Schedule of Aircraft Disinsection Procedures

New Zealand MAF Quarantine Service (MQS)

and

Australian Quarantine and Inspection Service (AQIS)

30 September 2008

Australian Government

Australian Quarantine and Inspection Service

MAF

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1 INTRODUCTION

This is a joint document between the New Zealand Ministry for Agriculture and Forestry (MAF) Quarantine Service (MQS) and the Australian Quarantine and Inspection Service (AQIS) for the control of aircraft disinsection arrangements of aircraft flying into New Zealand and Australia.

MQS and AQIS are working in partnership and will authorise on behalf of each other all disinsection Compliance Agreements and any other undertakings as required.

1.1 LEGISLATIVE AUTHORITY

The New Zealand *Biosecurity Act 1993* and Regulation 23 of the Australian *Quarantine Regulations 2000* states that the master of an aircraft, or, if the master is not the operator of the aircraft, the operator of the aircraft, must make arrangements for the treatment of the aircraft in a manner approved by the Director of Quarantine for the purpose of destroying insects and disease vectors.

1.2 GENERAL CONDITIONS

This schedule is issued as a guide to enable airline personnel to develop detailed procedures, which are appropriate for their aircraft and operational methods, for destroying pest and disease vectors.

1.3 JUSTIFICATION

The reason for disinsection of international aircraft is to help protect New Zealand and Australia from a range of vectors of human diseases, and pests of animal and plant quarantine concern entering New Zealand and Australia. Surveys have conclusively shown that such pests can be, and are, present in international aircraft and disease outbreaks have been traced to this source. The approved sprays target both soft and hard bodied pests.

The following procedures outline the responsibilities and functions of airlines in relation to cabin and hold disinsection of aircraft entering New Zealand and Australian airports from overseas.

1.4 APPROVED CABIN DISINSECTION METHODS

1.4.1 Residual

The residual treatment of all areas as applied in accordance with the requirements of Section 4 of this document. Approval of this method is subject to negotiation of satisfactory Compliance Agreement audit arrangements with either MQS/AQIS.

1.4.2 Pre-embarkation

The Pre-flight spraying of the flight deck, toilet areas, overhead and coat lockers, galley and crew rest areas and cabin using a disinsection formula with a residual capability at the last port before entering Australia or New Zealand. Approval of this method is subject to negotiation of satisfactory Compliance Agreement audit arrangements with either MQS/AQIS.

1.4.3 Top of Descent

Top of Descent disinsection refers to a two-part process consisting of Pre-flight and Top of Descent disinsection spraying.

This involves Pre-flight spraying of the flight deck, toilet areas, overhead and coat lockers, galley and crew rest areas using a disinsection formula with a residual capability at the last port before entering Australia or New Zealand. Top of Descent spraying of passenger cabins is completed using a disinsection formula with knock down capabilities.

Approval for this method is subject to negotiation of satisfactory Compliance Agreement audit arrangements with either MQS/AQIS.

1.4.4 On Arrival

Aircraft not disinsected or not disinsected correctly by the Residual, Top of Descent or Pre-embarkation methods and/or without a valid Disinsection Certificate must be disinsected on arrival under the supervision of either an MQS/AQIS Inspector.

1.5 APPROVED HOLD DISINSECTION METHODS

1.5.1 Residual

All holds that are intended to be residually must be treated in accordance with section 4 of this document. As with cabin area residual treatment arrangements, approval of this method is subject to negotiation of satisfactory Compliance Agreement audit arrangements with either MQS/AQIS.

1.5.2 Pre-flight

The spraying of holds manually, as per section 8 of this document, prior to departure from the last port before entering New Zealand or Australia.

2 AUTHORISATION

Written permission may be given to a company to carry out any number of the approved disinsection methods (Cabins: Residual, Pre-embarkation, or Top of Descent; Holds: Residual or Pre-flight). Approval is subject to Compliance Agreement arrangements negotiated with either MQS/AQIS after due consideration of the process submitted by that company and assessment of the process being carried out.

3 COMPLIANCE MONITORING OF DISINSECTION METHODS

3.1 RESIDUAL

The compliance monitoring procedure will involve observations of the airline operator or a third party provider completing the residual treatment being applied as per section 4 of this document. The applicator must be approved by either MQS/AQIS. Periodic checks of the documentation associated with staff training and formal procedures will also be undertaken. Monitoring will also include bioassay testing as per Appendix 1. Monitoring frequency will be at intervals as outlined in a Compliance Agreement between the airline operator and either MQS/AQIS. Trained MQS/AQIS officers must carry out compliance monitoring.

Note: Sanctions for non-compliance must be applied as set out in the flow chart at Appendix 3.

3.2 PRE EMBARKATION

The compliance monitoring procedure will be based on observations of the applicator completing the Pre-flight Disinsection techniques. Trained MQS/AQIS officers must carry out compliance monitoring. The applicator must be approved by either MQS/AQIS. Periodic checks of the documentation associated with staff training and formal procedures will also be undertaken. Monitoring frequency must be at intervals as outlined in a Compliance Agreement between the airline operator and either MQS/AQIS.

Note: Sanctions for non-compliance will be applied as set out in the flow chart at Appendix 3.

3.3 TOP OF DESCENT

The compliance monitoring procedure will be based on observations of the applicator completing the pre-flight and in-flight disinsection techniques. Trained MQS/AQIS officers must carry out compliance monitoring. The applicator must be approved by either MQS/AQIS. Periodic checks of the documentation associated with staff training and formal procedures will also be undertaken. Monitoring frequency will be at intervals as outlined in a Compliance Agreement between the airline operator and either MQS/AQIS.

Note: Sanctions for non-compliance will be applied as set out in the flow chart at Appendix 3.

3.4 HOLDS

The compliance monitoring procedure will be based on observations by MQS/AQIS inspectors of the applicator completing Hold Disinsection procedures. The applicator must be approved by either MQS/AQIS. Periodic checks of the documentation associated with staff training and formal procedures will also be undertaken. Monitoring frequency will be at intervals as agreed in a Compliance Agreement between the airline operator and either MQS/AQIS. The applicator must require either MQS/AQIS approval.

For freighter aircraft operators with no approved cabin disinsection being undertaken, the Hold Disinsection applicator will be monitored for compliance at intervals as outlined in a Compliance Agreement between the airline operator and either MQS/AQIS. The applicator must require either MQS/AQIS approval.

Note: Sanctions for non-compliance will be applied as set out in the flow chart at Appendix 3.

4 RESIDUAL CABIN AND HOLD DISINSECTION

Residual Disinsection of aircraft cabin and hold areas, including flight decks, toilet and locker areas etc, may be approved subject to Compliance Agreement arrangements negotiated between either MQS/AQIS and respective airlines to ensure correct procedures are in place. These arrangements include the requirement for airlines to update the Aircraft Disinsection Information (ADI) database, which lists the treated aircraft and treatment expiry dates to facilitate quarantine clearance on arrival. Aircraft so treated must be issued with a Certificate of Residual Disinsection (Appendix 4C for example), which must be carried on board the aircraft.

4.1 FORMULATION

The formulation used for residual spraying is a 2% emulsion of the active ingredient permethrin, 25/75 cis-trans ratio. This can be prepared by mixing 2 parts of 85% emulsifiable concentrate (EC) in 83 parts of distilled water or 2 parts of 50% EC in 48 parts of distilled water.

Note: Wettable powders and suspension concentrates cannot be substituted for the emulsifiable concentrate.

4.2 QUANTITIES

The following approximate quantities will be needed to treat the interior surfaces of both cabin and cargo compartments depending on the aircraft series:

B747	33 litres	A330/340	18 litres
B767/A310	12 litres	B777	19 litres
DC10	16 litres	B737	7 litres
B727 Freighter	6 litres		

For other aircraft types please contact either MQS/AQIS for quantities required.

4.3 MEANS OF APPLICATION

Residual Disinsection must only be applied by organisations approved by either AQIS/MQS. A list of the currently approved organisations for Residual Disinsection is attached at Appendix 5.

Suggested means of application is by compressed air spray guns, fogging apparatus or pressure-retaining sprayers. MQS/AQIS approved aerosols can be used to spray electrically sensitive areas and cockpits (2% permethrin).

4.4 APPLICATION RATES

The required dosage rate is 0.2 g of permethrin per square metre on the interior surfaces except the carpets and cargo hold floor, which require 0.5 g of permethrin per square metre. The settling properties of the disinsection product results in an average floor insecticide concentration of 0.5 g/m^2. The aim is to achieve an even pattern of close droplets on **all** surfaces, not necessarily to achieve total cover, and certainly not to produce run off.

4.5 VARIATIONS TO APPLICATION RATES

Changes to the method of application rates must be approved by either MQS/AQIS.

4.6 TREATMENT PROCEDURES

Interior Surfaces - prepare the aircraft by opening, clearing and cleaning all lockers, cupboards, storage units etc and drawing all curtains and window blinds. Remove carpet covers if present. Spray all surfaces including ceilings, walls, lockers, curtains, toilets, flight deck, galleys and wall areas behind curtains. Spray both sides of doors and locker lids.

Areas receiving repeated substantial cleaning require immediate permethrin aerosol “touch up” spraying. This includes areas where cleaning is considered to have removed the insecticide film, e.g. bulkhead edges, locker lids, toilets, galleys, i.e. “fingerprint” areas.

Replacement of carpet sections or aircraft reconfiguration involving the removal or addition of walls and seats will necessitate a re-treatment of these areas.

However, interior cleaning and soiled item replacement of a relatively minor nature at stations other than the treatment station is considered negligible in the overall context of the program, and will not require re-treatment.

Cargo Compartments - Spray compartment walls, ceilings and floors. Pay particular attention to sidewall and floor cavities.

4.7 TREATMENT INTERVALS

Treatment must be at intervals not greater than eight weeks. If treatment is unable to be scheduled to meet the certification requirements, or if the level of cleaning has removed the residual insecticide film to a greater extent than can be replaced prior to arrival into Australia or New Zealand, the Certificate of Residual Disinsection will be deemed invalid.

4.8 SUPERVISION AND CERTIFICATION

The treatment must be carried out by or arranged by the aircraft operator or their agent in accordance with the provisions of a Residual Disinsection Compliance Agreement entered into by the aircraft operator with either MQS/AQIS. (MQS/AQIS will also maintain the right to monitor for efficacy).

Certificates of Residual Disinsection shall only be issued by organisations authorised by the relevant National Manager (MQS/AQIS). Airline operators are responsible for up dating the **Aircraft Disinsection Information (ADI) database**, which lists the treated aircraft and treatment expiry dates to facilitate quarantine clearance on arrival. If an AQIS quarantine officer is required to attend an aircraft on arrival because the expiry date on ADI has passed, a standard fee for service will be charged to the airline.

All residually treated aircraft must carry certification attesting to treatment for examination on request by either MQS/AQIS staff. (It is suggested that the certificate or a copy of it be displayed close to the main entry door or made available by cabin staff on request).

The minimum requirements for certification are attached in Appendices.

5 PRE-EMBARKATION CABIN DISINSECTION

5.1 GENERAL

Pre-embarkation cabin disinsection is the most recently developed method of aircraft cabin disinsection, and provides for the spraying of aircraft cabins in the absence of passengers and crew, before embarkation. This method not only kills invertebrates that may be present in the cabin at the time of disinsection, but also leaves a minimal but effective amount of residue which is likely to kill invertebrates that can get on board between the time of disinsection and departure.

Airlines may only undertake Pre-embarkation Disinsection of their aircraft after they have entered into a Compliance Agreement with either AQIS/MQS. This process involves, among other things, training of staff and verification that the process is being undertaken correctly.

5.2 TREATMENT PROCEDURES

Only approved and trained staff from an authorised organisation can carry out disinsection procedures. A list of the organisations currently approved by either MQS/AQIS that may undertake Pre-embarkation disinsection is attached as Appendix 6.

Pre-embarkation cabin disinsection is to be carried out at the last airport before departure to New Zealand and/or Australia and prior to occupancy by passengers.

The aircraft must be fully catered and the service doors closed. The main entry door may remain **open**.

The Pre-embarkation spray must be applied to the flight deck, all toilet areas (including upper deck where applicable), overhead and coat lockers, and galley and crew rest areas. Overhead and side wall lockers are to be open during the treatment.

Spraying must be completed using either an MQS/AQIS approved aerosol with 2% permethrin as the active ingredient.

Currently the only MQS/AQIS approved disinsection aerosols for quarantine purposes are manufactured by:

- Arandee Industries, Auckland, New Zealand; or
- Callington Haven, Sydney, Australia; or
- PSA (Products Sanitaire Aeronefs), France.

The propellant must be either Australian National Registration Authority or New Zealand Ministry for the Environment approved for use as a propellant in the disinsection of aircraft cabins.

(Approved propellants are HFC134a or mixtures of 134a and HCFC 141b).

All spray cans must conform to the Australian Standard AS2278.

The aerosol must comply with the following physical requirements in relation to droplet size:

(a) Not more than 20% by weight of the aerosol must consist of droplets of a diameter greater than 30um; or

(b) Not more than 1% by weight of the aerosol must consist of droplets of a diameter greater than 50um.

The nozzle emission rate must be 1 gram of aerosol per second and must evenly distribute approximately 10 grams of aerosol product per 28.3 cubic metres (1,000 cu ft) of cabin space.

During disinsection and for a period of 5 minutes after the completion of the spray, the aircraft's air-conditioning must be switched off. Recirculation fans may be left on if essential to the operation of the aircraft but set at the lowest flow rate.

Pre-embarkation cabin disinsection procedures are as follows for the following aircraft. Procedures for other aircraft types must be confirmed with either AQIS/MQS.

Boeing 747-400

All toilets and lockers are sprayed for 2 seconds each, crew rest area and flight deck for 3 seconds each.

Downstairs: 2 operators each with 2 cans starting at the rear of the aircraft and moving forward at a rate of not more than 1 step or 1 row of seats per second, with the spray being directed towards the open overhead lockers.

Upstairs: 1 operator using the remaining spray from all 4 cans with all lockers opened and moving at 1 step per second with 2 cans at a time.

In this case a Boeing 747-400 would require the use of 4 x 100gm cans.

(Note: B747 Combi has the rear portion of the main cabin as a cargo area. This can be accessed via a door at the end of the main cabin and sprayed using 1 hold spray aerosol).

B767-300

All toilets and lockers are sprayed for 2 seconds each, crew rest area and flight deck for 3 seconds each.

1 operator with 2 cans sprays up 1 aisle and down the other at a rate of not more than 1 step or 1 row of seats per second, with the spray being directed towards the open overhead lockers.

In this case a Boeing 767-300 would require the use of 2 x 100gm cans.

The amount of spray required for each aircraft type is listed in Appendix 2.

5.3 CERTIFICATION

The minimum requirements for certification are attached in Appendices.

5.4 CONTINGENCIES

If an aircraft is not "off blocks" within 60 minutes of the Pre-embarkation Disinsection spraying procedure and passengers have been required to disembark within this period then the application and certificate is null and void. The aircraft will either have to be sprayed again following the same procedure or revert to On Arrival spraying.

Any non-conformance in procedures should be reported to the airport of destination as soon as is possible.

6 TOP OF DESCENT CABIN DISINSECTION

6.1 TREATMENT PROCEDURES

Only approved and trained staff from an authorised organisation can carry out the procedures. A list of the currently approved organisations that may undertake Top of Descent cabin disinsection is attached as Appendix 7.

6.1.1 Pre-flight Spraying

Top of Descent disinsection refers to a two-part process consisting of Pre-flight and Top of Descent disinsection spraying.

The Pre-flight procedures must be carried out prior to passenger embarkation at the last airport prior to departure for Australia or New Zealand and must be completed up to 1 hour before departure after catering has been completed.

A Pre-flight spray must be applied to the flight deck, all toilet areas (including upper deck where applicable), overhead and coat lockers, and galley and crew rest areas before passengers board. Overhead and side wall lockers must be **open** during the treatment.

Spraying must be completed using an MQS/AQIS approved aerosol with 2% permethrin as the active ingredient.

The propellant must be either Australian National Registration Authority or New Zealand Ministry for the Environment approved, for use as a propellant in the disinsection of aircraft cabins.

(Approved propellants are HFC134a or mixtures of 134a and HCFC 141b).

All spray cans must conform to the Australian Standard AS2278.

Currently the only MQS/AQIS approved disinsection spray aerosols for quarantine purposes are manufactured by:

- Arandee Industries, Auckland, New Zealand;
- Callington Haven, Sydney, Australia; and
- PSA (Products Sanitaire Aeronefs), France.

Spraying equating to a rate of 10gms per 1000 cubic feet or 10gms per 28.3 cubic metres must be carried out.

Pre-flight cabin disinsection procedures are as follows for the following aircraft. Procedures for other aircraft types must be confirmed with AQIS/MQS.

B747-400

All toilets and lockers are sprayed for 2 seconds each, crew rest area and flight deck for 3 seconds each. Downstairs: 2 operators each with 2 cans starting at the rear of the aircraft and moving forward at a rate of not more than 1 step or 1 row of seats per second, with the spray being directed towards the **open** overhead lockers.

Upstairs: 1 operator using the remaining spray from all 4 cans with all lockers opened and moving at 1 step per second with 2 cans at a time.

In this case a Boeing 747-400 would require the use of 4 x 100gm cans.

B767-300

All toilets and lockers are sprayed for 2 seconds each, crew rest area and flight deck for 3 seconds each.

1 operator with 2 cans sprays up 1 aisle and down the other at a rate of not more than 1 step or 1 row of seats per second, with the spray being directed towards the **open** overhead lockers.

In this case a Boeing 767-300 would require the use of 2 x 100gm cans.

The amount of spray required for each aircraft type is listed in Appendix 2.

6.1.2 Top of Descent Spray

Top of Descent disinsection spray must be applied immediately prior to commencing it's descent to the airport of arrival in New Zealand or Australia.

The AQIS in-flight announcement should be made to inform the passengers of the upcoming disinsection. This announcement and its delivery are covered in Top of Descent Compliance Agreements between airline operators and either MQS/AQIS.

AQIS IN-FLIGHT ANNOUNCEMENT:

> "Ladies and Gentlemen, to conform with animal, plant quarantine and health requirements, the aircraft cabin will now be sprayed. This procedure, using a spray recommended for this purpose by the World Health Organisation, is necessary to prevent the introduction of harmful pests into New Zealand/Australia. Please remain seated and keep the aisles clear while the aircraft is being sprayed. Thank you."

Spraying must be completed using an MQS/AQIS approved aerosol with 2% d-phenothrin as the active ingredient.

Currently the only MQS/AQIS approved aerosols for quarantine purposes are manufactured by:

- Arandee Industries, Auckland, New Zealand;
- Callington Haven, Sydney, Australia; and
- PSA (Products Sanitaire Aeronefs), France.

The propellant must be either Australian National Registration Authority or New Zealand Ministry for the Environment approved, for use as a propellant in the disinsection of aircraft cabins.

(Approved propellants are HFC134a or mixtures of 134a and HCFC 141b).

All spray cans must conform to the Australian Standard AS2278.

Spraying, equating to a rate of 10gms per 1000 cubic feet or 10gms per 28.3 cubic metres must be carried out.

The airline staff must direct the spray cans towards the **closed** overhead lockers and walk through the cabin at a rate of not more than 1 row of seats or 1 step per second.

Double aisle aircraft - 2 airline staff/inspectors with 2 cans of spray each.

(Note: B747 Combi has the rear portion of the main cabin as a cargo area. This can be accessed via a door at the end of the main cabin and sprayed using 1 hold spray aerosol).

Top of Descent cabin disinsection procedures are as follows for the following aircraft. Procedures for other aircraft types must be confirmed with AQIS/MQS.

B747-400

Downstairs: 2 operators each with 2 cans starting at the rear of the aircraft and moving forward at a rate of not more than 1 step or 1 row of seats per second with the cans directed towards the **closed** overhead lockers.

Upstairs: 1 operator using the remaining spray from all 4 cans moving at 1 step per second with 2 cans at a time.

In this case a Boeing 747-400 would require the use of 4 x 100gm cans.

B767-300

1 operator with 2 cans sprays up 1 aisle and down the other at a rate of not more than 1 step or 1 row of seats per second, with the spray being directed towards the **closed** overhead lockers.

In this case a Boeing 767-300 would require the use of 2 x 100gm cans.

The amount of spray required for each aircraft type is listed in the schedule Appendix 2.

6.2 CERTIFICATION

The minimum requirements for certification are attached in Appendices.

7 ON ARRIVAL CABIN DISINSECTION

Any aircraft arriving that has not been disinsected or not disinsected correctly by Residual, Top of Descent or Pre-embarkation methods or without a valid Disinsection Certificate must be disinsected on its arrival under the supervision of either a MQS/AQIS Inspector as follows.

7.1 TREATMENT PROCEDURES

Once the aircraft has come to rest and the door is opened, the Inspector(s) must enter and have the door closed behind them. All external apertures are to remain closed including external air conditioning vents for the duration of the spraying. Once spraying is completed under the supervision of an Inspector(s), a period of 5 minutes must be observed to allow saturation of the insecticide before any doors or vents are opened.

Spraying must be completed using an MQS/AQIS approved aerosol with 2% d-phenothrin as the active ingredient.

Currently the only MQS/AQIS approved aerosols for quarantine purposes are manufactured by:

- Arandee Industries, Auckland, New Zealand;
- Callington Haven, Sydney, Australia; and
- PSA (Products Sanitaire Aeronefs), France.

The propellant must be either Australian National Registration Authority or New Zealand Ministry for the Environment approved, for use as a propellant in the disinsection of aircraft cabins.

(Approved propellants are HFC134a or mixtures of 134a and HCFC 141b).

All spray cans must conform to the Australian Standard AS2278.

Spraying equating to a rate of 10gms per 1000 cubic feet or 10gms per 28.3 cubic metres must be carried out.

Either airline staff or MQS Inspectors must direct the spray cans towards the **opened** overhead lockers and walk through the cabin at a rate of not more than 1 row of seats or 1 step per second.

All toilets and lockers must be sprayed for 2 seconds each; crew rest area and flight deck 3 seconds each.

The amount of spray required for each aircraft type is listed in Appendix 2 (Pre-embarkation amount).

8 HOLD DISINSECTION (Other than Residual)

All aircraft (except those that are residually treated) are required to have their holds disinsected either on arrival or in the previous port before entering New Zealand or Australia. Only approved and trained staff from an authorised organisation can carry out the procedure. A list of the currently approved organisations that may undertake hold disinsection is attached as Appendix 8.

8.1 TREATMENT PROCEDURES

Spraying must be completed using an MQS/AQIS approved aerosol containing 2% permethrin and 2% d-phenothrin as the active ingredients.

Currently the only approved MQS/AQIS aerosols for quarantine purposes are manufactured by:

- Arandee Industries, Auckland, New Zealand;
- Callington Haven, Sydney, Australia; and
- PSA (Products Sanitaire Aeronefs), France.

The propellant must be either Australian National Registration Authority or New Zealand Ministry for the Environment approved, for use as a propellant in the disinsection of aircraft cabins.

(Approved propellants are HFC134a or mixtures of 134a and HCFC 141b).

Spraying of holds must be carried out at 10gm per 1000 cubic feet or 10gms per 28.3 cubic metres.

The aerosol composition must be clearly shown on the label. It is a requirement that the aerosol must be dispersed at a rate of 3-4g/sec., utilising horizontal or vertical ejection nozzles.

All spray cans must conform to the Australian Standard AS2278.

8.1.1 Last Overseas Port

Spraying may be carried out manually at the last overseas port after all cargo has been loaded and immediately before closing the hold doors for departure.

In the case of aircraft that have two or more holds, 1 or 2 x 150g cans (depending on aircraft type, refer Appendix 2) must be discharged into each hold in such a manner as to ensure that all parts of the holds have been disinsected.

Some very small aircraft such as executive jets and smaller regular airline aircraft will require discretionary judgement, but obviously relatively small amounts of spray will be necessary.

The amount of spray required for each aircraft type is listed in Appendix 2.

8.1.2 On Arrival

Under no circumstances should a hold door be opened without the presence or approval of either an MQS or AQIS Inspector.

The MQS/AQIS Inspector will permit the hold to be unloaded only after sighting a completed Aircraft Hold Disinsection Certificate (Appendix 4D).

When satisfied that the procedure has been carried out, the MQS/AQIS Inspector will permit the baggage and cargo in the hold to be unloaded.

In the event that the certificate cannot be located or was not completed correctly, the hold must be manually disinsected by airline or ground-handling staff under the supervision of either an MQS/AQIS Inspector, using the hold spray formula (see 8.1), with an aerosol approved for use in aircraft disinsection.

8.2 CERTIFICATION

The minimum requirements for certification are attached in Appendices.

APPENDIX 1: Bioassay Audit Procedures

BIOASSAY AUDIT PROCEDURES for RESIDUALLY TREATED AIRCRAFT

1) Flies and test cages

- The flies to be used for bioassays are house flies (*Musca domestica*), which should be sourced from a convenient laboratory and placed in a meshed rearing cage (Fig 1). The rearing cage should be set up in an isolated room that is not exposed to insecticides or other chemical treatments.

- Inside the cage, the flies need access to moisture (cotton wool wads, or dental rolls, soaked in sugar water) and food (dry sugar crystals).

- Often the house flies are sold as pupae (for ease of transport) or newly hatched adults. It is important that they are of a susceptible (non-resistant) strain. Once flies have emerged and their cuticles have hardened, they are ready for bioassay testing. This usually takes 72 hours.

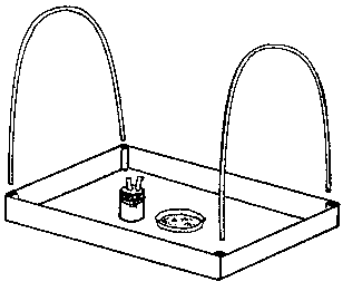
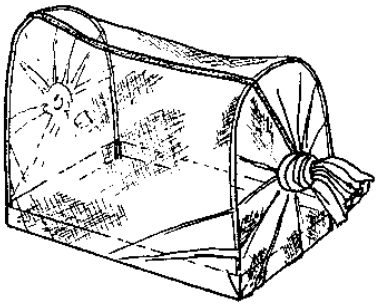


Fig. 1



- The test cages are made from round, plastic petri dishes, with a diameter of 100 mm. The lids of the petri dishes have their edge partially (for about 60% of the circumference) cut away with a hot knife or scalpel blade; when this is done smoothly, the actual test cage (the bottom part of the petri dish) can be easily slid off its lid (Fig 2), whereby the flies become exposed to the treated surface of the aircraft interior. After exposure time has elapsed it is relatively easy to carefully slide the lid back on to the test cage.

- For extra comfort of the test flies, and to allow air replacement inside the test cages, a patch of fine gauze netting can be "chemically glued" (use ethyl acetate to bond the plastic with the netting) onto the top of the cage, but this is not essential for the bioassay of residually treated surfaces.

- The test cages can be held together with rubber bands, keeping the lids securely on the bottoms.

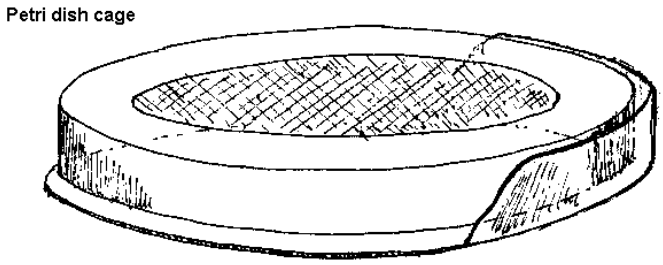


Fig. 2

2) Transferring flies from rearing cage to test cages

- Carefully transfer at least 100 flies from the rearing cage into a large, clean plastic bag. This may be more easily done as two lots of 50 flies. The mouth of the bag should be placed over the loose open end of the cage mesh. Flies are attracted to light and, consequently, if the plastic bag is place between the rearing cage and a window or light source the flies will move into the bag at a faster rate. (Fig. 3).

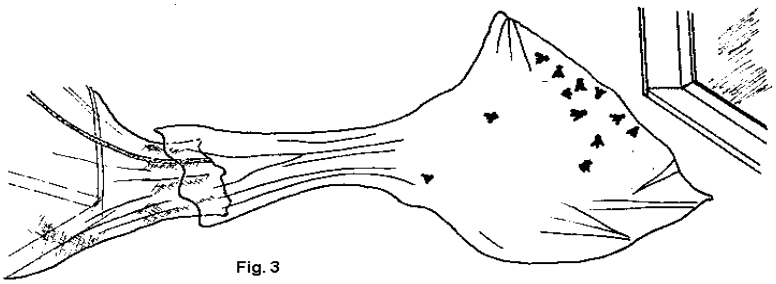


Fig. 3

- The test flies inside the plastic bag should then be subdued or anaesthetised in one of two ways. Either place them in a freezer for 3-5 minutes to knock them down, or expose them to a stream of carbon dioxide from a regulated cylinder. Care must be taken not to damage the flies either by over exposure in a freezer or by too much carbon dioxide.

- Gently place or tip 10 flies into each of the eleven test cages; replace the lids before the flies recover, and secure with rubber bands. Number the cages ("1" to "10" plus one "Control") and record the health status (Table 1) of the flies once they have recovered from being anaesthetised.

- The test cages should then be placed inside a small insulated, but not cooled, container (“esky” or “chilly bin”) ready for transporting to the test aircraft. The "Control" cage should be placed inside a clean semi-inflated plastic bag and secured with a rubber band.

3) Placement of test cages

- The 10 numbered cages are to be placed in the pre-determined positions described below. Hold the cage on the surface to be tested, take off the rubber band and slide the lid away from under the cage so that the flies becomes exposed to the aircraft's surface.

- For vertical surfaces and ceilings, the cages can be secured with "blu tack" or an adhesive tape that does not leave sticky residue on the aircraft's surface after removal. The lids should be placed inside a clean plastic bag and stored until the exposure period has ended.

- The pre-determined positions for the test cages are as follows:

  Cages # 1, # 2, and #3: on the floor - in front of a (window) seat.
  These cages will monitor the important permethrin deposits on the floor surfaces.

  Cage # 4: on a vertical wall - above or below window level.
  These will monitor the permethrin deposits on the vertical surfaces.

  Cages # 5 and # 6: on the ceiling - above the aisles.
  To monitor the ceiling deposits.

  Cage # 7: on the horizontal base, inside a locker.
  This checks if lockers were opened during Residual Disinsection spray

  Cage # 8: on a vertical bulkhead wall.
  This will also contribute to our knowledge of residue on vertical surfaces.

  Cage # 9: on the outside of a closed lid of an overhead locker.
  Monitors locker lid residue, and the regular aerosol "touch-up" sprays.

  Cage # 10: on a vertical wall inside a toilet
  This also checks on "touch-up" spray routine.

  "Control" Cage to be kept inside a clean plastic bag, away from any insecticide residues, for the duration of the audit procedure.

4) Duration of fly exposure

- Exposure time has been set at 20 minutes, as this has been shown to be close to the optimum time of contact for meaningful bioassays; it also allows auditing personnel just enough time to carry out the audits during tight turn-around periods for visiting aircraft.

- After 20 minutes exposure, the sliding lids are carefully replaced under the test cages, which can then be removed from the aircraft surface. The cages and their lids are once again secured with a rubber band. The order of removal is exactly the same as the order in which the cages were placed, so that all flies have had 20 minutes exposure.

5) Observation period after exposure

- Observation period for the fate and health status of the test flies does not need to be longer than 2 hours, as within that time span, all flies should have gone through their "worst-case" conditions. It is recommended to take three readings of the health status of the test flies: one

immediately after exposure (20 minutes), at 1 hour after exposure, and at 2 hours after exposure. (See Residual Disinsection Audit sheet).

- A guide to the terminology associated with assessments of the health status of test flies is presented in Table 1 below:

Table 1: Health Status of Test Flies

HEALTHY	**(H)**	Healthy: Normal movement and flying behaviour
AFFECTED	**(S)**	Sick: Signs of distress, dragging legs, flying erratically; excessive grooming.
	(KD)	Knocked Down: Lying on back, legs and wings moving; not capable of sustained flight.
	(D)	Dead: No more movement observed

6) Decision-making process (Pass or Fail?)

- After 2 hours of observation of the flies, the results are ready to be interpreted

- The first step is to "pass or fail" each cage:
  * A "*ceiling cage*" receives a pass when 30% or more of the flies are affected (i.e. Sick, Knocked Down, or Dead) at some stage within the two-hour observation period.
  * All *other cages* receive a pass when 70% or more of their inhabitants are affected (S, KD, or D) at some stage within the observation period.
  Indicate a "Pass" or "Fail" for each cage in the last column of the *Residual Disinsection Audit* sheet.

- The next step considers the two floor cages:
  * When all three failed: Aircraft failed the audit
  * When one or two failed: Follow-up bioassays to be carried out or aircraft failed audit…. Continue with the results of other cages.
  * When all three passed: Continue with the results of the other cages.

- Finally, the remaining eight cages are taken into consideration:
  * When five or more of these fail: Aircraft fails audit.
  * When three or four fail: Follow-up bioassay to be carried out.
  * When three or four of these cages fail as well as one or two of the floor cages: Aircraft fails audit.
  * When only one or two cages fail, the aircraft passes the audit, but non-compliance signals may be sent to the airline (i.e. breakdowns in regular touch-up sprays of frequently-cleaned surfaces).

NB: In order for the audit results to be valid, the "Control" cage *must* receive a "Pass"

An easy, step-by-step, decision-making key is printed on the attached *Residual Disinsection Audit* sheet.

7) Follow-up notes

- Follow-up bioassays can, in some instances, be carried out on the same aircraft, but will in practice be more likely to involve other aircraft of the same airline.

- When bioassays show that regular touch-up sprays are not, or too infrequently, performed, the airline may be notified of a non-compliance regarding these weekly procedures.

Residual Disinsection Audit

Airline AC Type	AC Registration	Audit Location	Audit ref. no.
Audit date	Audit time	Auditor(s)	
Treatment date	Expiry date	Treatment performed by	Country

Cage#	Location in AC	Cage positioning	No. flies	Exposure Time 20 mins	Health observations / survival of flies			Pass or Fail
					20 mins	1 Hour	2 Hours	
1	On **floor** front of window seat:							
2	On **floor** front of window seat:							
3	On **floor** under seat number:							
4	On **wall** nr. seat number:							
5	**Ceiling** Aisle Row:							
6	**Ceiling** Aisle Row:							
7	**Inside locker** Row:							
8	On **bulkhead** Row:							
9	**Outside locker lid** Row:							
10	**Toilet wall** (inside)							
control	Inside plastic bag							must pass

H = Healthy: Normal movement and flying behaviour.

Affected Categories:

S = Sick: Signs of distress, dragging legs, flying erratically or not at all; excessive cleaning

KD = Knocked Down: Lying on back, legs and wings moving; not capable of sustained flight

D = Dead: No more movement observed

Decision-making key:

Determine which cages Pass or Fail:

Ceiling Cages: (#5 and #6) **PASS** when 30% or more of the flies are affected *at some stage* within observation period.

All other cages PASS when 70% or more are affected *at some stage* within observation period.

1. All three floor cages (#1, #2, ***and*** #3) Fail…..……..…. **Aircraft Failed**
   One ***or*** two of the floor cages Failed ……..……..……..…… **2**

All three floor cages (#1, #2, *and* #3) Passed ……..…….……..... **3**

2. Three or more of the non-floor cages (## 4-10) Failed ……..…...…….……...…. **Aircraft Failed**
   Two or fewer of the non-floor cages (## 4-10) Failed ……...… **Follow-up bioassays required**

3. Five or more of the non-floor cages (## 4-10) Failed ……..**Aircraft Failed**
   Three or Four of the non-floor cages (## 4-10) Failed ……..…. **Follow-up bioassays required**
   One or Two of the non-floor cages (## 4-10) Failed ……. **Aircraft Passed**

Monitoring of weekly Touch-up Sprays:

When either or both cages #9 and #10 Fail: **Check on Compliance re: weekly touch-up sprays**

Final Result:

AC Failed	Follow-up bioassays	Weekly Touch-ups	AC Passed

APPENDIX 2: Spray Quantities of Commercial Aircraft

Spraying must be completed using either an MQS/AQIS approved aerosol.

The propellant must be an Australian National Registration Authority and/or New Zealand Ministry for the Environment approved for use as a propellant in the disinsection of aircraft cabins.

(Approved propellants are HFC134a or mixtures of 134a and HCFC 141b).

All spray cans must conform to the Australian Standard AS2278.

Spray types required:

1) **Pre-spray:** permethrin 2%
   (*The amount of spray listed under Pre-spray is what is required for Pre-spray, Pre-embarkation or On Arrival spray).*
2) **Top of Descent:** d. - phenothrin 2%
3) **Hold Spray:** d. - phenothrin 2% with permethrin 2%

(For any aircraft type not listed, contact either MQS/AQIS for advice on that aircraft's disinsection requirements).

Airbus A300

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	200g	200g		150g	150g
Freighter	50g	200g	Pre-spray is for flight deck and toilet only	150g	150g

Airbus A310

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	100g	100g		150g	150g
Freighter	50g	200g	Pre-spray for flight deck and toilets only	150g	150g

Airbus A318 / A319 / A320 / A321

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	100g	100g		150g	150g
Freighter	50g	100g	Pre-spray for flight deck and toilet only	150g	150g

Airbus A330 (All models)

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	300g	200g		150g	150g
Freighter	50g	300g	Pre-spray for flight deck and toilets only	150g	150g

Airbus 340 (All models except A340-600)

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	300g	200g		150g	150g
Freighter	50g	300g	Pre-spray for flight deck and toilets only	150g	150g

Airbus A340-600 only

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	300g	200g		300g	300g
Freighter	50g	300g	Pre-spray for flight deck and toilets only	300g	300g

Antonov **AN124 & AN22**

MODEL	Pre-Spray	TOD Spray	COMMENTS
Freighter	100g	700g	Freighter aircraft only There are no holds Pre-spray for flight deck and toilets only Top of Descent is: 100 grams upper deck 600 grams main deck

British Aerospace **BAe 146 (100 /200 /300)**

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	100g	100g		150g	150g
Freighter	50g	100g	Pre-spray for flight deck and toilet only	150g	150g

Boeing B707 All Models

MODEL	Pre-spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	100g	100g		150g	150g
Freighter	50g	100g	Pre-spray is for flight deck and toilet only	150g	150g

Boeing B717 All models

MODEL	Pre-spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	100g	100g		150g	150g
Freighter	50g	100g	Pre-spray is for flight deck and toilet only	150g	150g

Boeing B727 All models

MODEL	Pre-spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	100g	100g		150g	150g
Freighter	50g	100g	Pre-spray is for toilet and flight deck only	150g	150g

Boeing B737 All models

MODEL	Pre-spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	100g	100g		150g	150g
Freighter	50g	100g	Pre-spray is for toilet and flight deck only	150g	150g

Boeing B747

MODEL	Pre-spray	TOD spray	COMMENTS	Front Hold	Rear Hold
Passenger 100/200/300/ 400	400g	400g	Not Combi or SP	300g	300g

Boeing B747 COMBI

MODEL	Cabin Pre-spray	Cabin TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger Main Cabin area	300g	300g	Main deck has a cargo area at rear of aircraft	300g	300g
Cargo area main deck			150g (Hold spray)		

Boeing B747 SP

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	300g	300g		150g	150g

Boeing B747 Freighter All models

Pre-embarkation spray

MODEL	Pre Embarkation	COMMENTS	Front Hold	Rear Hold
Freighter	400 grams	50 grams for flight deck and upstairs cabin 350 grams for main deck	300g	300g

Boeing B747 Freighter All models

Pre-spray & Top of Descent spray

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Freighter	100g	400g	Pre-spray is for flight deck and toilets only	300g	300g

Boeing B757 All models

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	100g	100g		150g	150g
Freighter	50g	100g	Pre-spray is for flight deck and toilets only	150g	150g

Boeing B767 All models

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	200g	200g		150g	150g
Freighter	50g	200g	Pre-spray is for flight deck and toilet only	150g	150g

Boeing B777 All models

MODEL	Pre-Spray	TOD Spray	COMMENT	Front Hold	Rear Hold
Passenger	300g	300g		300g	300g

Boeing KC135 Stratotanker

MODEL	Pre-Spray	TOD Spray	COMMENT	Front Hold	Rear Hold
Freighter only		100g	No holds (this area contains fuel tanks)		

Fokker F28 / F100

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	100g	100g		150g	150g
Freighter	50g	100g	Pre-spray for flight deck and toilets only	150g	150g

Ilyushin IL76

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Freighter only		200g	There are no holds		

Lockheed C5 Galaxy

MODEL	Pre-Spray	TOD Spray	COMMENTS
Freighter only		700g	Freighter aircraft only There are no holds Top of Descent is: 100 grams upper deck 600 grams main deck

Lockheed C17 Globemaster

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Freighter only		200g	There are no holds		

Lockheed C130 Hercules

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Freighter only		100g	There are no holds		

Lockheed C141 Starlifter

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Freighter only		200g	There are no holds		

Lockheed L-1011 Tristar All models

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	200g	200g		150g	150g
Freighter	50g	200g	Pre-spray is for flight deck and toilets only	150g	150g

Lockheed P3 Orion

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Freighter only		100g	There are no holds		

McDonnell Douglas DC 8 (Series 10 to 50)

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	100g	100g	Applies to SRS 10's to 50's	150g	150g
Freighter	50g	100g	Pre-spray for flight deck and toilets only	150g	150g

McDonnell Douglas DC 8 (Stretched Series 60 & 70)

MODEL	Pre-Spray	TOD Spray	COMMENTS	Hold
Passenger	100g	100g	Applies to SRS 60's and 70's	Each Hold
			Most of these aircraft have four belly holds	150g
Freighter	50g	100g	Pre-spray for flight deck and toilets only	150g

McDonnell Douglas DC9 / MD80 to MD90

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	100g	100g		150g	150g
Freighter	50g	100g	Pre-spray is for flight deck and toilets only	150g	150g

McDonnell Douglas DC 10 (Series 10 & 30)

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	200g	200g	Some DC10s have a wall between the rear and bulk hold. In these cases the bulkhold requires a separate 150g spray.	150g	150g
Freighter	50g	200g	Pre-spray is for flight deck and toilets only	150g	150g

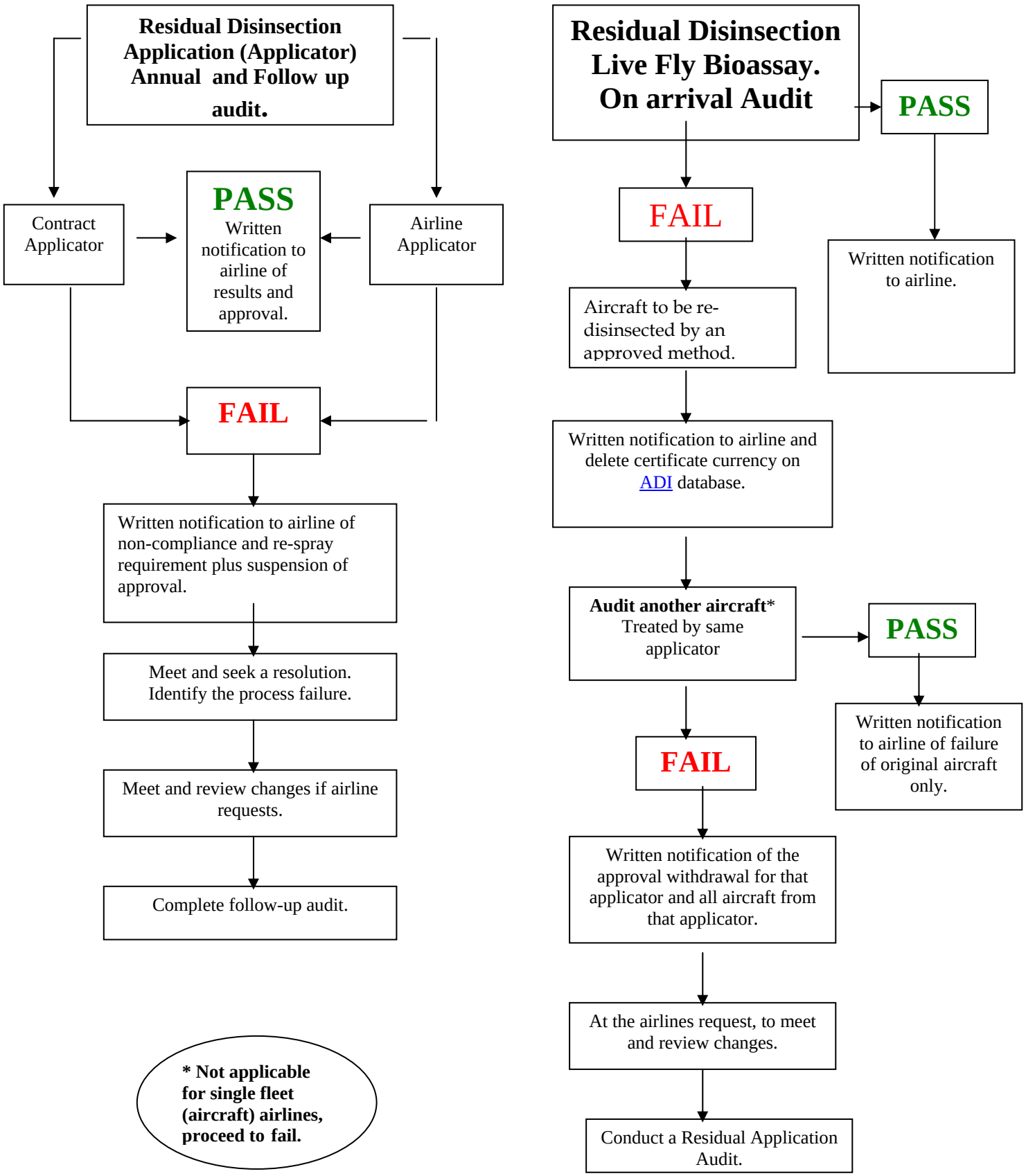
McDonnell Douglas KC10 Extender

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Freighter only		200g		150g	150g

McDonnell Douglas MD 11 All models

MODEL	Pre-Spray	TOD Spray	COMMENTS	Front Hold	Rear Hold
Passenger	200g	200g		150g	150g
Freighter	200g	200g		150g	150g

APPENDIX 3: Non-compliance Flowcharts



Pre-embarkation, Top of Descent and Hold Disinsection.

Annual Audit.

FAIL

Notification to airline of non-compliance and withdrawal of approval. (Written notification to follow).

Explanation to airline of non-compliance.

MQS/AQIS suggested remedial action to be undertaken by airline.

Written reply of remedial action completed.

Follow Up Audit

FAIL

Approval for disinsection type withdrawn in writing.

PASS

Written notification to airline of results and reinstated approval.

PASS

Written notification to airline of results.

Pre-embarkation, Top of Descent and Hold Disinsection.
On arrival non-compliance.

Disinsection certification missing or incorrect.

Re-spray of aircraft.

Written notification to airline.

Meet and seek a resolution.

Multiple non-compliance may lead to the withdrawal of the airline's disinsection approval.

APPENDIX 4A: Pre-embarkation Disinsection Certificate

Aircraft registration No: _____ Flight No: _____

Airport of departure: _____ Date of departure: _____

Aircraft type: _____ Series: _____

This is to certify that the above aircraft has this day been disinsected by the Pre-embarkation method in accordance with the New Zealand MAF Quarantine Service (MQS) and Australian Quarantine and Inspection Service (AQIS) requirements and that the following actions were carried out:

❑ Aircraft is free of passengers.

❑ Aircraft fully catered and service doors closed.

❑ Flight deck, overhead lockers, coat lockers, toilets, crew rest areas and main cabin have been sprayed with 2% permethrin.

❑ Aircraft is off blocks within 60 minutes of completion of disinsection.

_____ Number of aerosol cans used. *(write number)*

_____ Volume of cans used. *(write grams)*

I certify that I have witnessed the completion of the above disinsection process.

Signature: _____

Name: _____
(Please print)

Title: _____

Name of organisation _____

Australian Government
Australian Quarantine and Inspection Service

APPENDIX 4B: Pre-embarkation Certificate (Cabin and Hold)

(For use where the Cabin and Hold applicator is the same)

Aircraft registration No: _____ Flight No: _____

Airport of departure: _____ Date of departure: _____

Aircraft type: _____ Series: _____

This is to certify that the above aircraft has this day been disinsected by the Pre-embarkation method in accordance with the New Zealand MAF Quarantine Service (MQS) and Australian Quarantine and Inspection Service (AQIS) requirements and that the following actions were carried out:

CABIN

❑ Aircraft is free of passengers.

❑ Aircraft fully catered and service doors closed.

❑ Flight deck, overhead lockers, coat lockers, toilets, crew rest areas and main cabin have been sprayed with 2% permethrin.

❑ Aircraft is off blocks within 60 minutes of completion of disinsection.

_____ Number of aerosol cans used. *(write number)*

_____ Volume of cans used. *(write grams)*

HOLD

❑ Cargo loading completed.

❑ Holds disinsected with 2% permethrin and 2% d. - phenothrin.

❑ Doors closed (spray application through the portholes).

❑ Doors partially closed.

_____ Number of aerosol cans used. *(write number)*

_____ Volume of cans used. *(write grams)*

I certify that I have witnessed the completion of the above disinsection.

Signature: _____

Name: _____
(Please print)

Title: _____

Name of organisation _____

Australian Government
Australian Quarantine and Inspection Service

APPENDIX 4C: Top of Descent Disinsection Certificate

Aircraft registration No: _____ Flight No: _____

Airport of departure: _____ Date of departure: _____

Aircraft type: _____ Series: _____

This is to certify that the above aircraft has this day been disinsected by the Top of Descent method in accordance with the New Zealand MAF Quarantine Service (MQS) and Australian Quarantine and Inspection Service (AQIS) requirements and that the following actions were carried out:

PRE-FLIGHT

❑ Flight deck, overhead lockers, coat lockers, toilets and crew rest areas have been sprayed with 2% permethrin, prior to the occupancy of passengers and up to 1 hour before departure.

_____ Number of aerosol cans used. *(write number)*

_____ Volume of cans used. *(write grams)*

TOP OF DESCENT

❑ The aircraft cabin has been sprayed with 2% d. - phenothrin at Top of Descent.

_____ Number of aerosol cans used. *(write number)*

_____ Volume of cans used. *(write grams)*

I certify that I have witnessed the completion of the above disinsection.

Signature: _____

Name: _____
(Please print)

Title: _____

Name of organisation _____

Australian Government
Australian Quarantine and Inspection Service

APPENDIX 4D: Top of Descent Certificate (Cabin and Hold)

(For use where the Cabin and Hold applicator is the same)

Aircraft registration No: _____ Flight No: _____

Airport of departure: _____ Date of departure: _____

Aircraft type: _____ Series: _____

This is to certify that the above aircraft has this day been disinsected in the **Cabin** by the Top of Descent method and also by an approved method for the **Hold** in accordance with the New Zealand MAF Quarantine Service (MQS) and Australian Quarantine and Inspection Service (AQIS) requirements and that the following actions were carried out:

CABIN

PRE-FLIGHT

❑ Flight deck, overhead lockers, coat lockers, toilets and crew rest areas have been sprayed with 2% permethrin, prior to the occupancy of passengers within 60 minutes before departure.

_____ Number of aerosol cans used. *(write number)*

_____ Volume of cans used. *(write grams)*

TOP OF DESCENT

❑ The aircraft cabin has been sprayed with 2% d. - phenothrin at Top of Descent.

_____ Number of aerosol cans used. *(write number)*

_____ Volume of cans used. *(write grams)*

HOLD

❑ Cargo loading completed.

❑ Holds disinsected with 2% permethrin and 2% d. - phenothrin.

❑ Doors closed (spray application through the portholes).

❑ Doors partially closed.

_____ Number of aerosol cans used. *(write number)*

_____ Volume of cans used. *(write grams)*

I certify that I have witnessed the completion of the above disinsection.

Signature: _____

Name: _____
(Please print)

Title: _____

Name of organisation _____

APPENDIX 4E: Residual Disinsection Certificate

All passenger and crew compartments: ☐

All cargo compartments: ☐

of this aircraft _____ were treated with permethrin on
(Aircraft Registration)

_____in accordance with the World Health Organisation (WHO)
(Date of treatment)

'Report of the Informal Consultation on Aircraft Disinsection'.

The treatment must be renewed if cleaning or other operations remove a significant amount of the permethrin residue, and in any case within 8 weeks of the above date.

Expiry Date: _____
(8 calendar weeks from the date of treatment)

Signed: _____

Official Stamp

Designation: _____

Date of issue of certificate: _____

Australian Government
Australian Quarantine and Inspection Service

APPENDIX 4F: Hold Disinsection Certificate

Aircraft Registration No: _____ Flight No: _____

Airport of departure: _____ Date of departure: _____

Airline: _____

This is to certify that the cargo holds of the above aircraft have this day been disinsected by a method in accordance with the New Zealand MAF Quarantine Service (MQS) and the Australian Quarantine and Inspection Service (AQIS).

- ❑ Cargo loading completed.
- ❑ Holds disinsected with 2% permethrin and 2% d. - phenothrin.
- ❑ Doors closed (spray application through the portholes).
- ❑ Doors partially closed.

_____ Number of aerosol cans used. *(write number)*

_____ Volume of cans used. *(write grams)*

I certify that I have witnessed the completion of the above disinsection process.

Signature: _____

Name: _____
(Please print)

Title: _____

Name of organisation _____

APPENDIX 4G: Pre-embarkation Disinsection Certificate for Light Aircraft (Cabin and Hold)

Aircraft registration No: _____ Flight No: _____

Airport of departure: _____ Date of departure: _____

Aircraft type: _____ Series: _____

This is to certify that the above aircraft has this day been disinsected by the Pre-embarkation method in accordance with the New Zealand MAF Quarantine Service (MQS) and Australian Quarantine and Inspection Service (AQIS) requirements and that the following actions were carried out:

CABIN

❑ Aircraft is free of passengers.

❑ Aircraft fully catered and service doors closed.

❑ Flight deck, overhead lockers, coat lockers, toilets, crew rest areas and main cabin have been sprayed with 2% permethrin.

❑ Aircraft is off blocks within 60 minutes of completion of disinsection.

_____ Number of aerosol cans used. *(write number)*

_____ Volume of cans used. *(write grams)*

HOLD

❑ Cargo loading completed.

❑ Holds disinsected with 2% permethrin.

❑ Doors closed (spray application through the portholes).

❑ Doors partially closed.

_____ Number of aerosol cans used. *(write number)*

_____ Volume of cans used. *(write grams)*

I certify that I have witnessed the completion of the above disinsection.

Signature: _____

Name: _____
(Please print)

Title: _____

Name of organisation _____

APPENDIX 5: List of approved organisations for Residual Disinsection

Applicator	Location
• Air Calin, Traffic and Ground Services	Noumea, New Caledonia
• Advance Fumigation	London, United Kingdom
• Air Pacific Ltd.	Fiji
• Amalgamated Pest Control	Brisbane, Australia
• Amalgamated Pest Control	Cairns, Australia
• Amalgamated Pest Control	Canberra, Australia
• Boracure Auckland 1969 Ltd.	Auckland, New Zealand
• Eagle Pest Control	Sydney, Australia
• Exopest Control	Melbourne, Australia
• Fifeshire Pest and Hygiene Services	Christchurch, New Zealand
• Freeland Environmental Services	Perth, Australia
• John Holland Aviation Services	Melbourne, Australia
• Ministry of Public Health, National Management of Health Borders & Transport, Buenos Aires	Buenos Aires, Argentina
• Na Ka Oi Fumigation	Palau (Saipan)
• Pape and Company	Santiago, Chile
• Pest Busters Vietnam / United Elite Ltd	H.M.C (Ho Chi Minh City), Vietnam
• Qantas Airways	Australia
• Quality Pest Services	Darwin, Australia
• Quarantine Treatment Centre (QTC) Ltd	Auckland, New Zealand
• SIA Engineering Company	Singapore
• Tahiti Pest Control	Tahiti

APPENDIX 5 cont

• Termimesh Pest Management	Perth, Australia
• United Elite Pest Service	Hong Kong
• United Elite Pest Service	Taipei

APPENDIX 6: List of approved organisations for Pre-embarkation Disinsection

Applicator	Location
• Air Paradise – Crew	
• Air Tahiti Nui – Crew	
• Asiana Airport Services	Seoul, Korea
• Business Jets Ltd – Pilots	
• Cathay Pacific (Hong Kong Airport Services – H.A.S)	Hong Kong
• Challenger Air – Pilots	
• China Airlines – Crew	
• Consolidated Press Holdings – Crew	
• Crown Ltd – Crew	
• Emirates – Crew	
• Execujet – Crew	
• Garuda Maintenance	Denpasar, Indonesia
• Garuda Groundstaff	Auckland, New Zealand
• International Airline Services (I.A.S)	Brisbane, Australia
• JAL Ground Service (Narita)	Tokyo, Japan
• JAL Ground Service Kansai	Osaka, Japan
• Ground Handling Fukuoka	Fukuoka, Japan
• Jet City - Crew	
• Korean Airline Services (K.A.S)	Seoul, Korea
• Malaysia Airline Systems (MAS)	Kuala Lumpar, Malaysia
• Marc Plan Charter – Pilots	
• Network Jet JV – Pilots	

- New Zealand MAF Quarantine Service (MAFQS)
- Pacific Blue Airlines – Crew
- Pacific Jets Ltd – Pilots
- Rank Services Ltd – Pilots
- Royal Australian Air Force (RAAF 34 Squadron) – Crew
- Royal New Zealand Air Force (RNZAF) – Crew
- S.I.A Cargo Division — Sydney, Australia
- S.I.A Engineering — Singapore
- S K Foods – Pilots
- Thai Airways – Crew
- Walker Air – Pilots

APPENDIX 7: List of approved organisations for Top of Descent Disinsection

Applicator	Location
• Eva Air – Evergreen Airline Services (EGAS) - Pre–spray EVA Crew - Top of Descent	Taipei
• Royal Brunei - Crew	
• Royal New Zealand Air Force (RNZAF) - Crew	

APPENDIX 8: List of approved organisations for aerosol Hold Disinsection

Airlines that currently hold a Top of Descent or Pre-embarkation compliance agreement with either AQIS or MAFQS have an approved hold spray process.

Applicator	Location
• Menzies Aviation New Zealand Ltd	Auckland, New Zealand
• New Zealand MAF Quarantine Service (MAFQS)	
• Hong Kong Airport Services (H.A.S)	Hong Kong
• Evergreen Airline Services (EGAS)	Taipei
• Garuda Maintenance	Denpasar, Indonesia
• Korean Airline Services (K.A.S)	Seoul, South Korea
• Malaysia Airline Systems (M.A.S)	Kuala Lumpar, Malaysia
• Pacific Jets Ltd – Pilots	
• PlaneBiz Ltd	Christchurch, New Zealand
• Royal Brunei Ground Staff	Brunei
• Royal New Zealand Air Force (RNZAF) – Crew	
• Thai Airways Load Control Department	Bangkok, Thailand