

Part	Function or Requirement	Potential Failure Modes	Potential Causes of Failure	Occurrence	End Effects on Product, User, Other Systems	Severity	Detection	RPN	Actions Recommended to Reduce RPN	Responsibility
Wind Turbine (Mechanical)	Generate power through wind	Fails to generate power to battery	Blades bend	1	Stress at bolt holes, blades strike stand	2	1	2	Only use in approved wind speeds	Franklin
			Generator gearhead grinding	1	Inefficiencies, motor generates heat	2	2	4	Purchase from reputable vendor	
			Unbalanced blades	1	Instability of turbine	2	1	2	Check for dents	
			Hub Breaks	1	Potential injury	3	1	3	Only use in approved wind speeds	
Wind Turbine (Electrical)	Generates power through wind	Fails to generate power to battery	Generator breaks	1	No power generated	3	3	9	Purchase from reputable vendor	Franklin
Mounting Stand	Provide Wind Turbine access to higher wind speeds through an easy assembly	Wind speed too slow to start turbine	Wind speed too low to start turbine	2	Unable to begin battery charge	3	1	6	Perform analysis to ensure necessary wind speeds can be achieved at stand height	Franklin
		Turbine unable to charge battery in 24 hrs	Average wind speed too low	2	Unable to fully charge battery	2	2	8		
	Protect Users/bystanders from harm	Bystander struck by blades	Stand not high enough	1	Serious damage to humans	3	1	3	Ensure stand height meets regulations	Bradley
		Stand falls and injures bystander	Stand not properly secured	1	Serious damage to users/ RIT property	3	2	6	FEA analysis	
Battery	Provides reliable and safe power through a Lead Acid battery	Fails to provide reliable/safe power	Leaks	1	Potential to injure users	3	1	3	Ensure battery is in enclosure and properly handled	Justin
			Damaged battery	1	Battery does not provide reliable power	3	2	6	Ensure battery handled properly and circuitry is protected	
			Discharge too large	1	Battery lifetime affected	3	1	3		
			Not fully charged	2	Batter will not last as long	1	2	4	LED indicators	
Enclosure	Protect electrical components from weather	Fails to Protect Components	Leaks	1	Electronic components are damaged and cease to work	3	1	3	Research for material selection, environmental testing	Phil
DAQ	Report status of battery charge	Fails to indicate charge status of battery	Insufficient voltage	2	User not aware of status	1	1	2	Perform testing to ensure proper voltage being transferred	Jargalan, Zheng
			Microcontroller damaged	1		3	2	6		