

Validation of EED Characterisation
Capability at Defence Munitions
Gosport

Research Proposal

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1. Introduction

The purpose of this document is to summarise and briefly explain the proposed work-based project as part of the Ordnance Munition and Explosives (OME) degree apprenticeship at the university of Wales Trinity Saint David (UWTSD).

The work-based project is an integral part of the OME degree apprenticeship, and the quality of the project has a substantial influence on the class of degree awarded [1]. The projects main aim is to allow the student an opportunity to develop and demonstrate their abilities on a project of their choosing using the skills they have gained during the degree apprenticeship [1].

This project will focus on the validation of the Electro-Explosive Devices (EED) Characterisation Capability at Defence Munitions (DM) Gosport. EED's are small electrically initiated explosive devices that converts electrical energy into heat to trigger an explosive reaction. With the energy produced from this reaction used to achieve a desired action [2] such as to remove a retaining pin, initiate an explosive train or produce large volume of gas quickly. Later sections of this report will describe the background to the research, aims & objectives, a brief experiment design and detail the predicted resources needed to achieve the project goals.

2. Background to the Proposed Research

Since the end of world war 2 the UK government owned defence industry has slowly been privatised and sold off reducing the number of government owned defence estates and capabilities. As a result of this the UK Ministry of Defence (MOD) has become increasingly reliant on UK private defence companies to achieve various tasks [3]. As the UK's OME safety and testing approaches are the most stringent compared to other countries within NATO, the UK is seen as the leader in OME safety and to maintain this high standard, testing in other countries would not provide good enough results.

One task that needs to be achieved as part of a complex weapon (E.g., Missile) development is the characterisation of its EED's. Nearly every missile produced in recent years will contain a number of EED's to achieve various tasks. These EED's need to be safe and suitable for service and undergo various forms of testing to determine how it will react under certain conditions, this is known as characterisation, with the main aim to determine the safety critical firing properties. This data is key to understanding and performing Hazard of Electromagnetic Radiation to Ordnance (HERO) assessments which determines its susceptibility to Electromagnetic Environmental Effects (E3) [4]. At the moment the MOD is heavily reliant on its private defence contractors and other privatised test facilities to characterise the EED's within its stockpile, which incurs a significant cost. Some of these costs can be reduced as part of the contracting phase and initial agreement between the MOD and its contractors, by specifying the EED's used within the system must be characterised as part of the equipment's developments. But this is reliant on being able to test these EED's at the limited number of test facilities.

To try and mitigate this issue DM Gosport is expanding its facilities to include the ability to conduct EED characterisation. As DM Gosport is part of the wider MOD infrastructure, the procurement arm of the MOD can take advantage of this capability and utilise DM Gosport as a test facility at a significantly reduced cost. This capability is still in its infancy with no validated test procedure for these EED's. There exists some munition processing instructions and an interim test procedure which will soon be incorporated into Def Stan 59-114¹, but no dedicated testing procedure for the characterisation work that DM Gosport wish to undertake. The projects main aim is to produce and validate a testing procedure at the DM Gosport facility, which will provide a new capability for the MOD.

¹A Def-Stan is shorthand for Defence Standard. These detail a series of material standardisations developed by the UK MOD utilised for the procurement and qualification of every item deployed by the UK armed forces. Def-Stan 59-114 sets out the principles that are required for the design, assessment, testing and use of electrical circuits and software in systems which incorporate or control explosive components, such as an EED [7]

3. Aims & Objectives

The aims and objectives for this project can be broken down into 2 key areas.

1: Produce a document incorporating all the key information from an existing Munition Processing Instruction (MPI) for a small explosive article [5]. Then combining it with the interim test procedure [4], producing a new document that can be applied to any future EED testing.

The MPI contains key safety instruction based around processing, handling, and operating an explosive article in a testing environment. These details encompass pre-test, during the test and post-test conditions including details of what to do when the item fails to initiate. By extracting this data and using it in the new document, it will ensure the new test procedure is being conducted safely and inline with approved working procedures already in place at DM Gosport. The MPI also contains instructions on how to operate the testing equipment such as voltage generator, oscilloscope, and fume extractors to name a few.

The Interim test procedure document currently contains all the evidence, arguments and proof the interim test procedure is a valid and an approved means of testing for EED characterisation. This document although extensive is not suitable to be used as an appropriate testing procedure document, as it does not contain key safety and handling instructions that are contained within the MPI.

2: The second part of this project is to then validate this new test process. This will be achieved with the use of an off the shelf initiator (typically one used for firework initiation) to represent the EED. By using the manufactures data to test against the initiator can then be subjected to the test process and the evidence at the end used to compare against the known manufacturing data. If the data matches, then it can be shown that the validation effort was successful.

A possible additional task will be to investigation the use of an inert test item to carry out the validation. It has been suggested during initial conversations with DM Gosport that the validation effort could be undertaken with the use of an inert item such as a resistor.

The rationale behind the use of a resistor comes from the way an EED operates, and the process defined in the interim test procedure, where a manufacture will define a voltage range that will initiate the EED being tested. By understanding how the voltage range translates to resistance, an appropriately rated resistor can be chosen to closely match the EED being tested.

The end goal for this project is to produce and validate a new testing capability for DM Gosport and the wider MOD. This will not only benefit the UK defence sector by adding a new qualified capability to the UK but will also save the government a significant amount in weapon system qualifications by being able to use an inhouse test facility (at a greatly reduced cost) and by not having to rely on costly industry test facilities.

4. Experimental Design

The experiment will be based around an already approved test process for EED characterisation where an EED is placed within a firing box and an appropriate amount of voltage is applied to try and initiate the device, then comparing the results to that of the manufacture stated data.

4.1 Outline of Experimental Procedure

The main procedures for the experiment are as follows [4] [5].

1. Visual inspections of all devices to be tested.
2. Inspect and test all electrical equipment in accordance with their inspection routine.
3. Place testing device into test jig within firing box
4. Attached appropriate test lead and shorting plug.
5. Close firing box lid.
6. Conduct pre firing testing.
7. Conduct firing.
8. Record results.
9. Render safe procedure post firing.
10. Disconnect initiated device from testing jig.
11. Dispose of used articles in the appropriate manner.

4.2 Data Collection

The following parameters will be tested and recorded as part of the procedure.

- Circuit resistance.
- Continuity testing pass (Y/N).
- Device fire (Y/N).
- Levels at which device fired.

4.3 Data Evaluation

The data from the experiment will be assessed to determine firing properties using the Bias Generalised Linear Model (BRGLM) as defined in the interim test procedure [4]

4.4 Risks & Limitations

All risks and limitations have been evaluated and mitigated within the MPI and DM Gosport operating instructions/procedures. All equipment to used as part of the experiment have their own assessment and mitigations in place contained within their operating manuals.

Appropriate risk assessments will be carried out prior to the commencement of any physical actives in accordance with all site specific, national, and industrial legislative requirements.

4.5 Ethical Issues

There are no ethical issues as indicated by the completed ethical form shown in annex A

6. Resources

The resource needed to conduct the document production and validation effort have been agreed to be provided by all key personnel involved. It is not foreseen additional resources will be required outside of what has already been verbally agreed. Part of the document production will be used to help determine if additional resources are required.

6.1 Resources Required

The following resources have been identified as being needed for this project. This list is not exhaustive as it is possible additional resources might become apparent further down the road of this project, it also does not include basic office resources such as PC's and other stationary items. Where human resources have been stated it is assumed the appropriate person involved will be a Suitably Qualified and Experiences Personal (SQEP).

- DM Gosport support
- Weapon technical services (WTS) support
- DM Gosport testing facility
- Test equipment at DM Gosport
- An explosive based test item
- Resistors for alternative validation method
- Transportation and accommodation whilst at DM Gosport

6.1.1 Physical Resources

The following items from the above list are physical in nature.

- DM Gosport test facility
- Test equipment at DM Gosport
- An explosive article
- Resistors

6.1.2 Human Resources

The following items are human based resources need for the project.

- DM Gosport support
- WTS support

6.1.3 Other Resources

The following list contains the resources that do not sit within the above categories.

- Transportation to and from DM Gosport
- Accommodation at DM Gosport during validation efforts

7. Reference List

- [1] School of applied computing, "Major project handbook BEng (Hons) Ordnance, Munitions and Explosives ACCA 6020," Univeristy of Wales Trinity Saint David, Swansea, 2024/2025.
- [2] L.-K. L. C.-H. L. P.-J. C. C.-W. H. S.-S. C. Jinn-Shing Lee, "A study of zirconium/potassium perchlorate primer mixtures," *Thermochimica Acta*, vol. 173, no. 0040-6031, pp. 211-218, 1990.
- [3] M. Bell, "Nato," 1 July 1994. [Online]. Available: <https://www.nato.int/docu/colloq/1994/eco9419.txt>. [Accessed 24 June 2024].
- [4] A. Delotz, "Electro-Explosive Device Characterization Interim Methodology," Ministry of Defence , Bristol, 2021.
- [5] DE&S, "Munition processing Instruction: Cartridge electrical operating fire extinguisher yellow and grey," Ministry of Defence, Gosport, 2022.
- [6] J. W. A. Dennis D. Friday, A Statistical characterization of Electro-explosive devices relevant to electromagnetic compatibility assessment, St louis: U.S Department of Commerce, 1986.
- [7] Ministry of Defence, "Def-Stan 59-114: Safety principles for electrical circuits in systems incorporating explosive components," MoD, 2012.

8. Bibliography

- [1] School of applied computing, "Major project handbook BEng (Hons) Ordnance, Munitions and Explosives ACCA 6020," Univeristy of Wales Trinity Saint David, Swansea, 2024/2025.
- [2] L.-K. L. C.-H. L. P.-J. C. C.-W. H. S.-S. C. Jinn-Shing Lee, "A study of zirconium/potassium perchlorate primer mixtures," *Thermochimica Acta*, vol. 173, no. 0040-6031, pp. 211-218, 1990.
- [3] M. Bell, "Nato," 1 July 1994. [Online]. Available: <https://www.nato.int/docu/colloq/1994/eco9419.txt>. [Accessed 24 June 2024].
- [4] A. Delotz, "Electro-Explosive Device Characterization Interim Methodology," Ministry of Defence , Bristol, 2021.
- [5] DE&S, "Munition processing Instruction: Cartridge electrical operating fire extinguisher yellow and grey," Ministry of Defence, Gosport, 2022.
- [6] J. W. A. Dennis D. Friday, A Statistical characterization of Electro-explosive devices relevant to electromagnetic compatibility assessment, St louis: U.S Department of Commerce, 1986.

[7] Ministry of Defence, “Def-Stan 59-114: Safety principles for electrical circuits in systems incorporating explosive components,” MoD, 2012.

9. ANNEX

Annex A

APPLICATION FOR ETHICAL APPROVAL

In order for research to result in benefit and minimise risk of harm, it must be conducted ethically.

The University follows the OECD Frascati manual definition of **research activity**: “creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications”. As such this covers activities undertaken by members of staff, postgraduate research students, and both taught postgraduate and undergraduate students working on dissertations/projects.

The individual undertaking the research activity is known as the “principal researcher”.

This form must be completed and approved prior to undertaking any research activity.

SECTION A: About You (Principal Researcher)

1	Full Name:	Jacob Smith
2	Student Number:	2018631
3	Email address:	2018631@student.uwtsd.ac.uk
4	Programme of Study:	Ordinance, Munitions and Explosives Degree apprenticeship
5	Director of Studies/Supervisor:	

SECTION B: Internal and External Ethical Guidance Materials

	Please list the core ethical guidance documents that have been referred to during the completion of this form (including any discipline-specific codes of research ethics, location-specific codes of research ethics, and also any specific ethical guidance relating to the proposed methodology). Please tick to confirm that your research proposal adheres to these codes and guidelines. You may add rows to this table if needed.	
1	UWTSD Research Ethics & Integrity Code of Practice	☐
2	UWTSD Research Data Management Policy	☐
3		☐

SECTION C: Details of Research Activity

1	Indicative title:	Validation of EED Characterisation Capability at Gosport		
2	Proposed start date:	June 2024	Proposed end date:	July 2025
	Introduction to the Research (maximum 300 words in each section) Ensure that you write for a <u>Non-Specialist Audience</u> when outlining your response to the three points below: <i>Purpose of Research Activity</i> <i>Proposed Research Question</i> <i>Aims of Research Activity</i> <i>Objectives of Research Activity</i> Demonstrate, briefly, how <u>Existing Research</u> has informed the proposed activity and explain <i>What the research activity will add to the body of knowledge</i> <i>How it addresses an area of importance.</i>			
3	Purpose of Research Activity Experiment based research to find a validation method for EED testing at Gosport. (this box should expand as you type)			
4	Research Question N/A no questions to be asked (this box should expand as you type)			

5	Aims of Research Activity Produce a validation exercise and complete experimental trials (this box should expand as you type)
6	Objectives of Research Activity Validation of a testing procedure (this box should expand as you type)
	Proposed data collection methods (maximum 600 words) Provide a brief summary of all the methods that may be used in the research activity to collect data, making it clear what specific techniques may be used. If methods other than those listed in this section are deemed appropriate later, additional ethical approval for those methods will be needed. You do not need to justify the methods here, but should instead describe how you intend to collect the data necessary for you to complete your project.
7	This should describe how you intend to collect data. It should not include a discussion of the theoretical basis for your data collection methods. Please note, that if you intend to collect any audio/video recordings of interviews with participants then these will be are classified as Personal Data under GDPR/DPA2018. If you intend to use these then note this in section H. Through experimental trials, testing and recording results, no data will be GDPR relevant. (this box should expand as you type)

SECTION D: Scope of Research Activity

	Will the research activity include:	YES	NO
1	Use of a questionnaire or similar research instrument?	☐	☒
2	Use of interviews?	☐	☒
3	Use of focus groups?	☐	☒
4	Use of participant diaries?	☐	☒

5	Use of video or audio recording?	☐	☒
6	Use of computer-generated log files?	☐	☒
7	Participant observation with their knowledge?	☐	☒
8	Participant observation without their knowledge?	☐	☒
9	Access to personal or confidential information without the participants' specific consent?	☐	☒
10	Administration of any questions, test stimuli, presentation that may be experienced as physically, mentally or emotionally harmful / offensive?	☐	☒
11	Performance of any acts which may cause embarrassment or affect self-esteem?	☐	☒
12	Investigation of participants involved in illegal activities?	☐	☒
13	Use of procedures that involve deception?	☐	☒
14	Administration of any substance, agent or placebo?	☐	☒
15	Working with live vertebrate animals?	☐	☒
16	Procedures that may have a negative impact on the environment?	☐	☒
17	Other primary data collection methods. Please indicate the type of data collection method(s) below.	☐	☐
	Details of any other primary data collection method: Experiment results recorded by hand, not GDPR relevant (this box should expand as you type)		

If you have ticked NO to every question then the research activity is (ethically) low risk and you may skip section E and continue to section F.

If YES to any question, then no research activity should be undertaken until full ethical approval has been obtained.

SECTION E: Intended Participants

	Who are the intended participants:	YES	NO
1	Students or staff at the University?	☐	☐
2	Adults (over the age of 18 and competent to give consent)?	☐	☐
3	Vulnerable adults?	☐	☐
4	Children and Young People under the age of 18? (Consent from Parent, Carer or Guardian will be required)	☐	☐
5	Prisoners?	☐	☐
6	Young offenders?	☐	☐
7	Those who could be considered to have a particularly dependent relationship with the investigator or a gatekeeper?	☐	☐

8	People engaged in illegal activities?	☐	☐
9	Others. Please indicate the participants below, and specifically any group who may be unable to give consent.		
	Details of any other participant groups: Complete this only if your participants cannot give consent. This includes animals (this box should expand as you type)	☐	☐

Participant numbers and source Provide an estimate of the expected number of participants. How will you identify participants and how will they be recruited?		
10	How many participants are expected?	Ballpark figures are fine, but make sure that you explain how you will identify and contact your participants. (this box should expand as you type)
11	Who will the participants be?	 (this box should expand as you type)
12	How will you identify the participants?	 (this box should expand as you type)

Information for participants:		YES	NO	N/A
13	Will you describe the main research procedures to participants in advance, so that they are informed about what to expect?	☐	☐	☐
14	Will you tell participants that their participation is voluntary?	☐	☐	☐
15	Will you obtain written consent for participation?	☐	☐	☐
16	Will you explain to participants that refusal to participate in the research will not affect their treatment or education (if relevant)?	☐	☐	☐
17	If the research is observational, will you ask participants for their consent to being observed?	☐	☐	☐
18	Will you tell participants that they may withdraw from the research at any time and for any reason?	☐	☐	☐
19	With questionnaires, will you give participants the option of omitting questions they do not want to answer?	☐	☐	☐
20	Will you tell participants that their data will be treated with full confidentiality and that, if published, it will not be identifiable as theirs?	☐	☐	☐
21	Will you debrief participants at the end of their participation, in a way appropriate to the type of research undertaken?	☐	☐	☐
22	If NO to any of above questions, please give an explanation			
	You should be able to tick YES for all of these questions. If not, then explain why not in this box.			

	(this box should expand as you type)
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	Information for participants:	YES	NO	N/A
24	Will participants be paid?	☐	☐	☐
25	Is specialist electrical or other equipment to be used with participants?	☐	☐	☐
26	Are there any financial or other interests to the investigator or University arising from this study?	☐	☐	☐
27	Will the research activity involve deliberately misleading participants in any way, or the partial or full concealment of the specific study aims?	☐	☐	☐
28	If YES to any question, please provide full details			
	You should be able to tick NO for most of these questions. For any cases that you have ticked YES then provide details in this box. If you are using cameras/voice recorders to record interviews then please state that in this box. (this box should expand as you type)			

SECTION F: Anticipated Risks

	Outline any anticipated risks that may adversely affect any of the participants, the researchers and/or the University, and the steps that will be taken to address them.	
1	Risks to participants For example: sector-specific health & safety, emotional distress, financial disclosure, physical harm, transfer of personal data, sensitive organisational information. If you have identified in section D that there are no participants then enter N/A and go skip to question 3.	
	Risk to participants: There are always risks. Do not write N/A unless you have no participants. N/A no participants (this box should expand as you type)	How you will mitigate the risk to participants: N/A no participants (this box should expand as you type)

2	If research activity may include sensitive, embarrassing or upsetting topics (e.g. sexual activity, drug use) or issues likely to disclose information requiring further action (e.g. criminal activity), give details of the procedures to deal with these issues, including any support/advice (e.g. helpline numbers) to be offered to participants. Note that where applicable, consent procedures should make it clear that if something potentially or actually illegal is discovered in the course of a project, it may need to be disclosed to the proper authorities	
	N/A no participants <i>(this box should expand as you type)</i>	
3	Risks to the investigator For example: personal health & safety, physical harm, emotional distress, risk of accusation of harm/impropriety, conflict of interest	
	Risk to the investigator: There are always risks. Do not write NA. Inherent risk of working and handling small quantities of explosives. <i>(this box should expand as you type)</i>	How you will mitigate the risk to the investigator: Procedures, restriction, and risk assessments are already in place for this activity. All relevant Precautions, PPE, procedures and activities will be carried out in accordance with appropriate rules, regulations and restrictions. <i>(this box should expand as you type)</i>
4	University/institutional risks For example: adverse publicity, financial loss, data protection	
	Risk to the University: There are always risks. Do not write NA. No financial loss, possible adverse publicity due to the perception of explosives by the general public <i>(this box should expand as you type)</i>	How you will mitigate the risk to the University: All work will be kept out of the public eye with appropriate security procedures being followed <i>(this box should expand as you type)</i>
5	Environmental risks For example: accidental spillage of pollutants, damage to local ecosystems	

	Risk to the environment: Combustion gasses is the main environmental risk. <i>(this box should expand as you type)</i>	How you will mitigate the risk to environment: Correct extraction of gasses from the combustion chamber are in place along with appropriate filtration systems to remove harmful gasses before venting to atmosphere <i>(this box should expand as you type)</i>
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SECTION G: Feedback, Consent and Confidentiality

If you have identified in section D that there are no participants then enter skip this section and continue to section H.

1	Feedback What de-briefing and feedback will be provided to participants, how will this be done and when?
	You don't need to email your participants with your final report. A good alternative is to set up an email address that they will be able to contact for further details or results. <i>(this box should expand as you type)</i>
2	Informed consent Describe the arrangements to inform potential participants, before providing consent, of what is involved in participating. Describe the arrangements for participants to provide full consent before data collection begins. If gaining consent in this way is inappropriate, explain how consent will be obtained and recorded in accordance with prevailing data protection legislation.
	If you are using a paper questionnaire then you should have the participants sign an appropriate consent form. These forms will count as personal data and should be noted as such in section J. If you are using an online questionnaire, then you should have a screen before the questions start that acts as a consent form, informing participants that by clicking on the NEXT button they are providing consent. <i>(this box should expand as you type)</i>

3	Confidentiality / Anonymity Set out how anonymity of participants and confidentiality will be ensured in any outputs. If anonymity is not being offered, explain why this is the case.
	Do not collect names unless you really need them. Do not name participants or organisations in any research publications (including the thesis) without their explicit permission. (this box should expand as you type)

SECTION H: Data Protection and Storage

	Does the research activity involve personal data (as defined by the General Data Protection Regulation 2016 “GDPR” and the Data Protection Act 2018 “DPA”)?	YES	NO
1	“Personal data” means any information relating to an identified or identifiable natural person (‘data subject’). An identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person. Any video or audio recordings of participants is considered to be personal data.	☐	x
	If YES, provide a description of the data and explain why this data needs to be collected:		
2	This includes audio/video data of participants, but can also include IP addresses and usernames. Names, addresses and emails also count, as do consent forms. (this box should expand as you type)		
	Does it involve special category data (as defined by the GDPR)?	YES	NO
3	“Special category data” means sensitive personal data consisting of information as to the data subjects’ – (a) racial or ethnic origin, (b) political opinions, (c) religious beliefs or other beliefs of a similar nature, (d) membership of a trade union (within the meaning of the Trade Union and Labour Relations (Consolidation) Act 1992), (e) physical or mental health or condition, (f) sexual life, (g) genetics, (h) biometric data (as used for ID purposes),	☐	x
	If YES, provide a description of the special category data and explain why this data needs to be collected:		
4	What counts as ‘sensitive’ will differ between cultures. Any information on behaviour that is not in accordance with cultural norms would count as sensitive personal data.		

	(this box should expand as you type)
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	Will data from the research activity (collected data, drafts of the thesis, or materials for publication) be stored in any of the following ways?	YES	NO
5	Manual files (i.e. in paper form)?	☐	☒
6	University computers?	☒	☐
7	Private company computers?	☒	☐
8	Home or other personal computers?	☒	☐
9	Laptop computers/ CDs/ Portable disk-drives/ memory sticks?	☐	☒
10	"Cloud" storage or websites?	☒	☐
11	Other – specify:	☐	☒
12	For all stored data, explain the measures in place to ensure the security of the data collected, data confidentiality, including details of backup procedures, password protection, encryption, anonymisation and pseudonymisation: If possible, save your data on computers that are secure and regularly backed up. Many cloud services only provide GDPR-compliant storage for business customers. An example of suitable text is given below. <i>All data will be kept in password protected cloud storage on the University Office 365 system which will not be shared. Audio/visual data will be transcribed and would be shown to participants to check accuracy of reporting. Any USB sticks used to store or transfer data will be password protected. All participants will be given a unique identifier to ensure confidentiality and this list will be kept securely in the password protected folder.</i> My work (including data) will be stored primarily on my secure work laptop. This Laptop is secured using government level protection that meets the security requirements to hold officially classified documents (the documents for this work will be unclassified). Personal PC and university PC's will only be used when checking final draft of the project and for submitting of the project. (this box should expand as you type)		

Data Protection			
	Will the research activity involve any of the following activities:	YES	NO
13	Electronic transfer of data in any form?	☒	☐
14	Sharing of data with others at the University outside of the immediate research team?	☐	☒

15	Sharing of data with other organisations?	☐	☒
16	Export of data outside the UK or importing of data from outside the UK?	☐	☒
17	Use of personal addresses, postcodes, faxes, emails or telephone numbers?	☒	☐
18	Publication of data that might allow identification of individuals?	☐	☒
19	If YES to any question, please provide full details, explaining how this will be conducted in accordance with the GDPR and Data Protection Act (2018) (and/or any international equivalent):		
	This includes data such as drafts of your thesis as well as experimental or survey data. An example of suitable text is given below. <i>All data will be encrypted and kept in password protected cloud storage on the University Office 365 system which will not be shared. Any USB sticks used to store or transfer data will be password protected. All data transfers will be encrypted and password protected. All participants will be given a unique identifier to ensure confidentiality and this list will be kept securely in the password protected folder. The data will be stored until the completion of the project and then deleted. In accordance with the DPA2018, participants will have the right to ask to see what data is held relating to them, and this data will be deleted immediately if the participant requests this, in which case the data will not be used in the project.</i> Data will only be transferred between my work email, personal email and university email to facilitate transferring of my project for submission. Others within my organisation will be privy to the data but only for their expert guidance and advice. <i>(this box should expand as you type)</i>		
20	List all who will have access to the data generated by the research activity:		
	Normally the principal researcher, possibly also the supervisor and, if the project has an industrial partner, a representative of that partner. Possibly also external examiner or second marker? Line manager On site facilitator at Gosport In house specialist at work University staff assigned to me for the project support. University OME degree leads/staff <i>(this box should expand as you type)</i>		
21	List who will have control of, and act as custodian(s) for, data generated by the research activity:		
	Usually the principal researcher. Myself <i>(this box should expand as you type)</i>		
22	Give details of data storage arrangements, including security measures in place to protect the data, where data will be stored, how long for, and in what form.		
	<i>All data will be encrypted and kept in password protected cloud storage on the University Office 365 system which will not be shared. Any USB sticks used to store or transfer data will be password protected, and will be reformatted at the end of the project in order to</i>		

	<i>destroy the data. The data will be stored until the completion of the project and then deleted.</i> All data will be stored on an encrypted laptop and cloud service provided by work. External copies will be kept on personal PC and university PC as backups. <i>(this box should expand as you type)</i>	
22	Confirm that you have read the UWTSD guidance on data management (see https://www.uwtsd.ac.uk/library/research-data-management/)	☒
23	Confirm that you are aware that you need to keep all data until after your research has completed or the end of your funding	☒

SECTION I: Declaration

	The information which I have provided is correct and complete to the best of my knowledge. I have attempted to identify any risks and issues related to the research activity and acknowledge my obligations and the rights of the participants. In submitting this application I hereby confirm that I undertake to ensure that the above named research activity will meet the University's Research Ethics and Integrity Code of Practice which is published on the website: https://www.uwtsd.ac.uk/research/research-ethics/		
1	Signature of applicant:	J. Smith	Date: 21/05/2024
2	Director of Studies/Supervisor:		Date:
3	Signature:		

FOR INTERNAL USE ONLY:

	Ethical approval given		
1	Signature of assessor:		Date:
2	Name:		

3	Role:	
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