



UNIVERSITY
OF WOLLONGONG
AUSTRALIA

Risk Assessment RSK2600460

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Assessment Details

Developed By

Date Entered:2/07/2026Entered By:Jonathan Walsh

Date Last Updated:2/07/2026Last Updated By:

Next Review Date:Status:Awaiting ApprovalStatus Date:02/07/2026 07:51 PM

Responsible Business Units

Faculty/PortfolioDeputy Vice-Chancellor (Research and Innovation)Division

School/Unit

Work Activity

Detailed Description:

The project involves the design, assembly, programming, and testing of a prototype sonobuoy intended for underwater acoustic monitoring. Activities include electronics assembly, soldering, 3D printing and fabrication of waterproof enclosures, laboratory-based electrical testing, controlled waterproof and buoyancy validation, battery integration, and supervised ocean deployment.

Risk Assessment Type

☒ General☐ Hazardous Substances☐ Psychosocial

☐ Office☐ Maintenance☒ Research

☐ Teaching☐ Field Work☐ Manual Handling

☐ BioSafety☐ Travel☐ Radiation

☐ Check box if this Risk Assessment is Confidential

Assessment Location

Location Type:

☐ Off Campus☒ On Campus

Specific Location:Biomedical engineering computer lab

Site:Wollongong Campus - 8 - Mechanical Engineering

Room:G22



Development Team

Assessment Completed By: *Jonathan Walsh

Approver

Approver: *Son Lam Phung

Additional Approver: *Faisel Tubbal

Associated Documents

Drag documents and/or photos from your computer and drop them here to upload them.

File Name	Description	Privileged and Confidential
There are currently no Documents uploaded		

Assessment of Hazards and Risk Control 1

Assessment of Hazards and Risk Control

Category:Electricity (contact)

☒ Display on Risk Register

Description of Risk/Hazard:

Assembly and bench testing of low-voltage electronic circuitry for the MESH sonobuoy within UOW laboratories. Electrical fault resulting in short circuit, component overheating or minor electrical injury.

Initial Risk Rating

Initial Risk Rating

	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Low	Low	Medium	High	High
Unlikely	Low	Low	Medium	Medium	Medium
Rare	Low	Low	Low	Medium	Medium

How bad could it have been?Moderate – Minor medical treatment (e.g. GP or outpatient to hospital)

How likely could it occur?Unlikely – The event is unlikely to occur, however it is possible

Initial Risk Rating:Medium

Control



Control

Press the Add Control button to add a new Control to this Risk/Hazard.

Residual Risk Rating

This is where you enter what your risk rating will be after you've entered your controls.

Residual Risk Rating

		Consequence				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Moderate – Minor medical treatment (e.g. GP or outpatient to hospital)

How likely could it occur?

Rare – The occurrence of the event is remote and improbable

Residual Risk Rating:

Low

Control 1

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Elimination

Description of Action or Control:

Eliminate mains-powered testing by designing the prototype to operate entirely from 5 V DC supplies.

Control 2

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Substitution

Description of Action or Control:

Use regulated laboratory power supplies instead of higher-energy power sources.



Control 3

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Isolation

Description of Action or Control:

Conduct testing within designated electronics laboratories with restricted access during energised testing.

Control 4

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Engineering

Description of Action or Control:

Insulated enclosures, fuse protection, Battery Management System (BMS), regulated power supplies, protected wiring, pre-energisation inspection.

Control 5

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Administration, training and instruction

Description of Action or Control:

Follow UOW laboratory procedures, supervision by laboratory staff, electrical inspection checklist before testing.

Control 6

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Personal Protective Equipment

Description of Action or Control:

Safety glasses and enclosed footwear.

Assessment of Hazards and Risk Control 2

Assessment of Hazards and Risk Control

Category:

Plant & Equipment mobile and fixed (contact)

☒ Display on Risk Register

Description of Risk/Hazard:

Assembly and soldering of printed circuit boards and electrical components. Burns from soldering equipment, exposure to solder fumes, eye injury.



Initial Risk Rating

Initial Risk Rating

		Consequence				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Minor – First aid treatment

How likely could it occur?

Possible – The event might occur, but occasionally

Initial Risk Rating:

Low

Control

Control

Press the Add Control button to add a new Control to this Risk/Hazard.

Residual Risk Rating

This is where you enter what your risk rating will be after you've entered your controls.

Residual Risk Rating

		Consequence				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Minor – First aid treatment

How likely could it occur?

Rare – The occurrence of the event is remote and improbable

Residual Risk Rating:

Low



Control 1

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Elimination

Description of Action or Control:

Purchase pre-manufactured modules where practical to minimise soldering.

Control 2

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Substitution

Description of Action or Control:

Use lead-free solder where appropriate.

Control 3

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Isolation

Description of Action or Control:

Perform soldering only in designated electronics workstations.

Control 4

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Engineering

Description of Action or Control:

Solder fume extraction system, heat-resistant soldering stations.



Control 5

Action Details

Control Classification:

☐ Current Control ☐ Proposed Control ☒ Display on Risk Register

Control Type

Administration, training and instruction

Description of Action or Control:

Laboratory inductions, supervision, safe operating procedures, housekeeping.

Control 6

Action Details

Control Classification:

☐ Current Control ☐ Proposed Control ☒ Display on Risk Register

Control Type

Personal Protective Equipment

Description of Action or Control:

Safety glasses, enclosed footwear.

Assessment of Hazards and Risk Control 3

Assessment of Hazards and Risk Control

Category:

Plant & Equipment mobile and fixed (contact) ☒ Display on Risk Register

Description of Risk/Hazard:

Manufacture of waterproof enclosure components using Makerspace fabrication equipment. Burns, cuts or injury from fabrication equipment.

Initial Risk Rating

Initial Risk Rating

		Consequence				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Minor – First aid treatment

How likely could it occur?

Possible – The event might occur, but occasionally

Initial Risk Rating:

Low



Control

Control

Press the Add Control button to add a new Control to this Risk/Hazard.

Residual Risk Rating

This is where you enter what your risk rating will be after you've entered your controls.

Residual Risk Rating

	Consequence					
	Insignificant	Minor	Moderate	Major	Severe	
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Minor – First aid treatment

How likely could it occur?

Rare – The occurrence of the event is remote and improbable

Residual Risk Rating:

Low

Control 1

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Elimination

Description of Action or Control:

Outsource manufacture where practical to eliminate machinery use.

Control 2

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Substitution

Description of Action or Control:

Use lower-risk fabrication methods where suitable.



Control 3

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Isolation

Description of Action or Control:

Restrict access to operating equipment.

Control 4

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Engineering

Description of Action or Control:

Machine guards, emergency stop systems, enclosed printers.

Control 5

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Administration, training and instruction

Description of Action or Control:

Makerspace inductions, authorised operator requirements, SOP compliance.

Control 6

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Personal Protective Equipment

Description of Action or Control:

Safety glasses, enclosed footwear.



Assessment of Hazards and Risk Control 4

Assessment of Hazards and Risk Control

Category:

Electricity (contact)

☒ Display on Risk Register

Description of Risk/Hazard:

Testing enclosure waterproofness and buoyancy before field deployment. Water ingress causing electrical failure, electrocution, or damaged equipment.

Initial Risk Rating

Initial Risk Rating

	Consequence					
	Insignificant	Minor	Moderate	Major	Severe	
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Moderate – Minor medical treatment (e.g. GP or outpatient to hospital)

How likely could it occur?

Possible – The event might occur, but occasionally

Initial Risk Rating:

Medium

Control

Control

Press the Add Control button to add a new Control to this Risk/Hazard.

Residual Risk Rating

This is where you enter what your risk rating will be after you've entered your controls.

Residual Risk Rating

	Consequence					
	Insignificant	Minor	Moderate	Major	Severe	
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium



How bad could it have been?

Minor – First aid treatment

How likely could it occur?

Unlikely – The event is unlikely to occur, however it is possible

Residual Risk Rating:

Low

Control 1

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Elimination

Description of Action or Control:

Laboratory waterproof testing before any field deployment.

Control 2

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Substitution

Description of Action or Control:

Test initially using shallow controlled water tanks instead of open water.

Control 3

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Isolation

Description of Action or Control:

Perform testing in controlled environments separated from public access.

Control 4

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Engineering

Description of Action or Control:

Waterproof enclosure design, O-ring seals, pressure testing, buoyancy verification.



Control 5

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Administration, training and instruction

Description of Action or Control:

Inspection checklist before every deployment, staged testing procedure.

Control 6

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Personal Protective Equipment

Description of Action or Control:

Safety footwear where appropriate.

Assessment of Hazards and Risk Control 5

Assessment of Hazards and Risk Control

Category:

Work in or near water

☒ Display on Risk Register

Description of Risk/Hazard:

Deployment and retrieval of the sonobuoy during field trials. Drowning, vessel incidents, slips, trips, falls or injury during deployment.

Initial Risk Rating

Initial Risk Rating

		Consequence				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Major – Extensive medical treatment (hospital or absence from work > 7 days)

How likely could it occur?

Possible – The event might occur, but occasionally

Initial Risk Rating:

High



Control

Control

Press the Add Control button to add a new Control to this Risk/Hazard.

Residual Risk Rating

This is where you enter what your risk rating will be after you've entered your controls.

Residual Risk Rating

		Consequence				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Major – Extensive medical treatment (hospital or absence from work >7 days)

How likely could it occur?

Rare – The occurrence of the event is remote and improbable

Residual Risk Rating:

Medium

Control 1

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Elimination

Description of Action or Control:

Researcher does not participate in vessel deployment unless specifically authorised; deployment performed by qualified NCSLSC personnel.



Control 2

Action Details		
Control Classification:	☐ Current Control ☐ Proposed Control	☒ Display on Risk Register
Control Type	Substitution	
Description of Action or Control:	Use harbour and pool testing before progressing to open-water deployment.	

Control 3

Action Details		
Control Classification:	☐ Current Control ☐ Proposed Control	☒ Display on Risk Register
Control Type	Isolation	
Description of Action or Control:	Researcher remains shore-based during vessel operations where possible.	

Control 4

Action Details		
Control Classification:	☐ Current Control ☐ Proposed Control	☒ Display on Risk Register
Control Type	Engineering	
Description of Action or Control:	Approved rescue vessel, marine communication equipment, approved deployment hardware.	

Control 5

Action Details		
Control Classification:	☐ Current Control ☐ Proposed Control	☒ Display on Risk Register
Control Type	Administration, training and instruction	
Description of Action or Control:	NCSLSC operational procedures, qualified operators, pre-deployment briefing, emergency response procedures.	



Control 6

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Personal Protective Equipment

Description of Action or Control:

Personal flotation device (when required), sun protection, appropriate footwear.

Assessment of Hazards and Risk Control 6

Assessment of Hazards and Risk Control

Category:

Work in or near water

☒ Display on Risk Register

Description of Risk/Hazard:

Testing under operational coastal conditions. Adverse weather or sea state creating unsafe operating conditions.

Initial Risk Rating

Initial Risk Rating

	Consequence					
	Insignificant	Minor	Moderate	Major	Severe	
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Major – Extensive medical treatment (hospital or absence from work >7 days)

How likely could it occur?

Possible – The event might occur, but occasionally

Initial Risk Rating:

High

Control

Control

Press the Add Control button to add a new Control to this Risk/Hazard.

Residual Risk Rating

This is where you enter what your risk rating will be after you've entered your controls.



Residual Risk Rating

		Consequence				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Major – Extensive medical treatment (hospital or absence from work >7 days)

How likely could it occur?

Rare – The occurrence of the event is remote and improbable

Residual Risk Rating:

Medium

Control 1

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Elimination

Description of Action or Control:

Cancel field testing when environmental conditions are unsuitable.

Control 2

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Substitution

Description of Action or Control:

Conduct testing in sheltered waters where possible.

Control 3

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Isolation

Description of Action or Control:

Restrict field activities to approved operational areas.



Control 4

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Engineering

Description of Action or Control:

Marine weather forecasting systems and communication equipment.

Control 5

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Administration, training and instruction

Description of Action or Control:

Surf Risk Rating on SLS operations app, weather assessment, operational approval from NCSLSC, stop-work authority.

Control 6

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Personal Protective Equipment

Description of Action or Control:

Personal flotation device (where applicable), sun protection.

Assessment of Hazards and Risk Control 7

Assessment of Hazards and Risk Control

Category:

Fire/Explosion

☒ Display on Risk Register

Description of Risk/Hazard:

Use and charging of lithium-ion batteries powering the prototype. Battery overheating, fire or thermal runaway.

Initial Risk Rating

Initial Risk Rating

Consequence					
	Insignificant	Minor	Moderate	Major	Severe



Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Major – Extensive medical treatment (hospital or absence from work > 7 days)

How likely could it occur?

Unlikely – The event is unlikely to occur, however it is possible

Initial Risk Rating:

Medium

Control

Control

Press the Add Control button to add a new Control to this Risk/Hazard.

Residual Risk Rating

This is where you enter what your risk rating will be after you've entered your controls.

Residual Risk Rating

		Consequence				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	High	Extreme
	Possible	Low	Low	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	Medium
	Rare	Low	Low	Low	Medium	Medium

How bad could it have been?

Moderate – Minor medical treatment (e.g. GP or outpatient to hospital)

How likely could it occur?

Rare – The occurrence of the event is remote and improbable

Residual Risk Rating:

Low



Control 1

Action Details		
Control Classification:	☐ Current Control ☐ Proposed Control	☒ Display on Risk Register
Control Type	Elimination	
Description of Action or Control:	Remove damaged or defective batteries from service immediately.	

Control 2

Action Details		
Control Classification:	☐ Current Control ☐ Proposed Control	☒ Display on Risk Register
Control Type	Substitution	
Description of Action or Control:	Use commercially certified battery packs with integrated protection rather than unprotected cells.	

Control 3

Action Details		
Control Classification:	☐ Current Control ☐ Proposed Control	☒ Display on Risk Register
Control Type	Isolation	
Description of Action or Control:	Charge batteries away from combustible materials in designated charging locations.	

Control 4

Action Details		
Control Classification:	☐ Current Control ☐ Proposed Control	☒ Display on Risk Register
Control Type	Engineering	
Description of Action or Control:	Battery Management System (BMS), protected charging circuitry, insulated battery enclosure.	



Control 5

Action Details

Control Classification:

☐ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Administration, training and instruction

Description of Action or Control:

Battery inspection before use, correct charging procedures, manufacturer's charging limits followed.

Control 6

Action Details

Control Classification:

☒ Current Control

☐ Proposed Control

☒ Display on Risk Register

Control Type

Personal Protective Equipment

Description of Action or Control:

Safety glasses during battery testing and charging.

Linked Safe Work Procedures

Linked Safe Work Procedures

Press the Add New Safe Work Procedure button to link a Safe Work Procedure to this Risk Assessment.

Event Number	Title	Work Activity	Category	Status
There are currently no Linked Events.				

Review and Comments

Summary

Risk Assessment Summary and Conclusion

The project primarily comprises low-risk engineering activities involving low-voltage electronics, prototype fabrication, and laboratory testing. Hazards associated with electrical work, soldering, fabrication equipment, lithium-ion batteries, waterproof testing, and manual handling have been identified and appropriate controls implemented in accordance with the hierarchy of controls.

The most significant inherent risks relate to marine deployment and environmental conditions. These risks are mitigated through staged testing (laboratory, pool, harbour, then coastal), engineering controls incorporated into the prototype design, and administrative controls including University laboratory procedures and NCSLSC operational protocols. Marine deployment and recovery will be conducted exclusively by qualified NCSLSC personnel using approved rescue vessels and established operating procedures. Field activities will only proceed following assessment of weather and sea conditions and approval from NCSLSC personnel.

Following implementation of the proposed elimination, substitution, isolation, engineering, administrative, and PPE controls, all identified hazards are reduced to low or moderate residual risk. No unacceptable residual risks have been identified that would prevent the safe completion of the project under normal operating conditions. The overall risk associated with the project is therefore considered acceptable.

☒ Risk Assessment Completed

Date Completed:

2/07/2026

Completed By:

Jonathan Walsh

Approval

Approval Comments:

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☐ Risk Assessment Approved

Date Approved:

Approved By:

Periodic Review

Risk Review Required?

☐ Yes ☒ No

Last Updated By

Jonathan Walsh

Review Interval

Date Updated

2/07/2026

File Notes

File Notes

Press the Add File Note button to add a new File Note to this Risk Assessment

Date	Category - Subject	Description	Confidential
2/07/2026	General - Operational Testing Strategy	Detailed usage of facilities and tools for the development and testing of the Low-Cost Sonobuoy for Passive Acoustic Detection and Classification Sonobuoy.	☐

Document Summary

Document Summary

Date Entered	Source	File Name	Description	Privileged and Confidential
There are no documents				