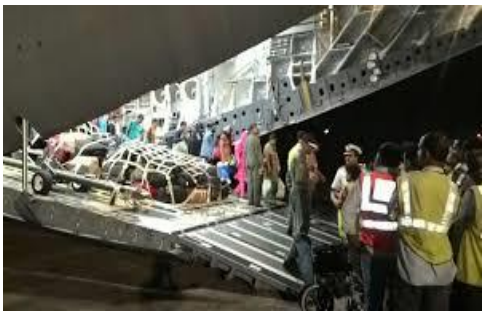
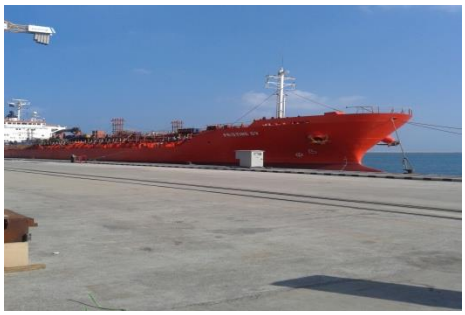
# POINT OF ENTRY

# FIELD MANUAL

**FOR**

**TECHNICAL STAFF WORKING**
**IN**
**AIPORT HEALTH ORGANISATIONS**
**PORT HEALTH ORGANISATIONS,**
**BORDER QUARANTINE ORGANISATIONS**



**PUBLIC HEALTH- INTERNATIONAL HEALTH DIVISION**
**DIRECTORATE GENERAL OF HEALTH SERVICES**
**MINISTRY OF HEALTH & FAMILY WELFARE**
**GOVERNMENT OF INDIA**

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## Preface

Photo of Dr. Sujeet Singh

The entry of the International Health Regulations (IHR), 2005 on 15 June 2007 is a public health landmark in the field of International Health. The successful implementation of the IHR (2005) by the countries that have agreed to be bound by them will contribute significantly in enhancing national and global public health security thus helping to minimize public health risks caused by the spread of diseases through international traffic.

India as one of the State parties to the IHR (2005) has an obligation to strengthen public health capacities at designated airports, ports and ground crossings in both routine circumstances and when responding to events that may constitute a public health emergency of international concern. The primary areas that need to be focused on include identifying the competent authorities to carry out: (i) development of core capacities at designated points of entry; (ii) implementation at points of entry of appropriate levels of hygiene and sanitation as well as ensuring effective vector, rodent and environment control measures and procedures; and (iii) application of health measures at points of entry in affected areas.

The current manual titled 'POINT OF ENTRY FIELD MANUAL' for Technical Staff working at Airport Health Organisations, Port Health Organisations and Border Quarantine Organisations is the first of its kind in the country with the aim of strengthening the core capacities of the technical staff placed at the Points of Entry.

I hope, this manual through its simple language and illustrations serves the purpose as Hands on Guide for the different technical staff working at the Points of Entry.

Dr. Sujeet Singh,
DDG (MH & IH)

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## Foreword

Photo of Dr. Jagdish Prasad

India being a committed signatory to the International Health Regulations (2005),its core capacity to deal with Public Health Emergencies of International Concern begets prime importance. With considerable increase in international trade and traffic, with the burgeoning ports in the country with its vast coastline, the increasing number of airports in the mushrooming cities, and the ever increasing human movement transcending local, interstate and international borders, the health system at the points of entry faces a mammoth task in terms of maintaining routine surveillance and to address Public Health Emergencies of International Concern as and when the challenges are encountered. Ensuring vigilant, efficient, effective 'Points of Entry' Health Security forces depends to a great extent on the competency of the prevailing health system and depends to a much greater extent on the multidimensional multi stakeholders who play very crucial role in routine surveillance and during emergencies.

This manual is an attempt to strengthen the Core capacity of the technical staff to ensure food and water safety, safety from rodents and the various vectors at Points of Entry.

I am immensely pleased to present the Manual to the technical 'Points of Entry' community for using the manual as a guide and also provide critical feedback which would facilitate in improvising on the future editions.

Dr. Jagdish Prasad,
DGHS

**Abbreviations**

AHO – Assistant Health Officer

APHO – Airport Health Organisation

CHO – Chief Health Officer

DGHS - Directorate General of Health Services

FW – Field Worker

HA - Health Assistant

HI – Health Inspector

IHR – International Health Regulations

LDC – Lower Division Clerk

NCDC – National Centre for Disease Control

NVBDCP – National VectorBorne Disease Control Programme

PHEIC – Pubic Health Emergency of International Concern

PHO – Port Health Organisation

PoE – Point of Entry

UDC – Upper Division Clerk

VVIP – Very Very Important Person

WHO – World Health Organisation


**CONTENTS**

# Chapter No 1 – Introduction

Airport Health Organizations, Port Health Organizations and Border Quarantine Organizations (Ground Crossings) are the Health Units working under Annex 1B of IHR-2005 at Point of Entries (PoE). The PoE health units are established by Government of India under the Directorate General of Health Services (DGHS), Public Health- International Health division to implement the Article 22 and various other Articles related to the Ships and Port areas, Aircraft and Airport Areas and Ground Crossings and relevant surrounding areas.

The Health Units at PoE to have the trained technical manpower headed by Health Officer who functions as the Regulatory Authority, Assistant Health Officers, Health Inspectors, Health Assistants and Field Workers to prevent any vector borne diseases entering or exiting at PoEs and also carry out the obligation under IHR-2005 at all PoEs.

As part of the health team at the Points of Entry, Field Workers play an important role for the implementation of the Vector Control measures, disinsection, deratting, disinfection or decontamination on ships and port areas under the guidance of the Health Inspector/Health Assistant. The entire team at the Point of Entry will be under the direct supervision, direction, guidance and orders of the Assistant Health Officers who will report to the Chief Health Officer.

This Manual deals with the surveillance and control measures for Vectors on Conveyances (Ships, Aircrafts & Ground Crossing Vehicle) and PoE areas. The Vector Control measures are aimed at the Vectors of Public Health Importance - Mosquitoes, Rodents, Cockroaches, Houseflies and Fleas.

The Point of Entry administrating authority has to maintain at the PoE and surrounding areas good sanitation and undertake vector control measures with their sanitary inspector and staff or by outsourcing through qualified pest control agencies following the guidelines issued by the PoE Health Authority. The PoE Field staff are to supervise, coordinate, undertake surveillance and follow up the control activities as required in the IHR-2005 and Port Health Rules for the PoE and surrounding areas.

# Chapter No 2 – Functions at the Points of Entry

Point of Entry (PoE) and Exit of all countries are the Airports, Seaports and Ground Crossings with border countries. Ensuring regular ongoing sanitation and vector control activities at Point of Entries is very important for achieving the goal of prevention of import of newer or infectious diseases into our Country or export of infectious diseases to other parts of the world from our Country as reiterated in the International Health Regulations (2005).

**Major Functions of Airport Health Organization (APHO)**

The major functions of Airport Health Organisation are -

- Airport Quarantine work: The health screening of international passengers referred by immigration staff at International airports.
- Disinfection, disinsection and deratting of aircrafts.
- Supervision of sanitation, drinking water supply, anti-mosquito and anti-rodent work inside airports.
- Dead body clearance.
- Administration of yellow fever vaccine and issue of yellow fever vaccination certificate at identified yellow-fever vaccination centres.
- Arrangements for the quarantine of yellow-fever suspects in the yellow-fever hospitals at Mumbai, Kolkata, Chennai, Tiruchirapalli and Delhi airports.
- To attend aircraft medical emergencies.
- VVIP food inspection.
- Inspection of food stuff, catering establishments inside the premises of airport under the Prevention of Food Adulteration Act.
- Sampling of imported food items and forwarding the lab analysis report, as and when requested by custom authorities.
- Licensing of eating establishments within the local limits of airports as per the provisions of PFA Act, 195

**Major Functions of the Port Health Organization (PHO)**

The major functions of Port Health Organisation are -

- Authority for inspecting ship/vessels, including health screening, medical examination of travelers, monitoring baggage, cargo, containers, goods, postal parcels and human remains from departing and arriving ships/vessels, so that they are maintained in such a condition that they are free of sources of infection or contamination, including vectors and reservoirs;
- Supervision and coordination of measures so that facilities used by travellers at points of entry are maintained in a sanitary condition and are kept free of sources of infection or contamination, including vectors and reservoirs;

- Responsible for the supervision of any deratting, disinfection, disinsection or decontamination of baggage, cargo, containers, conveyances, goods, postal parcels and human remains or sanitary measures for persons, as appropriate under these Rules;
- Advise conveyance operators, as far in advance as possible, of their intent to apply control measures to a conveyance, and shall provide, where available, written information concerning the methods to be employed;
- Be responsible for the supervision of the removal and safe disposal of any contaminated water or food, human or animal waste, wastewater and any other contaminated matter from a conveyance;
- Take all practicable measures consistent with the Indian Port Health Rules 2015 to monitor and control the discharge by ships of sewage, refuse, ballast water and other potentially disease-causing matter which might contaminate the waters of a port, river, canal, strait, lake or other international waterway;
- Be responsible for supervision of service providers for services concerning travellers, baggage, cargo, containers, conveyances, goods, postal parcels and human remains at points of entry, including the conduct of inspections and medical examinations as necessary;
- Have effective contingency arrangements to deal with an unexpected PHEIC and/or any other infectious disease and disseminate information and the measures to deal with it to all the concerned agencies at the port;
- Shall be in communication with the National IHR Focal Point on the relevant surveillance activities, potential public health risk, and public health measures by the fastest means of communication.
- Shall be responsible for coordinating additional health measures at the port as decided by the Central Government in the event of PHEIC.

**Major Functions at Ground Crossings are**

- Health screening and medical examination of the travelers and inspection of baggage, cargo, containers, lorry, train or other vehicle, goods, postal parcels, human remains and relevant documents, whenever necessary.
- Surveillance of International Passengers and Crew for yellow fever disease
- Quarantine of Passengers
- Public health clearance of dead body/human remains
- Public Health clearance if Death of Passenger takes place during journey.
- Medical Emergencies
- Activities during Public Health Emergencies of International Concern (PHEIC)
- Food Hygiene & Safety Duties
- Supervision of Sanitation, drinking water supply, anti-mosquito and anti-rodent work
- Training Activities

- VVIP food inspection.

## Chapter No 3 – Roles and Responsibilities of Technical Field Staff

**Roles: -** Field Worker (FW) is now uniformly designated at the PoE by integrating various other names they were designated before like rat catcher, fumigation worker etc. Field Worker will carry out the field work as assigned by the Health Officer.

**Command Chain: -** All field workers will be working under the supervision and orders of the Health Assistant. Both the Health Assistant (HA) and Field Workers will work under the supervision and orders of the Health Inspectors (HI). The Field Workers, Health Assistants, Health Inspectors will work under the Command, instructions of the Assistant Health Officer (AHO). The whole team will then report to the Chief Health Officer (CHO) who will be **Commanding Officer** of the entire team at the PoE. The Technical Staff will work in teams or together depending on the staff strength and the requirements at PoE under the instructions of the Chief Health Officer.

**Technical Work: -** The Field Worker, Health Assistant, Health Inspector, Assistant Health Officer will work at PoE on the following activities-

a. **Vector Control Measures**- Anti-Mosquito measures, Anti-Rodent Control measures, Housefly Control measures, Cockroach Control Measures and all other vector control measures. This includes the preventive measures, surveillance, control activities, fumigation, health education, follow up measures, vector surveillance charts, specimen collection, sample preparation, labeling, packing, dispatch to laboratory, safe disposal of the vectors, samples, insecticides, pesticides, supervision, training and follow up with the PoE sanitary staff or outsourced sanitary staff. FW will follow all the instructions and guidelines as and when given by the HA/HI/AHO/CHO. HA/HI will also do all the activities under the directions of AHO. AHO/CHO will be the overall implementing, training and supervising authority.

b. **Conveyance Inspections** - The field worker will assist the commanding officers (CHO/AHO/HI/HA) on the conveyance inspections as and when required under the orders of the AHO/CHO.

c. **FBOs/Water Safety** - The Field Worker will assist the Food Outlet inspections carried out by the CHO/AHO/HI under the orders of the CHO/AHO/HI.

d. **General** – Cleanliness of the Office premises, sanitation, gardening, Emergency duties as needed under CHO instructions, PHEIC related duties, assistance during any disasters, assistance to state health departments during PHEIC.

**Administrative Work -** All types of administrative work of the office as per the orders of the CHO/AHO/UDC/LDC are to be carried out by the FW, HA, HI. Any work with respect to the Organization assigned by the CHO is to be undertaken by the FW/HA/HI/AHO.

**Activities of the Vector Control Team -** The Vector Control Team comprises of multiple stakeholders at the different levels under the leadership of the Chief Health Officer at the Points of Entry. Vector Control Plan has to be developed by the Health Team under the leadership of the Chief Health Officer, in consultation with the stakeholders at the Points of Entry and has to be renewed regularly. All the Corporation, Municipal, Panchayat, the Port Community Stakeholders, District Vector Control team and their Head of the Department

details are to be kept ready for effective coordination of the Vector control measures in and around the Perimeter of the PoE areas. The updated Government Vector Control Plans must be kept with the PoE and the local state coordinating NVBDCP, NCDC and the Entomologists.

# Chapter No 4. Mosquito Control

**Public Health Importance of Mosquitoes** - Mosquitoes are estimated to transmit disease to more than 700 million people annually. Mosquitoes carry many infectious diseases from several different classes of microorganisms, including viruses and parasites. Mosquito-borne illnesses include Malaria, West Nile Virus, Elephantiasis, Dengue Fever, Yellow Fever etc. The control of mosquitoes is extremely important at the Points of Entry.

For the Field Technical Staff at the PoE, the Mosquito Control is one of the most important activities to be undertaken.
The whole PoE area has to be divided to 5 days and Saturday is to be kept for review of the troublesome areas, any follow up needed on surveillance on vectors or illness among the persons. Surveillance being one of the key aspects of the Vector Control Plan, the Surveillance team will be headed by HI/HA. All Field workers must record the key points noted during the surveillance and then prepare a report with the assistance of the HA and HI. The final compilation will be done by the HI for submission to the Health Officer. Personal Protective Equipment has to be worn by all the field workers during the surveillance and control measures. This includes Gloves, Goggles, Masks, Gum Boots, Helmet, Reflector Jackets, Full sleeve dress.

## Mosquito Control Measures

They include the following -

- **Source reduction** - Environmental methods of controlling mosquito breeding including source reduction minor engineering works, by filling ditches, pits, low lying areas, streamlining, canalizing, desilting, deweeding, trimming of drains, water disposal and sanitation, emptying water containers once in a week and observing weekly Dry Day.

- **Use of larvicides** - Recurrent anti-larval measures at **weekly intervals** with approved chemical larvicides to control the vector mosquitoes are recommended. The following chemical larvicides are used in the programme: T**emephos, Bti (WP & 12 AS).**
- **Use of larvivorous fish** - larvivorous fish like Gambusia and Guppy are also used in certain situations where the chemical control is not feasible. In some urban areas. Biological larvicide, Bacillus thuringiensis israelensis either wettable powder or aqueous suspension are also used for control of aquatic stages of vector mosquitoes.
- **Space spray** - Presently Temephos (2.5ml/10 litres of water), Bti (50-100ml/10 litres depending on depth of water body) is used as per the NVBDCP program.

During insecticide spraying, the Insecticide is to be mixed with proper dilutions of water. Measuring cups must also be carried in the kit. The spraying of the insecticide is always to be done with the wind directions and never against it. The nozzle adjustment has to be done for long distance spray in large water bodies to stream for forceful and long curvy reach and spray type for the smaller and easily reachable water bodies. All staff after the Anti-Mosquito work must wash their hands, body and face well to ensure that no spillage or sprayed droplets are on the skin as they are absorbed through the skin also. In the event of any field worker have any symptoms of the Organophosphorous poisoning to report to the Health Officer immediately. The Anti-Larval Insecticide sprayers and the larvicide are to be taken for simultaneous spray activities at the field. The Larvicide is to be taken in small dispenser bottle well sealed and marked. All the sprayers are to be properly cleaned and the nozzles are to be kept clear and free of dusts, blockages. The spray machines are to be kept dry and the left over insecticide solution are to be safely discarded in the toilets only which goes to closed drains. The machines are to be kept upside down. The amount of insecticide used on the days to be recorded in the chart and the same to be submitted to the Health Officer regularly. For Space spray, Pyrethrum extract (2%) is used.

# Chapter 5. Rodent Control

**Public Health Importance of Rodents** - Rodents play a key role in transmission of infectious agents in addition to being hazard by their activities. Rodents are carriers of viral, rickettsial and bacterial diseases. The causative agents could enter our body by four different ways:

- through the ectoparasites of rat like fleas, ticks and mites
- by food or water contaminated by rodent excreta
- through direct contact with rodent excreta
- by rat bite

In addition, Rodents cause direct damage to Goods and Structures. Rodent Control at the PoE is one of the most important activities. With the growing traffic and the ships calling frequently from Plague Endemic Countries to all Indian Ports, very effective rodent control at the Points of Entries is a huge challenge.

**Rodent Inspection for a ship or a building in the port**

1. Begin in the basement or substructure. The idea is to find as many areas as possible that might provide harborage, food, water, or access.
2. Detailed notes have to be made regarding the schematic map of the ship or the building.
3. Try to locate all entry points and nesting areas. *"Starter holes"* for rodents to enlarge and these can be openings as small as 1/4 inch in diameter in walls, around pipe entries, sewer outlets, under doors, cable duct outlets,vent holes, life boat stores, life rafts, rescue boats, mooring ropes & stores on ships, etc. Unscreened Sewer outlets and even toilets can give rats access to buildings. Nests are often composed of Shredded paper, pieces of plastic, and bits of fabric gathered together into a 5-inch diameter mass for Mice and 8 to 12 inch diameter for rats. In addition, many a times there would be evidence of food debris, bones etc.
4. Look for water leaks and rooms where water condenses on the walls.
5. Always be on the lookout for piles of trash, clutter or other debris.
6. Note where the crew takes their breaks or eat lunch. These areas can present Sanitation problem.
7. Rodents like to follow edges; inspect these areas for excreta, rub marks, urine, or other indications of activity.
8. Inspect locker rooms, cafeteria, kitchen, and crews' lounge, canteens, pantries in office buildings, store rooms.
9. Garbage Station is one of the important area to look out for activity. Take note of how garbage is dealt with, what condition dumpsters and garbage cans are in, and whether rodents have easy access to garbage.
10. Inspect the Mooring Ropes placed on deck by removing them fully and seeing in between the space created by their placements and the floor for excreta, food debris.

11. Life boat stores store food items and all open life boats are ideal places for rodent harborage. Inspect the store rooms of all the Port buildings, ask the staff on the rodent activity.
12. It is essential to inspect godowns storing food grains.
13. On the outside of the ship or the building, it is essential to check doorways for gaps or holes and note windows without screens or glass.
14. Look for other openings in the structure—holes, vents without screens, holes around plumbing, and electrical wire entry points.
15. Note any power lines running into the upper portions of ship; these give rodents access to the roof.
16. Check for irrigation leaks and any standing water such as irrigation or drainage ditches, stagnant pools.
17. On the roof, check air conditioning units that might provide water and harborage for rats.

**Rodent Control Measures**

**Rodent Survey Purposes:** Field workers to assist the Health Officer in the following activities
a) Find out the rodent species, estimated rodent population, rodent harbourages, food attraction for the rodent and activity range of the rodent.
b) Assist in planning of rodent disinfestation operation and long-term rodent prevention measures.

**Rat Flea Index -** The number of rat flea collected from the rat examined per each rat examined gives Rat-flea Index.

$$\text{Rat Flea Index} = \frac{\text{No of rat flea collected from the rat examined}}{\text{Total no of rat examined}}$$

It has been reported from World Health Organization (WHO) that a Rat-flea Index of greater than 1 represents an increased potential plague risk for human.

**Rodent Infestation Survey –** It is the total number of rat traps which have rats against the total number of rats placed.
**Participation of all the stakeholders concerned is the key to success in sustaining effective rodent control.**

**Rodent Control Measures**

**Fundamental control -** Improve the sanitary condition of the environment and deprive rodents of: Food, Harborage and Passages.

**The other measures include –**

**A) Using Rodent Traps**

Rodent traps fall into three general categories; snap traps, live traps, and glue boards. Each kind of trap is better suited to some situations than others.

1. **Snap Traps.**


Figure No 1

These traps are widely available and can be made more effective by expanding the trigger (Figure No 1) so that they can be tripped by a mouse or rat simply by running over the trap. Do not place them where human toes might accidentally get caught, unless the traps are protected inside a bait station. These traps work well in dusty places, but snap traps should not be used in areas with standing water or high humidity because the mechanism will rust and the trap will be useless.

**2. Live Capture Traps**

Figure No 2

Live traps are available for rats and mice, but the rodents must be killed once they are trapped. When mouse populations are high, multiple-catch live traps may be more efficient than snap traps.

**3. Glue Boards**

Figure No 3

These are boards covered with a sticky material that will catch mice and rats. Glue boards provide the advantage of catching and retaining rodent hairs, droppings, and ectoparasites coming from the trapped animal. Glue board traps should be inspected daily in order to prevent unnecessary suffering by the trapped animals. If glue boards are used in areas where they might fall and get stuck to something, secure the traps with a nail or wire.

**Baiting the Traps**

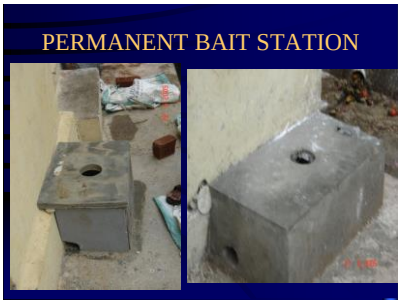


Figure No 4

Baits for Norway rats include pieces of liver, peanut butter, hot dog, bacon or nut meats. Suggested baits for roof rats include nuts, dried fruits or fresh fruits such as bananas or apples. Bajiyas (potato, onion), with fresh coriander leaves for attractive smell or dried fish fried with little oil can be used as baits. Rotation of baits as per local available food can be taken by the team on experience. Cereal (like oatmeal) can be sprinkled around the traps to

make them more attractive. Based on several attempts, the bait that works best for the situation can be found out.

**B) Using Rodenticides - Types of Rodenticides**

- These rodenticides are anticoagulants which work by preventing blood from clotting. The older anticoagulant rodenticides such as warfarin, chlorophacinone, and pindone are recommended over the newly developed anticoagulants. The older anticoagulants last for only a few days in a dead rodent body, therefore they pose less of a hazard to non-target organisms than other rodenticides such as brodifacoum, which can last for many months. Zinc phosphide, an acute poison, can be useful for burrow baiting in its wax pellet formulation. Rodents eat small doses of these chemicals over several days and eventually die from internal bleeding.
- The newer rodenticides: Brodiafacoum,Bromodiolone and Difethialone baits (Ready to use cake or concentrate) can be used because of their potential to be lethal in a single feeding, can be more effective than the other anticoagulant in certain situations.

**Disposal of dead rodents**

The following procedures can be used for handling dead rodents found:

- using tools such as tongs to put the dead rodents into a tough plastic bag
- spraying the carcasses with general household disinfectant or diluted bleaching solution until they are soaked thoroughly;
- sealing the bag tightly and placed it into another plastic bag. The second plastic bag should also be sealed;
- putting the bagged material properly in covered rubbish bin or disposing of it to the nearest refuse collection point.

When handling dead rodents, attention should be paid to personal and environmental hygiene. Wear gloves and face mask, if necessary, when handling dead rodents and avoid direct contact with them. All areas, clothes and items contaminated by the dead rodents should be disinfected thoroughly using general household disinfectant or diluted bleaching solution. Before taking off gloves, wash them with water and then cleanse with general household disinfectant or diluted bleaching solution. Hands should be washed thoroughly with soap and water after removing the gloves.

# Chapter No 6 - Houseflies & Cockroach Control

**Public Health Importance of Houseflies**

- The common housefly, Musca domestica, lives in close association with people all over the world. The insects feed on human foodstuffs and wastes where they can pick up and transport various disease agents. It is largely as a result of their indiscriminate feeding habits that houseflies spread disease. They may settle and feed on decaying organic matter which contains many bacteria. If later the flies alight on food for human consumption, harmful bacteria are deposited on it. Some of the diseases transmitted by houseflies include typhoid, diarrhea, eye inflammation, cholera or polio.

**Housefly Control Measures**

- Focus on Environmental Sanitation
- Four strategies can be employed:

— reduction or elimination of fly breeding sites including safe disposal of the garbage;
— reduction of sources that attract flies from other areas;
— prevention of contact between flies and disease-causing germs
— protection of food, eating utensils and people from contact with flies.

- Chemical Control measures are to be carried out based on the severity & nuisance of the infestation. The type of chemicals and method of application are to be done as per Health Officer instructions & as per need at the PoE. Generally the life span of the Houseflies is 30 - 40 days and after a specific period they are completely eliminated with change in temperature and humidity.

**Public Health Importance of Cockroaches**

They are proven or suspected carriers of the organisms causing: diarrhea, dysentery, cholera, leprosy, plague, typhoid fever — viral diseases such as poliomyelitis. In addition they carry the eggs of parasitic worms and may cause allergic reactions, including dermatitis, itching, swelling of the eyelids and more serious respiratory conditions.

**Cockroach Control Measures**

1. **Environmental management - Cleanliness and hygiene** - Food should be stored in tightly covered containers in screened cabinets or refrigerators. All areas have to be kept clean so that no fragments of food or organic matter remain. Rubbish bins should

be securely covered and emptied frequently, preferably daily. Basements and areas underneath buildings should be kept dry and free of accessible food and water.

**Reduction of accessibility -** Groceries, laundry, dirty clothing, egg crates and furniture should be checked before being taken into a building. In some instances, accessibility to buildings can be reduced by closing gaps in floors and door frames. Openings for drain water and sewer pipes, drinking-water and electricity cables should also be closed

2. **Chemical control** - Cockroaches are difficult to control with insecticides for several reasons, one of which is that they may become resistant to commonly used compounds. Moreover, many insecticides are repellent to them and are therefore avoided. Chemical control gives only temporary relief and, wherever possible, it should be accompanied by environmental sanitation and improvement in the housing conditions.
3. To mix **Boric Acid: Gram Flour (Besan) Powder** at **1:2 ratio**, with sweetened condensed milk, and make it into a paste. These pastes to be kept at the different places inside the galley, pantry, mess rooms on a paper.The same paste to be used to paste on the ceilings, all cupboards, inside cabinets, walls,behind refrigerators, below wash basins, in drainage pipes, in and around provision rooms and in cabins if needed. During the initial phase of the cockroach control the paste has to be reapplied weekly once for a month. Then depending on the control the timing of reapplication can be extended to 2 weeks & then 3 weeks.

   This paste will then act as bait as they are attracted to them as food. The condensed milk, besan powder are attractants and by taking Boric acid, cockroaches die of dehydration.

   Alternative for Gram Flour: Boiled Potato & Boiled Egg with Boric Acid & Sweetened Milk.The above method has to be combined with regular weekly cleaning program. Cockroaches need food & water to survive. During thorough weekly cleaning program, all the hidden areas, corners, inside & behind cabinets, storage cupboards, behind & below refrigerator have to be cleaned with soap solution or bleaching solution.

**<u>Common Environmental Vector Control Measures</u>** - Environmental sanitation is the most important, long term, sustaining aspect for the control of Rodents, Cockroaches, Houseflies and other pests.

- The agricultural products are to be categorized into bulk and packed items, whether it is in container or in bulk vessel, period of expected storage time in the PoE. The Food Catering units are all to be monitored for proper storage and disposal of garbage in their premises. The Garbage disposal is to be increased in frequency depending on the volume.
- The inspection of the warehouses for proper drainage of water during rains, adequate number of Tarpaulin sheets to cover bulk cargo, nets for exclusion of the houseflies on all packed cargo or if many doors of the warehouses are to be kept open for operational reasons.
- All the surrounding areas of the warehouses where agricultural products are to be stored are to be kept free of garbage dumps. This screening is to be done by the field staff under the supervision of the Health Officer. At Laundry rooms and toilets, the floors have to be kept free from any water collection, they should be regularly painted and regularly deodorized .

**Maintaining Good Sanitation inside conveyances include -**

- To seal holes in walls, panels, dead space-entry exit points.
- Wash basins, drainage lines, panels to be free of any leakages.
- To paint all rusted walls, floorings, cabinets, store, cupboards regularly (2-3 months once).
- Broken panels, cupboards – wooden especially should be repaired.
- To provide covered Garbage bins.
- To ensure that scuppers of all drainage lines are removable for cleaning purpose. The drainage holes to be cleaned scraped & painted regularly.
- The drainage line should be even. If any broken tiles it should be replaced or cemented. The drainage lines should be scraped of food wastes & painted regularly.
- To provide separate colour coded Garbage collection bins for plastics,food wastes & other wastes (tins, cans, bottles, paper crockery etc.) in Galley & Pantry.
- To provide warm water for cleaning and to ensure the free flow of all the drains.
- To throw the food garbage after each meals to the deck storage drums and to keep them always covered.
- To have separate Garbage collection bins for food wastes, plastics & other wastes. At the end of each day, to remove the scuppers and clean on both sides. This is one of the active breeding point & food source for cockroaches away from direct sight.

# Chapter No 7 - Miscellaneous

**A). Water Safety and Food Safety**

The inspection for safe water supply in the PoE is one of the important surveillance activities by the field teams. The water is to be monitored at Storage and distribution points. The Water Safety Plan for the PoE to be checked during the routine surveillance. A monthly Chlorination report to be submitted by the PoE Water Supply department and a 6 monthly Full Analysis and Microbiological report is to be submitted.

The Chloroscope is used to check the chlorination and the Ortho Toludine solution is added to the water to check the levels of the residual Chlorine in the water. The levels of Chlorination at Storage point can be upto 1 to 1.5 mg/L (1 to 1.5 ppm) and at consumer points to be minimum of 0.2 to 0.5 mg/L or 0.2-0.5 ppm.

The inspection of the Food Business Operating units in PoE will be monitored by the DO, FSO at the PoE as per the FSSA-2006 and FSSR-2011. The Field Workers will assist under the directions of the Health Officer as and when needed.

**B) Public Health Emergencies of International Concern**

The field worker and the other staff are to be part of the team during PHEIC as part of the Standard Operating Procedure under the directions of the Health Officer.

# Chapter No 8 - Procedure for Disinfection of Aircrafts

**Disinsection of Aircrafts:** WHO RECOMMENDED METHODS OF DISINSECTION FOR AIRCRAFTS As per the IPCS 1995 WHO recommends the following methods of disinsection, and will be accepted for flight disinsection: 1. Residual disinsection 2. Pre-Embarkation cabin disinsection 3. Blocks – away method 4. Top on Descent.

**1. Residual disinsection:-** The residual disinsection method involves the regular spraying of certain internal surfaces of the aircraft cabin (excluding food preparation areas) and hold with a residual insecticide; this ensures that, if an insect gains access to the aircraft and lands on a surface, it will receive an effective dose of insecticide. Treatment must be repeated at intervals not exceeding eight weeks. Any treated areas subsequently deep cleaned or refurbished within the treatment interval must be retreated to ensure compliance (WHO, 1995).

**2. Pre-embarkation cabin disinsection: -** The pre-embarkation cabin disinsection system was developed in Australia and New Zealand and provides for the spraying of aircraft cabins in the absence of passengers, i.e. before embarkation. The treatment lasts for the duration of the single flight sector. 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 may board between the time of disinsection and departure. The number of insects that enter a treated cabin between these times may be fewer than enter an untreated cabin because of the repellent effect of Permethrin (WHO, 1995; R. Kleinpaste, personal communication). Spraying is carried out using 2% Permethrin aerosols. All overhead lockers are opened, and the cockpit, toilets, wardrobes and other insect harbourage areas such as the galley are also treated at this time. This treatment is carried out in conjunction with a suitable hold treatment option (residual or aerosol).

**3. Blocks away disinsection: -** "Blocks away" disinsection takes place before take-off but after passengers have boarded and the doors have been closed. The aircraft is treated by cabin crew members walking through the cabins discharging aerosols at the prescribed dosage (spray cans). Crew must treat all possible insect harbourages, including toilets, galleys, wardrobes and lockers. Holds and the flight deck are sprayed before departure – the flight deck before boarding by the crew.

**4. Pre-flight and top-of-descent spraying: -** Pre-flight and top-of-descent spraying is a two-part process. The pre-flight spray is carried out before the passengers board and is usually performed in conjunction with a pre-flight disinsection of the hold. The timing of this spray allows lockers to be open and causes minimum inconvenience to passengers. A subsequent in-flight spraying is carried out at "top-of-descent", i.e. as the aircraft starts its descent to the destination airport.

The details of procedure, disinsectant, chemicals and its validity will be as per the specifications recommended by WHO. Proof of disinsection will have to be submitted to the Airport Health Officer on arrival, failing which the Airport Health Officer reserves the right to disinsect the aircraft

**Annexure**

## Organophosphorus Poisoning

- Organophosphate poisoning most commonly results from exposure to insecticides or nerve agents. They are one of the most common causes of poisoning worldwide.

- **Common Symptoms include -**
  Salivation, Lacrimation, Urination, Defecation, Gastrointestinal motility, Emesis, muscle weakness, fatigue, muscle cramps, anxiety, headache, convulsions, depression of respiration and circulation, tremor, general weakness, and potentially coma.

- **Management**

  - OP compounds or organophosphates are absorbed into the body via the digestive tract, skin and mucus membranes; they are also absorbed through the respiratory tract if inhaled.

  - Health Care Providers must equip themselves with Personal Protective Equipment and at all times follow Standard Precautions while handling the Organophosphorous compounds

  - Skin which has come in contact with this material should be washed immediately with soap and water.

  - All contaminated clothing should be removed and discarded.

  - The affected person should be immediately shifted to a health care facility for further treatment and management.

**References**


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