

P17665 Rotating Dynamometer Risk Assessment

Key	Severity = 1, 3, or 9 where 1 is low severity and 9 is high severity.	This risk is no longer a worry.
	Likelihood = 1, 3, or 9 where 1 is low likelihood and 9 is high likelihood.	This risk is keeping us off track.
	Risk Score = Severity * Likelihood	Still tracking risk.

ID	Category	Owner	Risk	Cause	Effects	Severity	Likelihood	Risk Score	Risk Prevention Strategy	Risk Mitigation Strategy	Risk Death Date
Tec9	Technical/Design	Muhammad	Faulty strain gauge components.	Unavailable supplier, unavailable component	Incorrect or unstable readings, leads to unusable data.	9	3	27	Order extra strain gauges in advance from different manufacturers.	Reorder strain gauge components.	2/14/2017
Tec8	Technical/Design	Brian	Strain gauges have poor adhesion, (heat or shake off).	Too much heat for adhesive, improper preparation of the surface.	Potentially damaged strain gauges, incorrect or unstable readings, leads to unusable data.	3	3	9	Use more effective adhesive, benchmark adhesives. Do proper research on how to install strain gauges.	Reapply strain gauge.	2/14/2017
Tec14	Technical/Design	Muhammad/Joe	Cold solder joints	Poor soldering.	Need to resolder, strain gauges may be damaged.	9	3	27	Once soldered, pull wire and do a continuity test.	Resolder wire or repair solder joint.	2/23/2017
Res5	Resource	Joe	Budget constraint reached.	Planning oversight, spending frivolously or cost of components, incorrect upkeep of BOM.	Inability to deliver finished product.	9	1	9	Keep track of BOM, budget for risk and contingencies.	Try to get budget moved to \$2500. We can not exceed \$2500 as a strict customer requirement.	5/3/2017
Tec1	Technical/Design	Zac/Muhammad	Data does not meet accuracy requirements.	Improper sensor placement, incorrect data processing, packet loss.	Unhappy customer, poor accuracy of results. Engineering requirement not met.	1	9	9	Select sensors that have a proper data collection range, perform proper calibration.	Perform early testing to ensure accurate results are being obtained.	3/13/2017
Tec11	Technical/Design	Brian/Muhammad	Measurement structure interferes with the electronics.	Natural frequency of structure causing resonance and thus a false reading or vibrating something loose.	Need to redesign the structure.	9	1	9	Perform natural frequency analysis.	Select a material that had a natural frequency that is beyond that of what will be created when machining or redesign.	3/13/2017
Tec12	Technical/Design	Muhammad	Runs out of power.	Run too long/battery was not recharged.	Cannot collect data.	3	3	9	Add in an indicator light for low battery, perform power consumption study.	Add bigger battery, find alternative power source.	3/13/2017
Tec23	Technical/Design	Brian	Labview is unable to interpret data based on packaging.	Bluetooth transmission, incorrect research.	Device will not work	9	1	9	Perform research correctly beforehand.	Create wrapper program to repackage data.	3/9/2017
Tec10	Technical/Design	Muhammad	Microprocessor fails or is damaged.	Device was dropped or mishandled in general.	Dynamometer will not perform function.	9	3	27	Have another microcontroller on hand.	Use microcontroller that we have in stock or reorder if necessary.	3/10/2017
Tec19	Technical/Design	Muhammad	Signal is too noisy.	General noise, bad filtering.	Incorrect results, reduced accuracy.	9	3	27	Use software based filtering.	Use software based filtering.	3/10/2017
Tec7	Technical/Design	Brian	Loose wire connections inside housing.	Vibration caused during machining or mistake made during assembly.	Incorrect or unstable readings, electronics not working.	3	3	9	Rely more on solder connections on a prototype board in design, use clipping connectors if needed.	Find loose wire connection and resolder or connect.	3/13/2017
Tec4	Technical/Design	Joe/Zac	Design is not completed by end of MSD.	Inefficient use of time, bad luck, poor planning.	Unhappy customer, unhappy team, poor grades.	9	3	27	Proper planning, proper testing, staying on schedule.	Utilize guide to keep us on track and plan for extra time in case things go wrong.	4/19/2017
Res8	Resource	Team	Overworking team members.	Setting our team values and norms at too high of a bar to reach, uneven distribution of workload.	Unproductive team. Frustration and anger among team members.	9	3	27	Make a schedule and stick to it, make teammates share projects so everyone can still work on what they want to work on, communicate.	Penalize teammates that do not do enough, do too much or do other teammate's jobs.	5/3/2017
Saf1	Safety	Eibert	Structure or component flies off at high RPM experiencing significant damage.	Structure not secured appropriately in the machine. Improper mounting or insufficient safety measures.	Physical injury due to weight, needing to repair the device, or even death.	9	3	27	Perform testing at low RPMs first to check for instability, then move onto higher RPMs in steps. Use safety shield.	Redesign product ASAP. May hit budget issues. Reassess the way we are attaching device.	5/3/2017
Res1	Resource	Team	Failure of bridgeport milling machine.	Extreme damage to the head or frame of the machine due to factors outside of our control.	Inability to perform tests, verify project.	9	1	9	Make designs flexible to other machines.	Design project for another milling machine.	5/3/2017
Res2	Resource	Team	Team damages bridgeport milling machine.	Team does not take proper precautionary measures when performing testing.	Inability to perform tests or verify project, we may be banned from the shop, we may face financial damages.	9	1	9	Have test plan strategies designed for safety, and protection of machines and all personnel involved.	Have plan in place in case machine is damaged.	5/3/2017
Res3	Resource	Joe	Loss of team member.	Unforeseen circumstance removing them from the class.	Need to distribute the load across all teammates/see about getting another team member.	9	1	9	Make sure everyone is in good health, is not struggling. Team members should speak up if they need help.	Spread work out among remaining team members.	5/3/2017
Saf2	Safety	Zac	Cutting tool bit failure causes shrapnel to fly.	High tool loads, worn out tool, faulty tool, or improper machining.	Need to replace tool, replace/repair any damaged components.	9	1	9	Have a safety guide or checklist before operation, wear PPE.	Use machine shop safety incident procedures.	5/3/2017
Tec3	Technical/Design	Eibert	Instruction manual is not useful to the customer.	Poor detail, too much detail, poor layout, incomplete.	Improper set-up or usage of device, inability to use device.	9	1	9	Go through the setup with people outside our group with them following the manual. Keep documentation on track.	Have guide and customer proof-read before handoff.	5/3/2017
Saf3	Safety	Eibert	Tool not inserted properly into toolholder.	Careless when installing the tool into the structure.	Improper readings, damaged tool, housing damage.	3	1	3	Detailed setup instructions, awareness among team on how to install tool.	Order new tool, repair device if any damage.	5/3/2017
Tec13	Technical/Design	Eibert	Shank of tool is broken off inside the toolholder.	High tool loads, worn tool, faulty tool, incorrect installation of tool.	Need to swap tool and check over the structure.	3	1	3	Use a collet based tool holder so that the tool is easily removable.	Swap the tool.	5/3/2017