| | | | | |
|---|---|---|---|---|
| **Team #** | P20762 | | **Team Name** | TJ-MACK Aquaponics |
| **Date** | 09/03/10 | | **Document Owner** | Caleb Wheelock |
| **Rev #** | 1 | | **Rating Scale** | Lowest Risk - 1-10 - Highest Risk |

**FMEA + Risk Response Plan**

| Priority | Triple Constraint (Schedule, Scope, Budget) | Risk Category (Social, Resource, Technical, Environmental, Safety) | Risk Threat | Effect | Likelihood | Severity | Detection | RPN (L*S*D) | Trigger | Response Plan (Avoid, Transfer, Mitigate, Accept) | Contingency | Owner | Has the Risk Event Occurred? | Was the Contingency Effective? | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | Budget | Resource | Final product is over $400 | Failure to meet critical objective, customer dissatisfaction | 3 | 10 | 5 | **150** | Projections show that necessary materials go over alotted budget | Avoid - Must maintain critical cost constraint | Research cost effective alternatives | Jacky | No | | |
| **2** | Scope | Resource | Unavailable resources in Columbia | Unable to build full farm for demo in Columbia | 5 | 5 | 5 | **125** | Materials not available when ready to build in Columbia | Mitigate - Plan ahead with Alvaro what materials will be available and make adjustments | Make due with available materials to complete the build | Caleb | No | | |
| **3** | Scope | Technical | Language barrier | Difficulty in conveying information to farmers | 10 | 1 | 10 | **100** | Awareness of lack of Spanish skills among group | Accept - Understand that the barrier and plan for translators ahead of time | Work with translators to ensure correct info is transferred | Thomas/Melissa | No | | |
| **4** | Scope | Technical | Plant base does not hold in water | Plants suffer and potentially die | 4 | 5 | 5 | **100** | Leaks noticed in testing of farm | Mitigate - Use past teams info to identify best solutions for sealing the base | Have possible alternatives ready to implement | Kesh | No | | |
| **5** | Scope | Technical | Sensors do not function properly | Fish and plants not monitored and could die | 3 | 8 | 4 | **96** | In testing, sensors malfunction | Mitigate - Utilize past teams data to ensure sensors track appropriately | Review research materials and continue testing | Jacky | No | | |
| **6** | Scope | Social | Columbian stakeholders not satisfied with final product | Poor grades, unable to implement in Columbia | 2 | 9 | 5 | **90** | Meetings with Alvaro indicate behind expectations | Mitigate - Ensure clear deliverables outlined with Alvaro | Provide justification for missing deliverables | Caleb | No | | |
| **7** | Scope | Technical | System does not circulate water fast enough | Fish do not survive | 3 | 8 | 3 | **72** | Fish die in testing | Mitigate - Utilize past teams data to find optimal flow rate | Continue to test flow rates and find optimal | Melissa | No | | |
| **8** | Scope | Environmental | Reliant on more electricity than expected | Customer dissatisfaction | 4 | 6 | 3 | **72** | Prelim designs use more electricity than anticipated | Mitigate - Research alternative energy sources (solar, wind) | Utilize necessary electricity but note opportunities for future teams to improve | Armand | No | | |
| **9** | Scope | Social | Columbian farmers fail to understand how the final product works | Unable to provide informative demo in Columbia | 2 | 5 | 7 | **70** | Overview of instructions with Alvaro indicate confusion | Mitigate - Go through multiple iterations of instrucitons with Alvaro to ensure comprehension | Adapt demo to best guide the farmers | Kesh | No | | |
| **10** | Schedule | Social | Unable to meet with customer regularly | Deliverables are unclear and could affect final product | 4 | 4 | 4 | **64** | Questions left without a response/missed meeting for more than a week | Accept - Understand that the customer has other commitments and adapt schedule to best fit their needs | Re-establish contact ASAP and provide comprehensive review of current progress to bring up to speed | Thomas | No | | |

| | | | | |
|---|---|---|---|---|
| **Team #** | P20762 | | **Team Name** | TJ-MACK Aquaponics |
| **Date** | 09/03/10 | | **Document Owner** | Caleb Wheelock |
| **Rev #** | 1 | | **Rating Scale** | Lowest Risk - 1-10 - Highest Risk |

**FMEA + Risk Response Plan**

| Priority | Triple Constraint (Schedule, Scope, Budget) | Risk Category (Social, Resource, Technical, Environmental, Safety) | Risk Threat | Effect | Likelihood | Severity | Detection | RPN (L*S*D) | Trigger | Response Plan (Avoid, Transfer, Mitigate, Accept) | Contingency | Owner | Has the Risk Event Occurred? | Was the Contingency Effective? | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **11** | Budget | Resource | Materials run over budget | Project could be stopped and must make do with current materials | 3 | 7 | 3 | **63** | Projections show that necessary materials go over alotted budget | Avoid - Must maintain given budget for success. Use BOM and CAD to esnure adequate materials and within budget | Research cost effective alternatives | Jacky | No | | |
| **12** | Scope | Social | Lack of team engagement and motivation | Deadlines missed or poor quality of delvierables | 3 | 5 | 4 | **60** | Team members are unfocused or unprepared for meetings | Mitigate - Enforce group communication and clear objectives for each individual | Team works together to make up missed work and helps struggling team member get back on track | Melissa | No | | |
| **13** | Scope | Safety | Insufficient protection from electricity | Possible electrocution | 1 | 10 | 4 | **40** | Testing and design reveals possible hazards | Avoid - Final dsign must be safe for public use | Plan with rudimentary protections from electricity (ex: electric tape) | Armand | No | | |
| **14** | Scope | Safety | Arichitecture is unstable | Vertical farm becomes a safety hazard | 2 | 9 | 2 | **36** | Weak supports noticed in construction | Mitigate - Plan out design beforehand with BOM and ensure physics support the design | Review past designs, make adjustments and reuse materials where applicable | Kesh | No | | |
| **15** | Scope | Technical | Revisions to project plan required | Time required to make adjustments and get back on track | 5 | 2 | 3 | **30** | Informed of deficiency in plan at a review | Accept - Understand plan can change and make adjustments | Assign work to relevant roles and ensure plan is updated promptly | Caleb | No | | |
| **16** | Scope | Social | Group conflict | Low team morale, deliverables not completed, poor communication | 3 | 5 | 2 | **30** | Discussions within team turn personal or hostile | Mitigate - Ensure all members are able to voice opinion and that discussions stay impersonal | Assign a neutral mediator to help sort out the conflict. Allow time to pass if needed before mediation | Melissa | No | | |
| **17** | Scope | Environmental | Insufficient power | Farm does not produce as well as expected | 3 | 5 | 2 | **30** | Power dependent functions inoperable in testing | Mitigate - Plan out how much power will be required given current functions and ensure that amount can be supplied | Look for ways to increase power and or require less | Armand | No | | |
| **18** | Scope | Safety | Water hazard | Small children could be harmed if not careful | 1 | 10 | 3 | **30** | Preliminary design do not reflect any protection | Avoid - Final dsign must be safe for public use | Devise a temporary barrier to ward off any safety incidents | Melissa | No | | |

| | | | | |
|---|---|---|---|---|
| **Team #** | P20762 | | **Team Name** | TJ-MACK Aquaponics |
| **Date** | 09/03/10 | | **Document Owner** | Caleb Wheelock |
| **Rev #** | 1 | | **Rating Scale** | Lowest Risk - 1-10 - Highest Risk |

**FMEA + Risk Response Plan**

| Priority | Triple Constraint (Schedule, Scope, Budget) | Risk Category (Social, Resource, Technical, Environmental, Safety) | Risk Threat | Effect | Likelihood | Severity | Detection | RPN (L*S*D) | Trigger | Response Plan (Avoid, Transfer, Mitigate, Accept) | Contingency | Owner | Has the Risk Event Occurred? | Was the Contingency Effective? | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **19** | Scope | Social | Lack of transparency with stakeholders | Unsatisfied stakeholders with final product | 2 | 5 | 3 | **30** | Stakeholders indicate confusion with deliverables and progress | Mitigate - Maintain close and frequent communication with stakeholder and update with changes to triple constraint | Schedule meeting to clear up any confusion ASAP | Thomas | No | | |
| **20** | Schedule | Resource | Incomplete phase deliverables | Behind schedule and must make up for it while completing new deliverables | 2 | 6 | 2 | **24** | Unprepared for design review | Mititgate - Prepare a 1 week ahead all deliverables for a review | Ensure that past deliverables are completed ASAP following the review | Caleb | No | | |
| **21** | Schedule | Resource | Failure to meet project completion deadline | Poor grades, unable to showcase at Imagine and demo in Columbia | 1 | 10 | 2 | **20** | Final deadline within 3 weeks and significant workload remains | Avoid - Final product must be completed by end of MSD 2 | Ensure #1 focus is workable prototype within time remaining | Caleb | No | | |
| **22** | Scope | Technical | EDGE not reflective of progress | Stakeholders are ill-informed of actual progress | 3 | 3 | 2 | **18** | Team and/or stakeholders inform us of problem with EDGE | Mitigate - Ensure EDGE is updated after every team meeting | Apply updates ASAP | Armand | No | | |