



Risk Assessment for:

Trial of _____ Prototype operating
in the open air on PTN range.

DIIS: _____

Issue: 1.0

Assessor: _____

Date: 27 January 2012

Review by Competent Person(s):		
Reviewer :	Reviewer :	Reviewer _____
Position : Detection	Position :	Position _____
Signature	Signature	Signature _____
Date :	Date :	Date : 7/2/2012
Authorisation:		
<p>Note: For Medium, Low or Minimal Residual Risk, authorisation is by Department Manager/Head of Function or their delegated deputies. For High Residual Risk, authorisation is by a Dstl Director.</p>		
<p>I authorise the above process to commence/continue on the basis that the hazards have been thoroughly considered and the associated risks assessed and controlled to a tolerable level.</p>		
<ul style="list-style-type: none">• The Trials Conducting Officer _____ is to ensure that this and related risk assessments are brought to the attention of all persons involved in this activity and that a copy is held on departmental files for at least 3 years after the activity is completed. The risk assessment must then be archived for a period of at least 50 years.		
Name: _____	Signature _____	Position: _____
		Date: 7/2/12

Record of Change

Issue	Date	Details of Change

Authorisation

Date	Name	Signature	Remarks

Periodic Review (Risk Assessment Reviewer)

Date	Name	Signature	Remarks

1. Process Description/Workplace/Work Instruction

_____ are carrying out the procurement of a _____ and _____. As part of this, Dstl have been tasked to demonstrate the performance of a Proof of Principle Prototype (PoPP) _____ developed from research funding. This trial is to confirm that the operational performance documented in the research phase for the _____ PoPP is valid for operation in outdoor environments whilst sampling open air.

This RA facilitates operation of the _____ PoPP _____ open air locations (such as _____ upon PTN Range as directed by _____ and described in _____).

Should rain prevail for the period of the trial then the trial will be relocated to the _____.

On the trials site the _____ will be closely grouped with meteorological systems and optical particle spectrometers. The _____ will sample open air for defined intervals during which they will be exposed to periodic disseminations of aerosolised BW simulants BG and OA¹ (_____ details). Upon completion of each sampling interval the samples will be removed and transported to the laboratory for analysis. Disseminations will be made _____ upwind of the _____ the distance depending on the weather. Interferents such as _____ may also be disseminated during this trial if time allows.

Detection staff will conduct the experimental work with oversight by the appointed _____ Trials Conducting Officer (TCO).

In summary the trial will consist of the following activities/procedures:

1. Pre-trial preparation and setup.
 - _____ and ancillary equipments will be set-up and connected to available electrical supply using approved cabling and connectors.
 - Operation will then be confirmed.
2. Conduct of trial
 - Daily briefing of each day's work will be communicated by the TCO from _____ and the Trial Manager (TM) from _____ to Trials participants (all detailed in Appendix 1).
 - _____ and ancillary equipments will be set running unless already running over night.
 - Aerosol disseminations of BG and OA will be made using one of the following techniques:
 1. _____ (wet slurry)
 2. _____ (either wet slurry or a dry powder).
 3. _____ (wet slurry).
 - Disseminations will be repeated as required. It is anticipated that two disseminations will be achieved in each working day.

¹ OA = ovalbumin, BG = Spores of *Bacillus atrophaeus*, classified as ACDP Hazard Group 1 in accordance with DPAG guidelines _____

- On completion of the trial the [redacted] ancillary equipments and infrastructure will be wiped down with disinfectant/antiseptic surface wipes where required and the trials area cleared of all equipment.

Responsibilities

The Group Leader (GL) [redacted] deems all [redacted] staff named in this Risk Assessment to be competent to undertake their specified roles during the trial.

[redacted] will provide a Trials Manager, [redacted], who will be responsible for scientific and technical procedures of the work program.

[redacted] staff from [redacted] Group will be responsible for operation of Dstl sampling/monitoring equipment.

The Group Leader (GL) [redacted] deems all [redacted] range staff named in this Risk Assessment to be competent to undertake their specified roles during the trial.

[redacted] will appoint a Trials Conducting Officer [redacted], who will be responsible for all health and safety aspects on the trials site and ensuring that the procedures referred to in this document and associated documents are implemented and complied with at all times.

[redacted] as host will be responsible for:

- Provision of safe premises/facilities to undertake the work.
- Provision of trained competent staff to support and/or undertake activities as detailed in their method statements and risk assessments in support of [redacted] whilst on the PTN range.
- Provision of a safety brief to [redacted] staff on emergency evacuation procedures, welfare arrangements (toilets rest rooms and eating facilities) medical procedures and points of contact.
- Provision of suitable access control and security arrangements.

Range Control procedures will exclude non-trials personnel from the area without prior direct positive communication from the TCO.

Range regulations prevent any lone working on the range and the following personnel from accessing the Range;

- pregnant women
- personnel under 18 years of age
- personnel under certain medication (e.g. Immunosuppressant Drugs).

The TCO will ensure that any inexperienced staff and visitors are closely monitored and controlled in a safe clean area throughout the trial. All will receive a safety brief on the hazards associated with the work and nature of the Range.

2. Hazard Identification

Potential hazards identified for this trial are:

- a) Trauma from manual handling
- b) Trauma from slips, trips or falls
- c) Electrocution from electrical supplies and equipment.
- d) Exposure to locally high concentrations of respirable particulate aerosols (including live ACDP Hazard Group 1 micro biological material BG and protein OA) arising from each dissemination.
- e) Trauma from operation of equipment
- f) Reduced hearing due to exposure to noise.
- g) Fire
- h) Road Traffic Accident (RTA)
- i) Skin/respiratory trauma from use of [REDACTED] interferent (including [REDACTED])
- j) Night working

3. Who might be affected

Dstl staff from [REDACTED] Group at Dstl Porton Down, typically no more than six in number as listed in Appendix 1, will be responsible for operation of Dstl aerosol dissemination equipment, the [REDACTED] and ancillary equipments.

Dstl staff from [REDACTED], typically no more than two in number and as listed in Appendix 1, will provide range support and safety links to the [REDACTED] team.

Visitors, typically no more than four in number as listed in Appendix 1

4. What might be affected

Risk of damage to sampling/dissemination equipment in the event of fire.

Risk of damage to PTN range and infrastructure in the event of fire.

No others identified.

5. Environmental Aspects and Operational Controls

There will be a degree of noise from equipment and personnel movement (vehicles etc) during the hours of the trial. All of these will decrease rapidly with distance from the trials area and will not add significantly to ambient noise levels.

Disseminations of BG, OA and [REDACTED] will release small quantities of material into the local environment that will rapidly decrease in concentration with distance from the release point. There may be some local deposition around the trials area, but will cause no harm to fauna or flora. BG is endemic in soil

To prevent any potential contamination of the main site with BG that may corrupt experimental data, open releases of BG will only be conducted when the ambient wind is blowing away from the main site. There is no maximum or minimum wind strength required for the work.

Any bio-waste material will be collected daily and placed in bio-autoclave bags and discard tins before final disposal at the end of the trial through [REDACTED] Dept approved procedures for autoclaving and incineration.

Any general waste will be placed in dustbin liners and disposed of via normal Dstl site procedures. (ref Dstl MS>Waste management)

Following completion of the trial the exterior of [REDACTED] and ancillary equipment will be wiped down with disinfectant/antiseptic surface wipes.

If generators are required (location dependent) refuelling will take place in compliance with Dstl/Doc [REDACTED] (Use of Mobile Diesel Bowers for Plant Refuelling on [REDACTED] Range).

The refuelling bowser supplied by [REDACTED] will be internally banded and a suitable spill kit will be on site in case a spill takes place.

6. Control Measures

a) Trauma from Manual handling

- All personnel will be required to wear footwear meeting BSEN 345: 200J or better.
- Set up will require manual handling of equipment with movement minimised as much as possible through the use of trolleys and or vehicles.
- Due to the weight of the [REDACTED] (up to [REDACTED] and typical work undertaken by the [REDACTED] team, they are designated as two-man lift items and as such will be moved by two persons at all times.
- Only competent experienced operators, who have attended a manual handling awareness course (ref [REDACTED] - Manual Handling Awareness) within the last 2 years, will perform any lifting tasks.
- Recommended Maximum Manual Handling load guidelines will be followed. (Further info available from <http://www.hse.gov.uk/msd/mac/index.htm> and Manual handling assessment chart(MAC)- <http://www.hse.gov.uk/pubns/indg383.pdf>)
- Leather protective gloves will be provided to individuals if they wish to wear them for lifting activities.

b) Trauma slips, trips or falls

- All personnel will be briefed by the TCO regarding slips/trips and falls and the rough nature of the range.
- All personnel will ensure that clear paths are maintained to the equipment and that all unnecessary equipment is cleared. This will be checked throughout the trial by the TCO and TM.
- IPE footwear as per (a) to be worn at all times.

c) Electrocution from electrical supplies and or equipment

- All electrical equipment used will have passed a Portable Appliance Test (PAT) undertaken within the last 12 months. The test and due date is recorded on the appliance in accordance with DSTL "Portable Appliance Testing Guidance"
- Cabling and connectors will be routed away from points of access and visually inspected for damage before use and during regular TCO inspections.
- The mains power supply used to power the equipment will have a 30mA RCCD fitted in accordance with electrical installation regulations [redacted] to confirm this, or 30mA RCCDs will be fitted as close as reasonably practicable to the power outlet.
- All external plugs and sockets will conform to at least IP44 standard or be housed in weatherproof housings meeting IP44 standard or higher.
- All the equipment used will be suitable for operation in UK environmental conditions.
- (If required) the generator will be suitably serviced, positioned and earthed by the supplying company [redacted] to supply/source)
- Refuelling of the generator will be by [redacted] personnel only in accordance with Dstl/ [redacted]

d) Exposure to biological aerosols

- The bio-simulants selected for the work are those normally used for open air disseminations ie BG (Bacillus atrophaeus) is used as a BW agent simulant and protein OA (ovalbumen-egg white) is used as a simulant. BG is classified as ACDP Hazard Group 1 in accordance with DPAG guidelines (See MSDS) and is non-pathogenic to normal healthy humans. In common with high concentrations of any respirable material, there is an irritant 'dust' risk associated with both materials
- The over-arching requirement is to prevent or minimise exposure to aerosols of simulant. (Personnel will not be deliberately subjected to aerosol.)
- BG slurries, typically 2L of [redacted] per run, will be prepared [redacted] and will be handled following the guidelines [redacted]
- Staff involved in the trial will be declared medically fit to work with the non-pathogenic microorganism and will undergo an annual lung function test.
- During disseminations personnel will locate themselves upwind of dissemination equipment. [redacted] will be operated in accordance with the controls given in Dstl [redacted]
- Open air disseminations of BG will only be made when the ambient wind is blowing away from the main site, to prevent potential contamination of the main site.. There is no maximum or minimum wind strength required for the work. The TCO and TM will determine a cover area (using modelled predictions) and request this from range control. (The purpose of the cover area is to minimise any deliberate exposure to aerosolised material and is to include an upwind element to minimise external movement interfering with the work.)
- Although it is not anticipated, access to equipment within the dissemination area may be allowed following agreement with the TCO

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and TM. During any such work personnel will wear Nitrile gloves (BSEN 374), respirators and limited life coveralls ie Paper suits – which provide basic protection against particulate.

- o Typical airborne concentrations of BG planned for the trial are (Total cfu per run). although quantities upto a maximum of cfu total per trial are permitted upon Porton range as agreed by the

e) Trauma from operation of equipment

- o No specific hazards have been identified with the operation of the in addition to those detailed elsewhere in this document ie electrocution, but operation of has been included for completeness.
- o staff will be experienced in the use of the equipment and have under gone instruction in the safe operation of the equipment.
- o All the equipment will be operated in accordance with the manufactures standard operating procedures/manuals.
- o Instruction manuals in the operation of the equipment will also be available at all times.
- o The equipment will be positioned away from general access areas and a local cordon created using high visibility tape. Signage will provide details of the staff responsible for the equipment and an emergency number.

f) Reduced hearing due to exposure to noise.

- o The noise level of any individual piece of equipment deployed should not exceed 85dB at 1m (frequency tolerable to human ear), but may exceed 80dB at 1m. As such the use of hearing protection, whilst not mandatory will be observed when operating the collectors.
- o Personnel attendance at the kit will also be kept to a minimum. Typically only 20 minutes exposure per 24 hour period is anticipated.
- o Ear defenders conforming to BSEN352.1 (ear muffs) or BSEN 352.2 (ear plugs) will be available to Dstl operatives at all times.
- o Equipment will positioned away from local access areas negating accidental exposure to non trials participants. This will be monitored and managed by

g) Fire

- o All the equipment used will comply with current UK safety and environmental legislation and be suitable for operation in all UK environmental conditions as such the likelihood of fire is remote.
- o The equipment will be sited remotely and away from buildings, where possible, so that in the unlikely event of fire no other infrastructure and or equipment will be affected.
- o Remote electrical isolation switches, where identified and provided by the, will be used if it is safe to do so.
- o Fire extinguishers provided by will be on site and will be used if suitable in the event of a fire if it is safe to do so.

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h) Trauma from driving to and from trials site.

- Only dstl vehicles will be taken onto the range by personnel familiar and competent in driving the particular class of vehicle.
- National and local driving (as briefed by rules/regulations will be adhered to at all times.

i) Night working.

- No lone working will be permitted at anytime and a minimum of two persons will always be present if night working is required.
- Prior to the commencement of night working, suitable lighting will be deployed around the around work and access area.
- Torches and headlights will be available to Dstl personnel at all times of night working.

6.1 Information, Instruction and Training

All [redacted] team personnel will be skilled in the use of [redacted] Dept. equipment.

The TCO will be responsible for the safe conduct of the work. The TO will establish that work can start and will brief personnel of the daily programme and ensure that all participants fully understand the process.

Only footwear conforming to BSEN 345: 200J or better is required by this RA for the work when lifting or moving equipment, although additional PPE requirements issued by the host will be adhered to by Dstl personnel at all times.

A [redacted] will be maintained by the TCO.

A [redacted] log will be maintained by the TM.

The following documentation will be directly or indirectly, applicable:

DSTI [redacted] for the demonstration of [redacted] PoPP
Draft

[redacted] Range Operating Plan Version 11 dated Issue 1

Separate risk assessments and guidance:

Dstl/ [redacted] Preparation of [redacted] for use in Field Trials and
[redacted] Testing. (Extant)

Dstl/Doc Refuelling generators [redacted]

Dstl/Doc [redacted]

6.2 Workplace monitoring and Maintenance

Equipment deployed during this work will have undergone Portable Appliance Testing as a function of Dstl safety procedures. (ref Dstl MS> [redacted])

The TCO will perform daily inspections of the work area and have the authority to stop work at all times.

[redacted] is to ensure that the electrical supplies are safe at all times via positive communication from supply company.

Dstl vehicles are maintained/serviced and MOTed in accordance with manufactures and the Department for Transport instructions.

6.3 Health Surveillance

All [redacted] staff participating in the trial will have successfully undergone an annual medical at OHS

7. Risk Rating

The residual risks for each hazard identified in Section 2 after application of all control measures specified in Section 6 are given below

a) Trauma from manual handling:

UNLIKELY, risk of SERIOUS injury (1 x 3 = 3), **LOW RISK**

b) Trauma from slips, trips or falls:

MAY HAPPEN, risk of MINOR injury (2 x 2 = 4), **LOW RISK**

c) Electrocution from electrical supplies and or equipment:

UNLIKELY, risk of DEATH (1 x 5 = 5), **LOW RISK**

d) Exposure to biological aerosols:

UNLIKELY, risk of MINOR injury (1 x 2 = 2), **MINIMAL RISK**

e) Trauma from operation of equipment:

UNLIKELY, risk of MINOR injury (1 x 1 = 1), **MINIMAL RISK**

f) Exposure to noise:

UNLIKELY, risk of SERIOUS injury (1 x 3 = 3), **LOW RISK**

g) Fire:

UNLIKELY, risk of DEATH (1 x 5 = 5), **LOW RISK**

h) Trauma from driving to and from trials site:

UNLIKELY, risk of DEATH (1 x 5 = 5), **LOW RISK**

i) Night working:

UNLIKELY, risk of MINOR (1 x 2 = 2), **MINIMAL RISK**

8. Other Factors

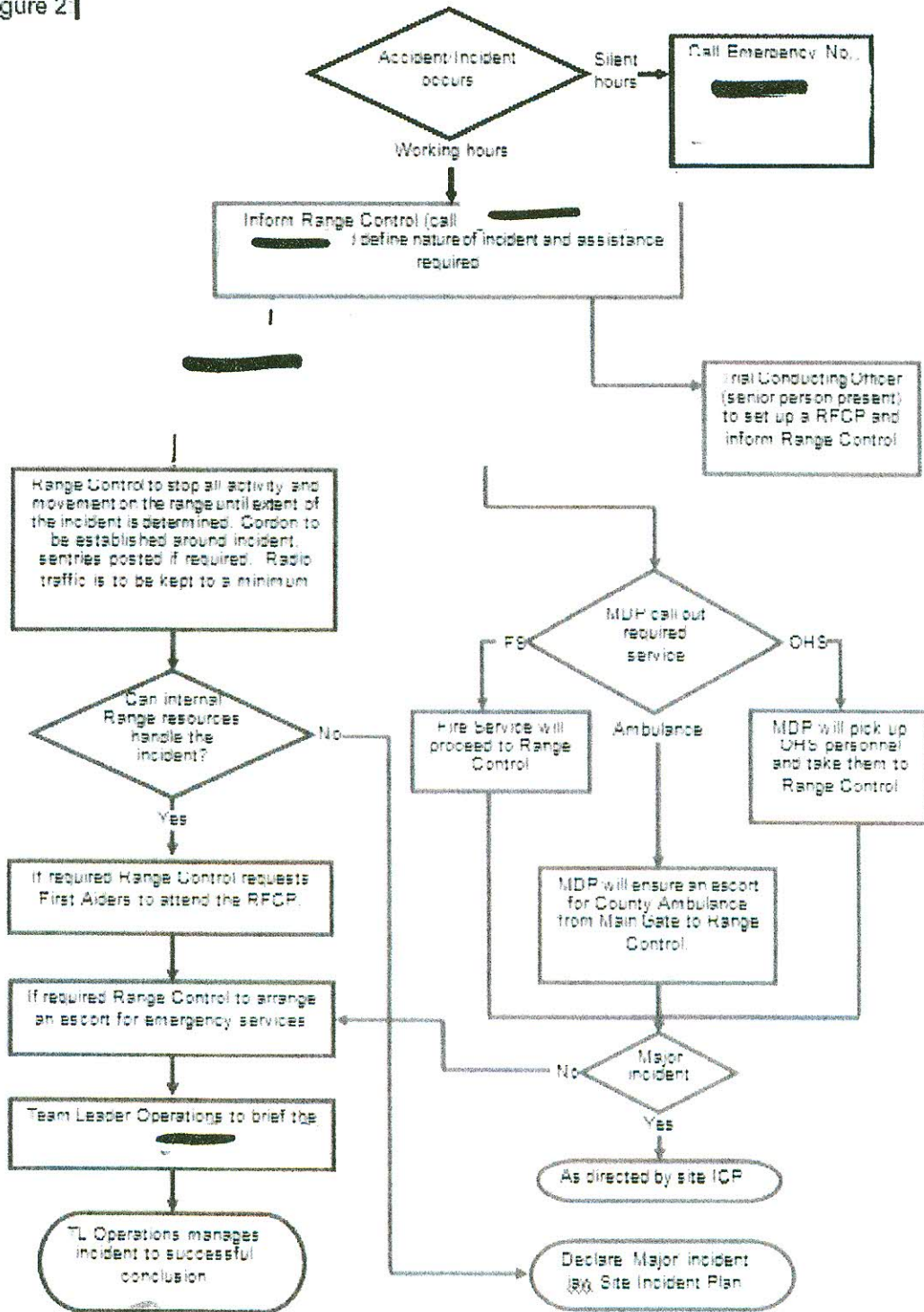
None identified

9. Transport

Simulant materials will be transported to the facility in labelled, sealed Duran bottles carried in a grey metal discard tin in accordance with Dstl [REDACTED] Preparation of [REDACTED] for use in Field Trials and Equipment Testing

Unused simulant will be kept in discard tins and will be transported in the open back of a vehicle for autoclaving at the autoclave facility, or taken back to the laboratory for use in subsequent trials.

Figure 2 |



11. Disposal

General waste will be disposed of in accordance with Dstl procedures and '██████████'

Biological waste items will be placed into bio-disposal bags and sealed. Items will include paper towels from mopping up spillage as well as trial waste. These will then be taken to ██████████, grey discard tins and autoclaved for disposal.
















If appropriate, liquid waste will be placed into 1 litre Durans and labelled correctly. The Durans will then be taken to ██████████ grey discard tins and autoclaved for disposal.

12. Risk Assessment Awareness Record

See Appendix 1

Appendix 1 – Risk Assessment Awareness Record

The following staff have read, or been briefed, and understand the requirements of the attached risk assessment and will comply with the controls specified therein.

Name	Date
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