Plane        | Wings break off plane, catastrophic failure   | Poor connections, connection comes loose, wing loading too great   | 1          | 3        | 3          | Careful preflight test  | Pilot                              |
| 9  | Component Redesign             | Forced project redesign can force the project to run over deadlines   | Controller board was not designed with proper components   | 1          | 3        | 3          | Early examination and re-design efforts.  | Entire Team, Lead Engineer         |
| 10 | Miscellaneous Damages/Theft    | Loss of progress and time   | Negligence   | 1          | 3        | 3          | Ensure all parts are properly stored and secured  | Entire Team                        |
| 11 | Rear Landing Gear Failure      | Loss of ground control (steering), potential cargo / plane damage   | Poor attachment, hole on the runway,   | 2          | 1        | 2          | Ensure landing gear is properly attached to plane, create pre-flight checklist.                   | Lead Engineer, Pilot               |
| 12 | Front Landing Gear Failure     | Nose dive (prop damage), cargo damage, plane structural damage  | Landing gear detaches from plane body  | 1          | 2        | 2          | Re-enforce / analyze the landing gear mounts.   | Lead Engineer<br>Airframe Engineer |
| 13 | Component Testing Failure      | Delay in project deliverable or testing schedule  | Faulty component or poor system design   | 1          | 2        | 2          | Test parts early and properly design all critical systems   | Entire Team                        |
| 14 | Part Lead Time                 | Parts required for assembly delay build progress  | Parts were not ordered far enough in advance   | 2          | 1        | 2          | Order parts at the end of MSDI and make sure all parts are ordered                                | Team Lead<br>Lead Engineer         |
| 15 | Team Member Injury             | Team member can fall behind in work resulting in a progress delay   | Multiple   | 1          | 2        | 2          | Every team member acts in a responsible manner ensure work is done in a timely manner             | Entire Team                        |
| 16 | Critical Data Loss             | Component re-design or re-analysis necessary  | Hard drive failure, Lost flash drive   | 1          | 2        | 2          | All documents are backed up and on EDGE   | Entire Team                        |
| 17 | P11562 Project Failure         | Camera used for testing is not prepared for flight testing  | Improper design to fit into airplane, design is unfinished or unable to function   | 2          | 1        | 2          | Use an alternate camera system for aerial imagery   | Project Lead                       |
| 18 | Battery Performance            | Batteries do not provide specified power or voltage   | Poor manufacturing, improper charging, specifications are wrong Engineering selection and design was poor or improper, batteries suffer degraded performance due to age. | 2          | 1        | 2          | Use an alternate supplier for batteries or use an alternate combination                           | Propulsion Engineer                |
| 19 | Airplane Crashes               | Airframe is irreparably damaged or requires major rebuild.  | Pilot Error  | 2          | 3        | 6          | Come up with detailed go/no-go conditions for flight, select qualified pilot.                     | Lead Engineer, Pilot               |
| 20 | RC Controller Failure          | Airframe crashes  | Miscellaneous electronic failure.  | 1          | 3        | 3          | Perform ground check of radio equipment before flight.  | Pilot                              |
| 21 | UAV Controller Failure         | Controller board needs to be rebuilt/repared  | Component failure, incorrect installation or implementation of controller.   | 2          | 2        | 4          | Use caution while working with existing controller equipment                                      | Entire Team                        |
| 22 | Airframe Crash Damages Payload | Controller board or imaging system are damaged.   | Pilot error, airframe failure.   | 1          | 3        | 3          | Test and qualify airframe before flying with live payload.  | Lead Engineer                      |
| 23 | Software Bugs                  | Delay in controller development.  | Poor existing software, difficulty in creating new software  | 1          | 2        | 2          | Start coding early in project   | Computer Engineer                  |
| 24 | Plane Can't Support Payload    | Not all flight testing goals can be accomplished.   | Plane is poorly designed or underpowered.  | 1          | 3        | 3          | Minimize weight of any new equipment  | Entire Team                        |