Project: P16315 Owner : Luke Kranz 11/15/2015

Revision #: 5

rqmt. #	Importance	Source	Function	Engr. Requirement (metric)	Unit of Measure	Marginal Value	Ideal Value	Comments/Status	Test (how are you going to verify satisfaction)	Functional Decomposition Mapping
S1	9	CR1, CR12	Strain Measurement	Strain Gauge Measureable /Calibrated Range	%Displacement	3	5		Test for measurement limitations, Calibrate before test and measure after test	Measure Strain, Mount Proper Gauges
S2	9	CR1, CR8, CR12		Strain Gauge Adhesion/Lamination Life Cycle	hours	20	60		Test 20 hours or until failure.	Measure Strain
S3	9	CR1, CR6, CR12		Strain Gauge Physical Size	mm^2	100	16		Product specifications	Measure Strain
S4	9	CR1, CR12		Strain Gauge Waterproofing (NEMA IP67)	IP Code	IP68	IP68+	See NEMA ratings.	Test 20 hours or until failure.	Measure Strain, Waterproof Gauges
S5	9	CR2, CR3	Telemetry System	Telemetry SystemTransmission Frequency Range	GHz	-	0.1-100		Product specifications	Transmit Data
S6	9	CR2, CR3, CR8		Telemetry Battery Power System Life Cycle	hours	8	12		Test until failure.	Power Devices
S7	3	CR2, CR3		Telemetry Transmission Strength/Range	m	10	100		Product specifications.	Transmit Data
S8	3	CR2, CR3		Telemetry Data Collection Rate	Hz	100	150		Product specifications.	Receive Data, Process Data
S9	1	CR15	Aggregate System Qualities	Total System Development Cost	$usd	5000	<5000		List costs.	Measure Strain, Find Proper Arrangement
S10	1	CR8		Total Transmission System Weight	kg	2.27	<1.5	Subject to change.	Measure combined weight.	Measure Strain
S11	9	CR8, CR12		Well Secured Wires	hours	8	12		Test 20 hours or until failure.	Wire Gauges
S12	9	CR8, CR12	Telemetry System	Transmitter Case Waterproofing	hours	1	>1	Submerged at depth of 1m.	Case Waterproofing Test Plan.	Transmit Data
S13	3	CR7, CR10, CR12	Aggregate System Qualities	Ease of use/Installation Time	minutes	15	20	Minutes required for full installation.	Time installation from raw components.	Measure Strain, Transmit Data, Receive Data
S14	9	CR9, CR10, CR12		CSV Output File(s) Creation	Yes/No	-	Yes	Under 5MB, finalized at test end.	Output file to PC.	Process Data
S15	3	CR2, CR12	Telemetry System	Transmitter Angular Acceleration Tolerance	g's	0.69	5		Product specifications.	Transmit Data

NEMA Ratings: http://www.dsmt.com/resources/ip-rating-chart/

Importance: Sample scale (9=must have, 3=nice to have, 1=preference only).