University Occupational Health and Safety Guidance Notes

TRANSPORT OF INFECTIOUS SUBSTANCES

1. PURPOSE

The purpose of this document is to provide guidance on the transport of infectious substances in order to comply with the relevant legislation. The regulations in force in the UK are derived from European Directives which in turn implement international regulations issued by the United Nations.

This Guidance Note makes reference to the law but only in respect of providing practical guidance on the transport process. Guidance is also given on import and export controls as they apply to biological material.

This document should be used in conjunction with the Occupational Health and Safety Standard for Biological Safety.

2. SCOPE

This document applies to those who are responsible for packaging infectious substances for transport and for those who have management responsibilities within this area. It also applies to University personnel whose work involves the transport of infectious substances

3. ABBREVIATIONS

DBSC	Departmental Biological Safety Co-ordinator
DGR	Dangerous Goods Regulations
GM	Genetically Modified
GMM/GMO	Genetically Modified Micro-organism/Organism
HG	Hazard Group
HoD	Head of Department
HSE	Health and Safety Executive
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
PI	Principle Investigator
UBSA	University Biological Safety Adviser
UN	United Nations

4. DEFINITIONS

4.1 **Cultures** are the result of a process by which pathogens are amplified or propagated resulting in the generation of a high concentration stock. The definition refers to cultures generated for the intentional generation of pathogens and does not apply to those generated for diagnostic or clinical purposes.

4.2 **Dangerous Goods** are liquid or solid substances and articles containing them that have been tested and assessed against internationally agreed criteria - a process called classification - and found to be potentially hazardous when carried. Dangerous goods are assigned to different Classes depending on their predominant hazard as detailed in Table 1.

4.3 **Infectious substances**, for the purposes of transport, are defined as substances which are known or are reasonably expected to contain pathogens.

4.4 **Pathogens** are defined as micro-organisms (including bacteria, viruses, rickettsiae, parasites, fungi) and other agents such as prions, which can cause disease in humans or animals. The definition is applied to all biological specimens except those explicitly excluded (see Section 6.1.10).

4.5 **Proper shipping name** is the name used to clearly identify the dangerous article or substance (see Section 6.1).

5. SPECIFIC RESPONSIBILITIES

5.1 **Head of Department / School / Director** must:

- Ensure that appropriate members of staff are identified and trained to be licensed packers of infectious substances;

- Ensure that a responsible person is appointed to co-ordinate all work involving the transportation of infectious substances;
- Ensure that the duties of the nominated co-ordinator are clearly defined;
- Ensure, where necessary, the appointment of laboratory/floor managers to oversee the safety requirements in the internal transportation of biological material;
- Ensure that appropriate management, administrative and technical arrangements are in place to effectively control risks and these are regularly reviewed;
- Ensure that the above procedures are incorporated into general departmental arrangements and communicated to relevant staff.

5.2 **Line Manager / Principle Investigators / Academic Supervisor** must:

- Identify transportation classification of biological agents by referring to information within this Guidance Note and also by referring to the IATA Guidance https://www.iata.org/about/Pages/index.aspx%20;
- Inform the IATA licensed staff member of the requirement to transport relevant material and supply them with the appropriate information on classification and also the appropriate handling and spillage instructions to be inserted into the accompanying transport documentation;
- Ensure that staff and students within their area of control, whose work involves the use of biological material, are provided with relevant information, instruction, training and supervision.

5.3 **Authorised IATA Trained Personnel** who are carrying out the task of packing and shipping potentially infectious material must:

- Act as the nominated co-ordinator for the transport of infectious substances if appointed by the HoD;
- Understand their need and obligation to be familiar with regulatory requirements;
- Undergo the appropriate IATA training for the transport of Class 6.2 Infectious Substances and Dry Ice;
- Provide advice, upon request and within the scope of their training, to departmental personnel on packaging requirements for Class 6.2 Infectious Substances and Dry Ice;
- Only undertake the responsibility of packaging and shipping of infectious substances upon completion of training and successful completion of the IATA exam and therefore hold a valid IATA licence for the packing and shipping of Class 6.2 Infectious Substances (and Dry Ice).

5.4 **All Staff, Students and Visitors** whose work involves the transport of infectious substances and dry ice have a responsibility to:

- Comply with the internal and external transport arrangements put in place to prevent or reduce exposure to infectious substances.
- Undertake any relevant information, instruction and training about the risks of working with biological agents.

6. TRANSPORT OF INFECTIOUS MATERIAL

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 is the main UK legislation that covers transport by road and rail. The approach to safe transport of infectious substances is similar for the different modes of transport but, in general, substances sent via air require more stringent packaging.

The Technical Instructions for the Safe Transport of Dangerous Goods by Air published by the International Civil Aviation Organization (ICAO) are the legally binding international regulations. The ICAO rules apply on all international flights. For national flights, i.e. flights within one country, national civil aviation authorities apply national legislation. This is normally based on the ICAO provisions, but may incorporate variations.

The International Air Transport Association (IATA) publishes Dangerous Goods Regulations (DGR) that incorporates the ICAO provisions and may add further restrictions.

State and operator variations are published in the ICAO Technical Instructions and in the IATA Dangerous Goods Regulations.

There are 3 steps involved in the safe transport of infectious material: Classification; Packaging and Labelling; and Transport.

6.1 Classification

Dangerous goods are assigned to different Classes depending on their predominant hazard as detailed in Table 1.

Table 1. List of dangerous goods categorised by Class.

CLASS	TYPE OF DANGEROUS GOODS/PREDOMINANT HAZARD
1	Explosive substances and articles
2	Gases
3	Flammable liquids
4	Flammable solids
5	Oxidizing substances
6	Toxic and infectious substances 6.1 Toxic substances **6.2 Infectious substances**
7	Radioactive material
8	Corrosive substances
9	Miscellaneous dangerous substances and articles

The flowchart contained in the Information Sheet 'Classification of infectious substances for transport' should be used to determine the classification of the material to be transported.

For the purposes of transport, the UN description divides infectious substances into 2 categories with UN number and proper shipping name assigned as in Table 2.

Table 2. Categorisation of Class 6.2 Infectious substances for the purpose of transport.

CATEGORY	DEFINITION	UN NUMBER/PROPER SHIPPING NAME
A	An infectious substance which is transported in a form that, when exposure to it occurs, is capable of causing permanent disability, life threatening or fatal disease in otherwise healthy humans or animals.	UN 2814 INFECTIOUS SUBSTANCE, AFFECTING HUMANS UN 2900 INFECTIOUS SUBSTANCE, AFFECTING ANIMALS ONLY
B	An infectious substance which does not meet the criteria for inclusion in Category A	UN 3373 BIOLOGICAL SUSBTANCE, CATEGORY B

6.1.1 The indicative list of Category A agents affecting humans – UN2814

The following table is an indicative list of infectious substances included in Category A in any form unless otherwise indicated and should not be regarded as exhaustive. These are all HG4, many HG3 and some HG2 agents. Other infectious substances, including new or emerging pathogens that meet the same criteria as Category A (see Table 2) must be included in Category A. Some pathogens are only classified as Category A in culture form.

UN No. 2814 Infectious substances affecting humans	*Bacillus anthracis* (cultures only) *Brucella abortus* (cultures only) *Brucella melitensis* (cultures only) *Brucella suis* (cultures only) *Burkholderia mallei - Pseudomonas mallei* – Glanders (cultures only) *Burkholderia pseudomallei – Pseudomonas pseudomallei* (cultures only) *Chlamydia psittaci* - avian strains (cultures only) *Clostridium botulinum* (cultures only) *Coccidioides immitis* (cultures only) *Coxiella burnetii* (cultures only) Crimean-Congo hemorrhagic fever virus Dengue virus (cultures only) Eastern equine encephalitis virus (cultures only) *Escherichia coli*, verotoxigenic (cultures only) Ebola virus Flexal virus *Francisella tularensis* (cultures only) Guanarito virus Hantaan virus Hantaviruses causing haemorrhagic fever with renal syndrome Hendra virus Hepatitis B virus (cultures only) Herpes B virus (cultures only) Human immunodeficiency virus (cultures only) Highly pathogenic avian influenza virus (cultures only) Japanese Encephalitis virus (cultures only) Junin virus Kyasanur Forest disease virus Lassa virus Machupo virus Marburg virus Monkeypox virus *Mycobacterium tuberculosis* (cultures only) Nipah virus Omsk hemorrhagic fever virus Poliovirus (cultures only) Rabies virus (cultures only) *Rickettsia prowazekii* (cultures only) *Rickettsia rickettsii* (cultures only) Rift Valley fever virus (cultures only) Russian spring-summer encephalitis virus (cultures only) Sabia virus *Shigella dysenteriae* type 1 (cultures only) Tick-borne encephalitis virus (cultures only) Variola virus Venezuelan equine encephalitis virus (cultures only) West Nile virus (cultures only) Yellow fever virus (cultures only) *Yersinia pestis (cultures only)*

6.1.2 The indicative list of Category A agents affecting animals – UN2900

UN No. 2900 Infectious substances affecting animals only	African swine fever virus (cultures only) Avian paramyxovirus Type 1 – velogenic Newcastle disease virus (cultures only) Bluetongue virus **see note* Classical swine fever virus (cultures only) Foot and mouth disease virus (cultures only) Lumpy skin disease virus (cultures only) *Mycoplasma mycoides* - Contagious bovine pleuropneumonia (cultures only) Peste des petits ruminants virus (cultures only) Rinderpest virus (cultures only) Sheep-pox virus (cultures only) Goatpox virus (cultures only) Swine vesicular disease virus (cultures only) Vesicular stomatitis virus (cultures only)

6.1.3 Clinical material sourced from humans or animals

This includes blood, other body fluids, excreta, secreta, tissues or body fluids being transported for research or diagnostic purposes. Such material should be assigned to Category A or B depending on the known medical history or source of the material. For most clinical material, unless it is known or reasonably believed that the material contains Category A infectious substance e.g. a faecal sample from a patient being treated for typhoid, then such material should be classified as Category B infectious substance.

6.1.4 Exempt material

Specimens from humans or animals where there is minimal likelihood that pathogens are present are exempt from the regulations provided they are packaged in a way so as to prevent leakage during transport and labelled with the words EXEMPT HUMAN SPECIMEN or EXEMPT ANIMAL SPECIMEN. Such specimens would include blood or urine taken to monitor glucose, cholesterol or hormone levels. This category also includes tests to monitor organ function, drug monitoring or tests to determine the presence of drugs or alcohol. Professional judgement needs to be taken as to the likelihood of there being pathogens present, for example whether the material is sourced from an otherwise healthy population and that sample is not specifically being tested for the presence of an infectious disease.

6.1.5 Genetically modified organisms/micro-organisms (GMOs/GMMs)

Infectious GMMs: The GMM should first be assessed to see if it is capable of causing disease in humans or animals i.e. would work with the GMM in the laboratory mean that it is classified as being Class 2 or higher? If so, then it should be classified as Category A or B as appropriate.

Non-infectious GMMs to humans but capable of altering animals, plants or other micro-organisms in a way that does not occur naturally: e.g. GMMs that could be classified as Class 1 but which are vectors and can transfer genetic material to other organisms, are classified as Class 9 (Miscellaneous dangerous goods). They are assigned to UN 3245 and their proper shipping name is GENETICALLY MODIFIED MICRO-ORGANISMS.

Non-infectious GMMs that are not able to alter animals, plants or other micro-organisms: not considered hazardous for transport but they should be packaged in such a way so they do not leak during transport.

The transport of Genetically Modified material is not covered under these Guidance Notes. For information on the transport of Genetically Modified material see Guidance Notes on the Transport of GMOs/GMMs.

6.1.6 Naked DNA or proteins derived from GMMs

Such material e.g. plasmids, as well as non-modified proteins and other biological material generally, e.g. antibodies, are not considered hazardous for transport but such material should be packaged in such a way so they do not leak during transport. Depending on the source of the material, it may be subject to import/export control.

6.1.7 Other biological material

DNA which may not be classified as dangerous for the purposes of transport still needs to be sent in robust triple packaging so that it doesn't leak during transit and also be appropriately labelled so as to not to give rise to concerns as regards safety or security of the material.

6.1.8 Biological products

Biological products are defined as products derived from living organisms which are manufactured and distributed in accordance with the requirements of national authorities. One example of this is rabbit serum for antibiotic production. If such material is produced within the University and needs to be sent out, please contact the UBSA for further information.

6.1.9 Medical or clinical waste

Medical or clinical waste is defined as that derived from the medical treatment of animals or humans or the bio-research. However, all such waste generated within the University is transported for disposal by an external contractor in compliance with the relevant regulations and so is not considered further here.

6.1.10 Exemptions and exceptions

There are certain types of biological substances which fall outside scope of the regulatory regime because of the low hazard they present.

- Substances that do not contain infectious substances or substances which are unlikely to cause disease in humans or animals;
- Substances containing micro-organisms that are not pathogenic for humans or animals;
- Substances in a form where any pathogens present have been neutralised or inactivated;
- Environmental samples (including food and water) which are not considered to pose a significant risk of infection; and
- Dried blood spots collected by applying a drop of blood to absorbent material or faecal occult blood screening tests and blood or blood components collected for the purposes of transfusion or transplantation and any tissues or organs intended for use in transplantation.

Minimum packaging requirements for exempt substances can be found in Section 6.2.2.

6.2 Packaging, labelling and documentation

6.2.1 Packaging and labelling requirements for Category A and B substances

Each category of infectious substance should be packaged using the approved packaging material (packaging tested against specific criteria) and labelled in accordance with the relevant Packing Instruction along with relevant documentation. Packaging, labelling and documentation requirements are provided as part of the IATA training (see Section 8.1) and summarised as follows:

- UN3373 Category B Biological Substance: Packing Instruction PI650
- UN2814 Category A Infectious Substance affecting humans: Packing Instruction PI620/PI602
- UN2900 Category A Infectious Substance affecting animals: Packing Instruction PI620

The appropriate labelling including the UN number, proper shipping name, consignor/consignee details, emergency contact details and emergency response procedures may be required. Airway bills will be required for transport by air.

6.2.2 Packaging and labelling requirements for exempt human or animal specimens (no-hazardous biological specimens)

All biological substances, including those not classified for transport and exempt human and animal samples, must be packed using a triple layer system:

- **Primary receptacle** – a primary watertight, leak-proof (or sift-proof for solids) containing the infectious substance, packaged with enough absorbent material to absorb all fluid in case of breakage;
- **Secondary packaging** – a second durable, watertight, leak/sift-proof packaging to enclose and protect the primary receptacle(s). Several cushioned primary receptacles can be placed in one secondary packaging, but sufficient absorbent material should be used to absorb all fluid in case of breakage; and
- **Outer packaging –** secondary packaging is placed in an outer shipping packaging with suitable cushioning material. Outer packaging should protect contents from physical damage during transit.

Documentation for the transport of non-hazardous biological specimens is not specifically required but in order to address any issues arising in transport and to avoid any doubt about the low hazard associated with the contents, paperwork (ideally on University headed paper) should be included within the package between the secondary and the outer with details of who is sending the material and where they are going and the name and telephone number of a contact in case any checks are required. The paperwork should state simply the nature of the material, and that because it there is minimal likelihood that any pathogens are present, that the material is exempted from the dangerous goods regulations. In cases where the package will be going through customs, a statement should be added, where appropriate, that they are research materials of no commercial value.

6.3 Using refrigerants and preservatives to transport infectious substances

Infectious substances and other biological materials are often transported with another substance to stabilize/preserve them during the journey, e.g. at low temperatures or using certain chemicals. Use of these substances in the packaging of infectious substances must be carried out in accordance with the dangerous goods regulations.

6.3.1 Use of refrigerants

Ice or dry ice should be placed between the secondary and outer packaging. If ice is used, it should be placed in a leak-proof container and the outer packaging or overpack should also be leak-proof. Dry ice must not be placed inside either the primary or secondary receptacle because of the risk of explosion and the packaging (outer and/or overpack) must be designed to release CO_2. Dry ice is listed in the Dangerous Goods List and is classified in Class 9 (Miscellaneous dangerous goods) under UN 1845 CARBON DIOXIDE, SOLID. For transport by road, dry ice is not subject to the provisions of the transport regulations however if it is transported by air various requirements must be met.

An authorised IATA trained member of University staff must be consulted with to discuss the details of the hazard labelling, other marking and documentation required when using dry ice to ship infectious substances and other biological materials.

Use of liquid nitrogen requires specialised UN packaging and should only be used when no other alternative means of refrigeration is possible.

6.3.2 Use of chemicals

Some of the chemicals used during transport of infectious substances and other biological materials may also be hazardous as defined under the dangerous goods regulations. For example, both ethanol and formalin are flammable. However, use of these chemicals is permitted for clinical specimens and other Category B infectious substances being sent by road, rail or air if there is less than **30**mls of liquid in each primary receptacle. Provided the

infectious substance is packaged in accordance with the relevant Packing Instruction (PI650), no further hazard labels, other marking or special packaging is required.

6.4 Transport

Whatever means of transport is used the material must first be classified, packaged and labelled in accordance with the relevant requirements. Some dangerous goods couriers can also supply appropriate packaging (laboratory consumable suppliers may also supply or distribute packaging). You should note that since there is no specified packing for non-hazardous biological material or exempt material, if you decide to use a commercially sourced triple pack system intended for either Category A or B substances, you should remove or cover up any unnecessary hazard labelling to avoid any problems during the transport process.

6.4.1 Using couriers for air, road or rail

Before sending any infectious substances or other material containing dangerous goods, for example, sending non-hazardous biological material on dry ice, you should first check that the courier is able to handle dangerous goods. The courier may require you to use their own packaging and should also supply relevant transport documentation for completion, together with instructions for completion; they may ask for additional documentation to meet their own internal safety requirements. If the material is travelling by air, they should also be able to provide advice on any specific requirements of the airline used and/or the destination country. You will need to ensure you have completed any relevant import or export documentation that may be required. If you are using a courier to send your material within the UK, you need to check whether any stage of the journey will be undertaken by air so that you can make sure to use the correct classification, packaging, labelling and documentation.

6.4.2 Using the postal service – domestic and international

The Royal Mail sets out which types of dangerous goods cannot be sent by mail and others which are accepted on a limited basis.

- Category A infectious substances cannot be sent by domestic mail services but Category B infectious substances (UN 3373) are accepted by Royal Mail up to a limit of 50ml/50g per package, provided they are packaged and labelled in accordance with the regulations by an authorised IATA trained member of University staff. Royal Mail supplies their own commercially available packaging for use with material that is classified as UN 3373 (See Figure 1 below).
- Dry ice and frozen water **cannot** be sent with Category B infectious substances or other biological material sent via the domestic postal service.
- GMMs classified as UN 3245 and exempt human or animal specimens can be sent by domestic mail appropriately packaged and labelled.
- Material sent by the Royal Mail should be sent in accordance with air transport requirements as a proportion of all post in the UK will be carried by air at some point.

If you are planning research that requires participants to send you clinical samples e.g. urine, you should ensure that they are provided with appropriate packaging to return the samples to you if you use the postal service. Infectious substances cannot be sent overseas using the postal service.

Figure 1. Royal Mail Packaging.

6.4.3 Use of public and private transport

Category A infectious substances must not be transported on public transport or in your own vehicle as movement of such material requires other requirements of the carriage of dangerous goods regulations to be met, including vehicle placarding and formal driver training (certificate required).

Category B infectious substances and other biological material can be transported using private transport provided that the material is packaged and labelled and contains relevant documentation in accordance with the regulations. The use of private transport is not encouraged and should be approved by the HoD and DSC, and the substances must be packed in accordance with the regulations. The person transporting should undertake a full risk assessment to include: the use of certified packaging; relevant documentation; packaging; transport undertaken by a trained person (Class 6.2 Transport of Infectious Substances Training, see section 8); emergency procedures (including spill kit and relevant spillage training). Dry ice must not be transported by private vehicle.

Taxi services If using a taxi service e.g. to send urgent patient specimens from a hospital to a laboratory, the material should be packed using the triple pack system. The specimen should be placed in a leak-proof plastic bag (with absorbent material) and then placed in a rigid, lidded outer container – this outer container should also be appropriately labelled. The taxi driver should be informed that there is no risk to them if the package is not opened and that the material should be taken straight to its destination (without making any pick-ups on the journey). Please refer to the University Estates Services (Procurement) website for approved taxi services and couriers.

Infectious substances cannot be transported by air, either on your person, as hand luggage or checked in baggage.

6.4.4 Intra Campus transport

The Bio Transport Carrier below is highly recommended for all intra-campus transport of biological materials including GM material.

Figure 2. Bio Transport Carrier

This closed-system carrier is designed to protect the lab worker during transportation of vessels filled with potentially hazardous biological material. The box should offer excellent visibility of contents, be tough and break-resistant with easy-to-grasp side handles that are moulded in clamps to securely hold the carrier closed and assure a leak-proof seal. The box should be autoclavable. A written procedure for dealing with spillages and a spill kit should be available during transportation.

7. IMPORT AND EXPORT PROCEDURES

Movement of certain types of biological material into and out of the UK will require additional documentation, e.g. a licence to cover their import/export. An overview of some of the licencing requirements is provided below. Where additional advice is required the DBSC or the UBSA should be consulted with.

7.1 Importing and exporting human pathogens

There are no import requirements covering the movement of human pathogens into the UK, other than the need to notify HSE of the movement of a HG4 biological agent (either within the UK, or to cover movement from airport to laboratory if the agent is being sent from overseas).

Exportation of a human pathogen needs a licence if the pathogen is listed in UK/EC strategic export control lists and the pathogen is being exported to any destination outside of EU. Further information can be found on the government website '[Guidance on UK strategic export controls list]'.

7.2 Importing and exporting animal pathogens or carriers

Animal pathogens are defined as: any collection or culture of organisms or any derivative either on its own or in recombinant form of such a collection or culture of organisms which may cause disease in animals or poultry;

and carriers as: any living creature except man which may carry or transmit an animal pathogen or the tissue, cell culture, body fluid, excreta, carcase or part of a carcase of such creature by or by means of which an animal pathogen may be transmitted.

Animals are defined as: cattle, sheep, goats and all other ruminating animals, horses and swine and poultry as: domestic fowls, turkeys, geese, ducks, guinea-fowls, pigeons, pheasants, partridges and quail.

7.2.1 Outside of the EU

You must have an import licence to move non-specified animal pathogens or carriers into the UK from a non-EU state.

If importing an animal pathogen from outside of the EU into Scotland, a licence is required under the Importation of Animal Pathogens Order (IAPO) 1980. This legislation covers pathogens and carriers. This license can be obtained upon completion of an IV58 form the Scottish Government.

Although the licence should be issued within 15 days of application, it is advisable to apply at last 3 weeks in advance of the planned importation.

7.2.2 Within the EU

You must have a general licence to move non-specified animal pathogens or carriers into the UK from an EU member state.

If importing an animal pathogen from within EU (or transfer in UK), a licence may be needed under Specified Animal Pathogens Order (SAPO) 1998 before premises can hold/use certain specified pathogens or carriers.

Certain animal pathogens are listed in UK/EC strategic export control lists and will require an export licence before sending outside the EC. Further information can be found on the government website '[Guidance on UK strategic export controls list]'.

7.3 Importing and exporting GMMs

Under the Cartagena Protocol on Biosafety (the first Protocol to the Convention on Biodiversity) GMMs destined for Contained Use are excluded from the majority of the requirements of the protocol, e.g. advanced informed agreement arrangements, as this is meant primarily for organisms destined for deliberate release. However, when exporting GMOs/GMMs for contained use, it is necessary to:

- Ensure the GMOs/GMMs are transported safely - the GMOs/GMMs must be classified, packaged and labelled in accordance with the relevant transport regulations;
- Provide certain information in accompanying documentation - some of the information required for example, contact details for further information and the name and address of the person to whom the consignment is being sent, is already included in paperwork necessary to comply with the transport regulations; and
- Provide additional information as follows - a statement that the package contains or consists or GMMs giving a basic description of the host and how it has been modified, any unique identification code(s) assigned to the GMMs if such codes exist and any requirements for safe handling, storage, transport and use. This can be achieved by enclosing a copy of relevant parts of the GM risk assessment. However, you should note you must make an explicit statement that the package contains GMMs and not just assume it is implicit by providing a copy of the GM risk assessment.

The HSE must be informed (as part of the notification process for Class 3 activities) whether Class 3 GMMs are likely to be subject to any movement entering or leaving the EC. HSE then informs the Biological Clearing House and European Commission of such movements.

8. TRAINING

8.1 IATA training

When transporting Infectious Substances by air, it is a legal requirement that personnel who package and arrange for air transport by courier must be trained under the condition set out in The *Technical Instructions for the Safe Transport of Dangerous Goods by Air*, further information can be obtained from SHaW.

The training needs of each individual should be identified according to a Departmental training matrix. The checklist forming part of the Occupational Health and Safety Induction - Part 2 can be utilised to establish initial training and specific training can be identified and fulfilled as required.

8.2 Other training

See Section 6.1 and Section 6.5 of the OHS Biological Safety Standard for training requirements for working with biological material.

9. EMERGENCY RESPONSE PROCEDURES

The following information should be included in the packaging of biological materials classified as UN 2814, 2900, 3373 and 3245. This enables carriers, operators and others to respond appropriately in the event of a spillage. Clean-up or disposal should only be carried out by a competent person.

9.1 Mitigation Procedures

- Isolate spill or leak area immediately in all directions and keep unauthorised personnel away;
- Obtain identity of substance involved if possible and report the spill to the appropriate authorities;
- Do not touch or walk through spilled material;
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing;
- Be particularly careful to avoid contact with broken glass or sharp objects that may cause cuts or abrasions that could significantly increase the risk of exposure;
- Damaged packages containing solid CO_2 as a refrigerant may produce water or frost from condensation of air. Do not touch this liquid as it could be contaminated by the contents of the package;
- Liquid nitrogen may be present and can cause severe burns; and
- Absorb spilled materials with earth, sand or other non-combustible material while avoiding direct contact. Cover damaged package or spilled material with damp towel or rag and keep wet with liquid bleach or other disinfectant. Liquid bleach will generally effectively inactivate the released substance.

9.2 First Aid

- Move exposed person(s) to a safe isolated area and remove and isolate contaminated clothing and shoes - CAUTION: Exposed person(s) may be a source of contamination;
- Call emergency medical services and for further assistance, contact the appropriate public health authority;
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes;
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
- Ensure that medical personnel are aware of the substances involved, and take precautions to protect themselves; and
- If appropriate, report the accident or incident to the appropriate authorities.

10. EXAMPLE CLASSIFICATIONS OF INFECTIOUS SUBSTANCES AND OTHER BIOLOGICAL MATERIAL

10.1 Unscreened blood sample taken from a patient from population with a high prevalence

This should be assigned to Category B–UN 3373: Biological substance. Although the material has not been screened, it could contain HIV and other blood-borne viruses e.g. hepatitis B. Although HIV and HBV appear on the indicative list for Category A pathogens, this is for cultures only. Clinical material which may contain these pathogens does not meet the criteria for inclusion in Category A for any other reason, and so Category B should be used. If blood is taken from a population which is otherwise healthy and where you have no reason to suspect that the individuals are suffering from an infectious disease and you are not taking the sample for the purpose of testing or diagnosing an infectious disease, you could classify this material as an “Exempt human (or animal) specimen” but if you are not sure you should use UN 3373 as a precaution.

10.2 E. coli K-12 containing a modified plasmid that carries cloned genes of unknown potential to modify other micro-organisms

This should be assigned to Class 9 –UN 3245: Genetically Modified Micro- organisms. The agent does not cause disease in humans or animals, and so does not meet the criteria for an infectious substance. But it could be capable of transforming other micro-organisms and so should be assigned to Class 9.

10.3 Culture of Mycoplasma mycoides sub species mycoides containing a non-mobilisable, non-transmissible plasmid carrying an insert coding for GFP

This should be assigned to Category A –UN 2900: Infectious substance affecting animals only. Although this agent is modified, its infectious properties must be considered first and, as such, are the most hazardous, so the agent, must be classified as a Category A substance. This is an animal pathogen, but not zoonotic so UN 2900 is used.

10.4 Water samples collected for chemical analysis

These samples are outside the scope of the regulations for the purpose of transport as the risk of infection associated with such material is so low; although they may contain infectious agents they are likely to be at very low concentrations and so not pose a risk. However, if samples were taken from say an environment where there had been an outbreak of a water-borne disease e.g. Giardia, consideration should be given to classifying the material as UN 3373. Although outside scope of the regulations, the packaging used should still be fit for purpose i.e. robust, so that the samples survive the transport process

11. FURTHER INFORMATION AND GUIDANCE

- Transport of Infectious Substances, A guidance document produced by the Department for Transport, the Civil Aviation Authority and the Maritime and Coastguard Agency available from Department of Transport website.
- HSE Guidance on Transportation of Infectious Substances available from the HSE website.
- IATA Guidance - http://www.iata.org/whatwedo/cargo/dgr/Pages/index.aspx.