FMEA

Process/Product Name: Submarine
Prepared By: Noah Schenck
Responsible: MECH 202 Team 9
FMEA Date (Orig.): 23-Apr (Rev.):

Process Step/Input	Potential Failure Mode	Potential Failure Effects	SEVERITY (1 - 10)	Potential Causes	OCCURRENCE (1 - 10)	Current Controls	DETECTION (1 - 10)	RPN	Action Recommended	Resp.	Actions Taken	SEVERITY (1 - 10)	OCCURRENCE (1 - 10)	DETECTION (1 - 10)	RPN
What is the process step, change or feature under investigation?	In what ways could the step, change or feature go wrong?	What is the impact on the customer if this failure is not prevented or corrected?		What causes the step, change or feature to go wrong? (how could it occur?)		What controls exist that either prevent or detect the failure?			What are the recommended actions for reducing the occurrence of the cause or improving detection?	Who is responsible for making sure the actions are completed?	What actions were completed (and when) with respect to the RPN?				
Button press to activate device	*Submarine fails to activate*	*Complete failure to deliver submarine prototype for*	*8*	*Dead battery*	*7*	*Voltage check to ensure battery is supplying power*	*1*	*56*	*Replace battery day before competition*	*All team members*	*Checked battery voltage with multimeter before every run*	*8*	*1*	*5*	*40*
			8	*Wires not connected/damaged*	*6*	*Double checking all wire connections before competition*	*7*	*336*	*Replace wires day before competition*	*All team members*	*Shrink wrapped wires and checked before every run*	*8*	*2*	*6*	*96*
			10	*Water damage to electronics*	*5*	*Visual check of electronic components*	*2*	*100*	*Check electronics day before necessary operation*	*All team members*	*Rechecked rubber seal on electronics pod and added oil after every open*	*10*	*2*	*2*	*40*
Traveling across the pool	*DC Motor fails to activate*	*Failure to deliver on the horizontal movement*	*8*	*Wires not connected/damaged*	*6*	*Double checking all wire connections before competition*	*5*	*240*	*Replace wires day before competition*	*All team members*	*Shrink wrapped wires and checked before every run*	*8*	*2*	*5*	*80*
			10	*Water damage to electronics*	*5*	*Visual check of electronic components*	*7*	*350*	*Check electronics day before necessary operation*	*All team members*	*Rechecked rubber seal on electronics pod and added oil after every open*	*10*	*2*	*6*	*120*
	Hull lets in water		*8*	*Not properly waterproofed causing it to sink and drag on bottom*	*8*	*Conduct waterproofing test*	*2*	*128*	*Replace waterproof seal day before competition*	*All team members*	*Added rubber seal and oil to seal and tested to ensure its watertight*	*6*	*4*	*2*	*48*
Diving into the pool	*Servo Motor fails to activate*	*Failure to deliver on diving criteria*	*8*	*Wires not connected/damaged*	*6*	*Double checking all wire connections before competition*	*7*	*336*	*Replace wires day before competition*	*All team members*	*Shrink wrapped wires and checked before every run*	*8*	*2*	*6*	*96*
			8	*Water damage to electronics*	*5*	*Visual check of electronic components*	*2*	*80*	*Check electronics day before necessary operation*	*All team members*	*Rechecked rubber seal on electronics pod and added oil after every open*	*10*	*2*	*6*	*120*
	Arms fail to raise the hull halves		*8*	*Malfunction in the arm connections*	*5*	*Visual check of arm connections*	*3*	*120*	*Check arm connections before placing into pool*	*All team members*	*Checked arm movement before every run, lubricate joints*	*8*	*3*	*2*	*48*
			8	*Material failure resulting in arms snapping*	*6*	*Ensure strength of all arm connections*	*10*	*480*	*Replace arm connections day before competition*	*All team members*	*Arms thickened and extras 3D printed*	*8*	*3*	*10*	*240*