MSD Water Table Project Risk Assessment Overview

ID	Risk Item	Effect	Cause	Likelihood	Severity	Importance	Action to Minimize Risk	Owner
	Describe the risk briefly	*What is the effect on any or all of the project deliverables if the cause actually happens?*	*What are the possible cause(s) of this risk?*			*L*S*	*What action(s) will you take (and by when) to prevent, reduce the impact of, or transfer the risk of this occurring?*	*Who is responsible for following through on mitigation?*
1	Water Table does not provide straight flow	Flow visualization fails to demonstrate intended educational concepts	Flow straighteners insufficient, incorrect table geometry, incorrect analysis	2	3	6	Conduct hand calcs and CFD models, build early to allow for testing/iteration, research and base design off of previous successful benchmarks by 2/3/12	Tim
2	Water table leaks	Water spills, posing clean up issue and safety hazard, makes impractical for lab use	Failure to seal system, test specimen apparatus leaks, valves/ piping/ pump/tank leak	2	3	6	Research/seek best sealing methods, test and iterate prior to building, test plumbing before assembly	John/Tim
3	Cart breaks from loads	The cart is not enough of a robust design. The cart has a dynamic impact on something and breaks, water leaks	Improper analysis of forces on walls of water table tank and legs of table, not planned for odd cases or dynamic impacts	2	3	6	Verify calculations through analytical techniques and testing, plan for high static factors of safety, test pieces where applicable prior to building	Andrew/Tim
4	Customer needs/priorities change	Customer wants needs and specs to change. System needs to be possibly redesigned.	Customers decide they want more out of the design outside of the scope of the project or originally scoped.	3	2	6	Used derived scope of project and settled on customer needs and specifications as “shield”. Build robust detailed specification to alleviate ambiguity before MSD II phase.	John
5	Poor planning	Deadlines are not met. Project completion is late.	Improper scheduling of project deadlines, parts hard to machine / assemble, parts delivered slow, failure to consider lead times	2	2	4	Schedule deadlines with “cushion” and consult with faculty advisor regularly. Order long lead parts early.	John

6	Project goes over the budget	Not all needed parts bought, incomplete design, less optimal design	Improper planning, unexpected prices/constraints, additional parts needed	2	2	4	Plan properly, receive quotes during MSD I, build / manufacture parts in house, request additional funds if needed in MSD I DDR	Andrew
7	Test fixture does not hold test piece	No way to demonstrate interesting flows, objective of project fails	Weak design/construction, no backup plans if test fixture fails, improper analysis during MSD I	1	3	3	Peer review of design, research alternative holding methods to provide if primary method fails, build safety factor into analytical calculations	Andrew
8	Water table declared unsafe for use	Electrical hazards, moving parts unsafe for interaction, thus, device would be declared not useable for use.	Improper insulation of wire, improper grounding of components, not tested before MSD II for safety, safety official not consulted	1	3	3	Insulate all components, proper safety labels where appropriate procedures written, training of users with proper documentation, discuss design with safety officials, develop plan if hazard were to occur.	Danny
9	Electrolysis fails to demonstrate flow	Lose flow visualization and have to resort to different methods	Bubbles do not rise, not consistent with flow, not enough bubbles, bubbles do not form, circuit does not work, improper experimental analysis during MSD I	2	1	2	Develop concurrent methods, conduct testing during MSD I and calculations/experimentation by 1/15/12 to determine if feasible	Danny
10	Flow speed specifications not achieved (but flow achieved)	Don't meet engineering specs, but design still works. User cannot get the desired Reynolds number	Failure to design pumping/drain system appropriately by not performing proper pre-analysis to MSD II phase	2	1	2	Pump calculations to justify proper flows by 1/15/12, CFD model feasibility analysis, flow rate calculations, preliminary pump testing beginning MSD II phase	Tim
11	Inconsistent team priorities	Team deadlines are not met. Conflict with team members. Project does not interface well.	Poor leadership and opposing team opinions. Team members are unwilling to compromise.	1	2	2	Establish team values and norms thoroughly. Facilitate team issues early. Make sure everyone's opinion is heard and considered. Consistently check project progress.	John

Likelihood scale	Severity scale
1 - This cause is unlikely to happen	1 - The impact on the project is very minor. We will still meet deliverables on time and within budget, but it will cause extra work
2 - This cause could conceivably happen	2 - The impact on the project is noticeable. We will deliver reduced functionality, go over budget, or fail to meet some of our Engineering Specifications.
3 - This cause is very likely to happen	3 - The impact on the project is severe. We will not be able to deliver, or what we deliver will not meet the customer's needs.

"Importance Score" (Likelihood x Severity) – use this to guide your preference for a risk management strategy	
Prevent	Action will be taken to prevent the cause(s) from occurring in the first place.
Reduce	Action will be taken to reduce the likelihood of the cause and/or the severity of the effect on the project, should the cause occur
Transfer	Action will be taken to transfer the risk to something else. Insurance is an example of this. You purchase an insurance policy that contractually binds an insurance company to pay for your loss in the event of accident. This transfers the financial consequences of the accident to someone else. Your car is still a wreck, of course.
Accept	Low importance risks may not justify any action at all. If they happen, you simply accept the consequences.