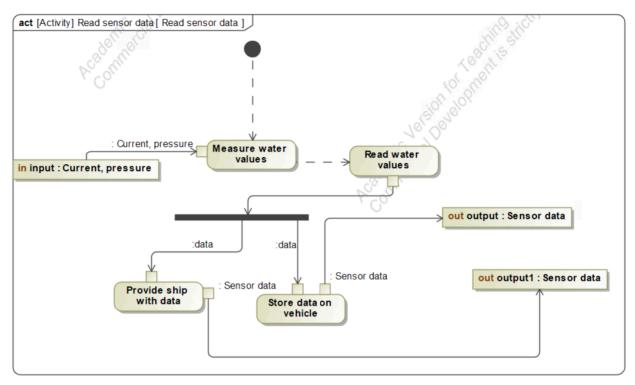
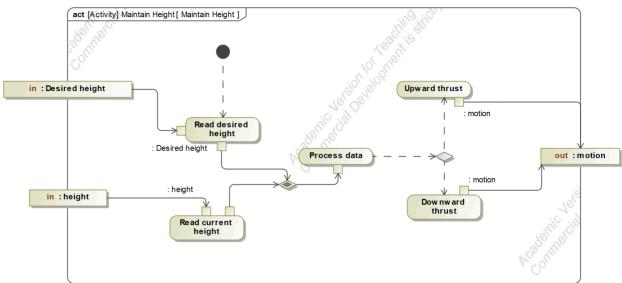
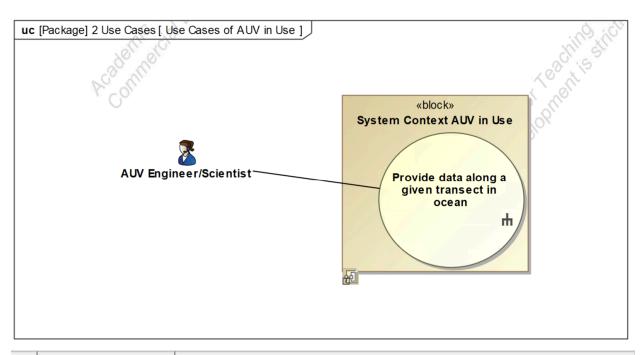


Legend	⊡	□· 1 Stakeholder Needs												
✓ Refine		■ SHREQ1 Depth	■ SHREQ2 Propulsion	■ SHREQ3 Location	☐ SHREQ4 Communication	☐ SHREQ5 Recovery	☐ SHREQ6 Data	☐ SHREQ7 Battery	☐ SHREQ8 Height	☐ SHREQ25 Trajectory ····	F SHREQ26 Altitude	■ SHREQ27 Motion		
White Box 2 Functional Analysis Communicate data Downward thrust Hollow path Maintain Height Hostive thrust Process data Reach set height Read current height Read current location		1	5	2	2	3	4		3	1	3	7		
🗎 🛅 2 Functional Analysis 📿 💍		1	5	2	2	3	4		3	1	3	7		
ு 🔁 Communicate data 🙎 义	3				7	7	7							
🔁 Downward thrust 📑 🥳	1											7		
" 🔁 Follow path 😽 🔁	3		7							7		7		
🔁 Maintain Height 💢 💍	3		7								7	7		
🔂 No thrust	2		7									7		
·· 🔁 Positive thrust	12		7									7		
🔁 Process data	ďΩ				7									
🔁 Reach set height 🙎	2								7			7		
🔁 Read current height 🙎	4-	ì		7			7		7		7			
🔁 Read current location 💝	3	3		7		7	7							
🔁 Read desired height	2								7		7			
🔁 Read desired path	ď.	0												
·· 🔁 Read sonar data	2	7	5				7							
🔁 Upward thrust	3	()	7			7						7		
🖽 🛅 3 Logical Architecture	Ĭ	n	3											
🗄 🛅 Conceptual Subsystem Communicati		4	Ó											









#	Δ		Text														
1	R 1 Gr	ound Fault Warnin	The AUV shal	l warn engineers of	f ground faults t	hrough co	mmı	unica	tion	syste	m wh	en p	ower	ed or	າ		
2	R 2 Ba	ttery Indicator	The AUV shall have a battery charge indicator light that alerts engineers of current charge														
3	R 3 Ob	ject detection	The AUV shall implement object detection to avoid overhangs														
Id		FMEA Initiating Cause		Sequence Of Event	Hazardous Situation	Harm	S	P1	P2	Р	D	С	PU	⊽ Ris	Use Related		
R-3	F F-2 F2	AUV stuck under overhang	C Physical damage	Pre-mapping se missed seafloor feature	AUV cannot ascend	AUV (H) unrecov erable	4	2	5	10.0	2	5	3	1200. 0	Object a detecti on		
R-1	€ F-1 F1	F-1 F1 AUV short circuits		AUV improperly grounded	© Current flowing improperly	Electroc ution, damag H ed compon	3	2	2	4.0	3	3	5	540.0	Ground R Fault Warning s		
R-2	€ F-1 F1	AUV out of battery	B Status Unknown	&UV improperly charged	Difficult recovery	Possible (4) damag e to A	2	4	1	4.0	1	1	5	40.0	2 Battery Indicato		
Ox D	RPN	Hazard Analysis Reference	(1) Hazar	Requires Hazard Recommended Action Analysis							Mitigation						
8.0	24.0	R-1 AUV R short circuits	☐ false	electrica	proper prod I system is iing			en	sur	e	F			Wa	d rning:		
5.0	20.0	R-3 AUV stuck under overha	☐ false		Thorough mapping prior to dives; object avoidance protocals on AUV								3 Object detection				

#	ld	△ Name	Classification	Item	Failure Mode	Local Effect Of Failure	Final Effect Of Failure	SEV	Cause Of Failure	ooç	Prevention Control	Detection Control	DET
1	F-1	⊕ F1	electrical	& AUV	Loss of Communcations	Unknown AUV status	Difficult recovery process	3	Loss of power	2	© Clearly defined SOPs	Battery life indicators	4
2	F-2	€ F2	mechanical	& AUV	⊕ AUV Stuck	AUV damage	(I) Loss of AUV	4	Hit external object	1	⊗ Obstacle ayoldance	Motor voltage draw values	5

