

SUMMARY OF AIRCRAFT DISINSECTION PUBLICATIONS BY THE INTERNATIONAL CIVIL AVIATION ORGANIZATION & THE WORLD HEALTH ORGANIZATION

*PREPARED FOR THE ITF BY J. MURAWSKI, AFA-CWA, ITF AFFILIATE
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1983, WHO published “Control of insect vectors in international air and sea travel” (WPR/RC34/13)

This paper recommends aircraft disinsection (especially blocks-away) to prevent the spread of vector-borne diseases to islands in the South Pacific, but also highlights the need to implement integrated pest management strategies in and around international airports.

1985, WHO published “Recommendations on the disinsecting of aircraft” (WHO Weekly Epidemiological Record, 60: 45-52, 1985)

In this paper, the WHO states that insecticidal action of aircraft disinsectants shall not be inferior to a standard formulation of DDT and pyrethrum extract, and that alternative aerosols of 2% permethrin, d-phenothrin, resmethrin, or bioresmethrin may be used, all with chlorofluorocarbons as propellants. This paper also describes some history of WHO involvement in aircraft disinsection, starting with WHO recognition of the potential to transport vector-borne disease via aircraft in 1949. The first WHO recommendations for aircraft disinsection were published in 1961 (Annex 6 of the 11th Report of the Expert Committee on Insecticides) and later in the first edition of the International Health Regulations (IHR) in 1969. The pyrethroids used on aircraft today were first recommended in 1973 by the WHO Expert Committee on Insecticides (Technical Report Series, No. 513).

1986, WHO published article on environmental management for vector control (WHO Weekly Epidemiologic Record, 61: 345-352, 1986)

This paper references a two-day technical discussion by an expert WHO panel intended to “promote an alternative approach [to vector control]...as an answer to the well-known problems faced by Member States in the application of conventional chemical methods of control. These constraints include insecticide resistance, a decreasing acceptance of house-spraying, environmental concerns, and the rising cost of insecticides, the import of which puts a burden on the balance of payments of many third-world countries.” This paper was not addressing aircraft disinsection specifically, but many of the same concerns apply to aviation.

1989, Paper titled “Inflight disinsection as an efficacious procedure for preventing international transport of insects of public health importance” is

published in the Bulletin of the WHO (Russell, RC and Paton, R, Bulletin of the WHO, 67(5): 543-547, 1989)

This paper summarizes the results of Australian research that assessed the efficacy of “blocks away” and “top of descent” disinsection by measuring mortality of mosquitoes and house flies kept in cages throughout the cabin at “virtually all types of locations where insects could rest in the cabin.” The paper reports 100% mortality and notes that, as a result of this research, “top of descent” disinsection was introduced as the recommended procedure for aircraft arriving in Australia. It is not clear if mosquitoes or flies could hide in the cabin more effectively if they were flying freely and not caged, and what impact this may have on insect mortality. Either way, these results enabled Australia to require “top of descent” spraying which reduced ground time delays associated with spraying upon or prior to arrival.

1989, Paper titled “Airport malaria: a review” is published in the Bulletin of the WHO (Isaacson, M, Bulletin of the WHO, 67(6): 737-743, 1989)

This paper summarizes 29 cases of airport malaria reported in Europe, notes the risk of delayed diagnosis and treatment, and emphasizes the need for tests to exclude malaria, not only for people who have recently traveled, but for patients who work at or live near an international airport. The aircraft cabin, cargo hold, and wheel bays were noted as potential sources of insects that carry disease.

1990, WHO publishes review paper titled “Aircraft disinsection” (Quelennec, G., Control of Tropical Diseases, PCS/EC/90.19) at the 1990 meeting of the Expert Committee on the Safe Use of Pesticides

This paper describes the history of aircraft disinsection recommendations and consultations by the WHO, defines the current recommendations, and outlines the advantages and drawbacks of each. It notes that Australia and New Zealand recommend “top of descent” spraying because the crew is busy when the aircraft is on the ground and “if any discomfort should occur among passengers, the aircraft is about to reach a place where care could be provided.”

1991, WHO publishes “Safe Use of Pesticides” (WHO Technical Report Series 813, 14th Report of the WHO Expert Committee on Vector Biology and Control)

In the section on aircraft disinsection, this report notes the “possibility that vector resistance to pyrethroids may develop”, suggesting “further work on alternative insecticides for residual treatment.” Mechanical disinsection is not referenced, but insects can not develop resistance to mechanical means.

1995, Eleventh Meeting of ICAO's Facilitation Division (FAL/11)

The United States presented a working paper on disinsection that resulted in a recommendation by the Facilitation Division for a standard or recommended practice that the Council subsequently issued.

1995, WHO publishes the "Report of the Informal Consultation on Aircraft Disinsection" held in at WHO/HQ, Geneva, 6-10 Nov 1995 (WHO/PCS/95.51)

This report summarizes the discussions of this informal Consultation convened at WHO in 1995 and supported by the US Department of Transportation. The Consultation was asked to evaluate the need for aircraft disinsection, how it should be implemented (if necessary), and what chemicals and methods can be recommended. The report notes the potential for vector-borne diseases to be spread by aircraft, describes aircraft disinsection methods, and summarizes information on the toxicity of the sprays. The Consultation agreed that spraying the occupied cabin should be limited to flights that could pose a threat to public health, agriculture, or environment (Section 8; see also FALP/3-WP4), and recommended that the 1985 disinsection recommendations be revised and republished, noting that "continuing development and testing by industry and WHO of alternative insecticides and formulations for aircraft disinsection are needed because of emerging pyrethroid resistance among important vector species" (Recommendation 16). The report concludes that "aircraft disinsection, when needed, would continue to prevent spread of insects and, if performed appropriately, it would not present a risk to human health or to the environment" (Section 10). It does not comment on the prevalence of States' "blanket spraying requirements" without regard for risk of transmission at departure/arrival point or season. Also, it does not comment on the absence of exposure control measures to standardize and limit exposure of crew and passengers to disinsectants.

17-21 Nov. 1997, First Meeting of ICAO's Facilitation Panel (FALP/1), Montreal

FALP/1-WP/13: This working paper presented by the Secretary cites the history of passenger and crew reports of severe allergic reactions attributed to aerosol spraying of aircraft. It describes the two points of view raised at the FAL/11 (1995) meeting, "on the one hand, that of the States concerned about the possible effect of disinsection on passengers and crews and, on the other hand, that of the States which continue requiring disinsection to protect public health, the environment, animals, and plants." It acknowledges the 1984 WHO recognition that "conventional methods of disinsection had in some cases apparently caused allergic or other unfavorable reactions in passengers, or at least might have acted as triggers for allergic reactions by some well-known allergens and/or haptens." It notes that, to address those concerns, the residual method of disinsection was developed in New Zealand. It notes that the Facilitation Division issued a "B-type recommendation", asking the WHO to lead

a review of the International Health Regulations and aircraft disinsection recommendations, noting that ICAO would participate in order to make appropriate changes to the disinsection Standards and Recommended Practices (SARPs) in Annex 9. The paper also references the 1995 WHO-led “informal consultation” on disinsection that concluded that “aircraft disinsection, when needed, would continue to prevent the spread of insects and, if performed appropriately, would not present a risk to human health or the environment.” However, the paper does propose some disinsection guidelines, including that States should ensure adequate surveillance for insect pests in and around international airports, should collect and evaluate evidence related to insect transmission, should produce national and regional disinsection strategies, and should provide appropriate information to crew and passengers upon request.

2000, WHO published a paper titled “Why aircraft disinsection?” (Gratz, NG et al., Bulletin of the WHO, 78(8): 995-1004, 1989)

This paper describes cases of the “inadvertent transport of live mosquitoes aboard aircraft arriving from tropic countries where vector-borne diseases are endemic” and concludes that “there is an important ongoing need for the disinsection of aircraft coming from airports in tropical disease endemic areas into non-endemic areas.”

12-16 Feb 2001, Third Meeting of ICAO’s Facilitation Panel (FALP/3), Montreal

FALP/3-IP/1: This information paper presented by the Secretary reports the results of ICAO’s aircraft disinsection practices survey. Of the 67 States that responded to the survey, 37 require disinsection, and the Secretariat obtained information from other sources that an additional 23 States that did not respond to the survey do require disinsection.

FALP/3-WP/4: This working paper presented by the Secretary includes proposed revisions to the aircraft disinsection ICAO Standards and Recommended Practices. The major proposed revisions were: (1) an upgrade from recommended practice to standard that Contracting States limit spraying the occupied cabin to flights where there is a real threat to public health, agriculture, or the environment (rename and renumber Recommended Practice 2.24 to Standard 2.23); (2) a new Standard calling for Contracting States to periodically review and revise their disinsection rules, as appropriate (new Standard 2.24); and (3) an upgrade from recommended practice to standard that Contracting States provide information on disinsection to passengers or crew upon request (rename and renumber Recommended Practice 2.26 to Standard 2.28).

FALP/3-WP/12: This working paper, presented by the Secretary, describes and justifies the revisions to the aircraft disinsection standards in Annex 9, as proposed in FALP/3-WP/4. The Secretary notes that “in light of the volume of

concerns expressed on the effect on human health of the insecticides used for aircraft disinsection, it would appear that there is sufficient support worldwide for [requiring that States limit spraying an occupied cabin].” Similarly, the Secretary notes that “it would appear that worldwide public sentiment would support [a requirement that States provide disinsection information in clear language upon request].”

22 Mar – 2 Apr 2004, Twelfth Session of ICAO’s Facilitation Division (FAL/12), Cairo

FAL/12-IP/6: This information paper presented by the Secretariat provides the Facilitation Division with a disinsection update since their last meeting in 1995, including changes to the Annex 9 disinsection standards and the results of the ICAO disinsection survey.

FAL/12-IP/34: This information paper presented by the United States (US) describes research conducted by US government researchers to develop and test an efficacious and mechanical means to contain flying insects. The paper concludes that “air curtains can be used to effectively exclude mosquitoes and flies, 99% and 100% respectively, from passing through a doorway that has human traffic similar to passengers boarding an aircraft.”

FAL/12-WP/29: This working paper presented by the Secretariat describes the results of an ICAO survey on invasive alien species. Aircraft disinsection was one of the means that States reported to limit the spread of invasive alien species, in addition to light traps, quarantine declarations, education, and physical interventions.

FAL/12-WP/61: This working paper presented by the US describes a mechanical alternative to currently approved chemical methods of disinsection, noting research that demonstrates it to be as least as efficacious as pesticide-based methods without possibility of misapplication or adverse health effects. It invites the Facilitation Division to consider a new standard for inclusion in Annex 9 that would require States to allow non-pesticidal approaches to aircraft disinsection, assuming they are shown to be as least as effective as those chemical methods approved by the WHO.

FAL/12-WP/69: This working paper presented by the International Transport Workers’ Federation (ITF) raises concerns regarding the lack of exposure control measures, the uneven industry standards for application and ventilation, the absence of clear justification for spraying regulations, the need for passengers and crews to be informed of insecticide application, and the need for a non-chemical alternative means to control insect transmission via aircraft.

FAL/12-WP/103: This draft report was republished in final form as WP/117.

FAL/12-WP/117: This report of Committee 1 to the Plenary confirms that the Facilitation Division agreed to revise Standard 2.24 to refer to WHO-recommended methods of disinsection, “whether chemical or non-chemical,” to address (in part) the US proposal in WP/61 that Contracting States allow, subject to their national regulations and approval by the WHO, alternative methods of disinsection once shown to be at least as effective as currently-approved chemical methods. In response to the ITF concerns raised in WP/69, the Division adopted the following three “B-type” recommendations: that States are strongly encouraged to implement the Annex 9 disinsection standards; that ICAO take a leadership role, working with Contracting States, WHO, and other stakeholders - including the ITF - to clarify the intent of current disinsection standards and to develop guidance material to minimize exposure; and that ICAO urgently work to evaluate mechanical means of disinsection.

28 Sept – 8 Oct 2004, 35th Session of the ICAO Assembly, Montreal

The ICAO Assembly adopted Resolution A35-13, requesting that the ICAO Council “encourage the exploration of non-chemical approaches to aircraft disinsection of the cabin and flight deck,” assist the WHO in evaluating such non-chemical approaches, and report back to the Assembly at the next ordinary session.

16-25 May 2005, Fifty-Eighth World Health Assembly, Geneva

In 2005, the 58th Assembly of the World Health Organization adopted a revised edition of the International Health Regulations. The definition of disinsection was updated to “the procedure whereby health measures are taken to control or (emphasis added) kill the insect vectors of human disease present in baggage, cargo, containers, conveyances, goods and postal parcels” (Part I, Article 1). Also, the reference to disinsection under “health measures and procedures” was changed from: “disinsecting...shall be carried out so as not to cause undue discomfort to any person, or injury to his health...” to “disinsecting...shall be carried out so as to avoid injury and, as far as possible, discomfort to persons...” (Part IV, Article 22).

2005, WHO publishes “Safety of Pyrethroids for Public Health Use” (WHO/CDS/WHORES/GCDPP/2205.10, WHO/PCS/RA/2005.1)

The WHO reaffirms its recommendations for permethrin and d-phenothrin for aircraft disinsection (Section 1) and describes the combination of residual and aerosol spraying on aircraft as “an effective treatment method for aircraft leaving areas where vector-borne diseases are endemic” (Section 6.5.2). The WHO acknowledges reports of ill-health attributed to exposure to aircraft disinsectants, but concludes that “the symptoms may be attributable to other etiological factors such as solvents...other pesticides...the microclimatic conditions in the aircraft...and a “psychological” reaction.” It then summarizes the results of a

single study conducted in Germany that measured exposure to pyrethrins and piperonyl butoxide following the “blocks-away” application method on an A310 aircraft (Berger-Preiss, 2004). After estimating the total absorbed dose, concluded that “no systematic health risk is anticipated”, aside from possible upper respiratory tract irritation and paraesthesias. The report does cite an exposure assessment model developed in the US following residual spraying (Sutton, 2003), but does not mention that study’s conclusions of crewmember overexposure and a recommendation for exposure control measures and, preferably, mechanical means of disinsection. The WHO report notes that paraesthesias and, in inhalation exposure, upper respiratory tract irritation are the most commonly reported symptoms, but describes them as “transient discomfort” and notes that “allergic reactions are highly unlikely.”

18-28 Sept 2007, 36th Session of the ICAO Assembly, Montreal

A36-WP/199: This working paper presented by the United States references the risks posed by aircraft disinsection of discomfort and adverse health effects, as reported by aircraft crews and passengers. It also summarizes recent WHO and ICAO activity and invites the Assembly to adopt a resolution similar to (but more detailed than) the Resolution adopted at the 35th Session of the Assembly in 2004.

A36-WP/247: This working paper presented by the International Transport Workers’ Federation summarizes the progress on non-mechanical disinsection and invited the Assembly to consider the ICAO Secretary General recommend that the WHO convene a international scientific symposium in consultation with ICAO. The symposium would bring together interested parties to discuss non-chemical methods of disinsection and the logistics of implementing and enforcing them. The ITF also invited the Assembly to issue a standard to notify passengers of any chemical spraying prior to ticket purchase so that people can decide if the health risks associated with exposure to chemical disinsectants are acceptable.

A36-WP/360: This working paper describes Resolution 18/1, as proposed by the Executive Committee and very similar to Resolution A35-13 that the Assembly had adopted three years earlier. The resolution was based on the non-chemical disinsection papers presented by the US and Canada (A36-WP/199) and the ITF (A36-WP/247), as well Resolution A35-13 (2004), the relevant revisions to the IHR, States’ concerns about the health impact of aircraft disinsection, and the recent research demonstrating an efficacious method of non-chemical disinsection. Specifically, the ICAO Assembly formally asked the ICAO Council to “encourage the exploration of non-chemical approaches to aircraft disinsection of the cabin and flight deck”, urged the WHO to hold a consultation on such methods (including a comparison to chemical methods), and noted the need to report back to the Assembly at the next ordinary session.