

# Dioxin On The Carriers



## The Contamination of Aircraft Carriers And Their Crews in the Gulf of Tonkin

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## Individual Exposure to Dioxin

When the United States began using Chemical Warfare in Vietnam, its stated goals were to defoliate jungle coverage to better see the enemy and to limit the enemy's food supply. All levels of Government Agencies claimed to be unaware of the cost in human death and misery that would result, especially within our own ranks. Unintended as that might have been, another unexpected consequence was that our Government would renege on its obligation to care for service-related injuries to its Armed Forces. This refusal to provide health care to some of the war-wounded continues today, nearly 40 years later. Certain American Vietnam veterans continue to suffer and die from dioxin-related diseases with no assistance from the Department of Veterans Affairs (DVA). Yet health care and disability compensation is given to other Vietnam veterans with exactly the same medical conditions. A division in the ranks was created.

According to the Department of Veterans Affairs (DVA), there was no way for dioxin-based herbicide to travel from the land to aircraft carriers offshore. They have directed that all claims for contamination by herbicide exposure from personnel stationed on offshore vessels be denied service-connected benefits. The only exception is when an individual can prove through documentation having a direct (witnessed and verified) encounter with the herbicide. That exception rarely, if ever, occurs because that type documentation from that time period either no longer exists or is kept well hidden. Additionally, DVA has stated that no naval ships carried Agent Orange, the dioxin-based herbicide of interest.<sup>(1)</sup> This makes claims based on direct exposure from sea-based personal highly unlikely.

Thousands of veterans who served offshore Vietnam as Navy, Coast Guard and Fleet Marine (Blue Water Navy) personnel on all types of ships display the exact symptoms of diseases exhibited by veterans who had their "boots-on-ground," meaning those who stood on solid land within the geographic boundaries of South Vietnam. The DVA acts as if it is mere coincidence that these two groups appear to be somehow related. And they have no logical, scientific or medical evidence to keep them separated.

This distinction is beyond comprehension. The probability of that being pure coincidence is Zero. Nowhere else in the world did other human populations break out with or later develop symptoms of these same diseases during that time, nor have they since. A few individuals related to the war effort in locations where Agent Orange was tested or was being actively used or stored came down with identical maladies. The presence of Agent Orange is the common factor.

## **Beyond Probability**

Dioxin-based herbicide intended to be sprayed on the land mass of South Vietnam travelled out to the Naval ships offshore. The probability that dioxin was present aboard the aircraft carriers is beyond question. It is a certainty.

Those service members who had boots-on ground are receiving their benefits under the rule of presumptive exposure, which only requires their presence anywhere on the land mass of Vietnam at any time between January 9, 1962 and May 7, 1975. They are not required to show any proof of herbicide exposure. Their Blue Water Navy counterparts are presumed to be free of contamination regardless of their location.

The presumption of exposure was originally given to all members of the Armed Forces who fought in the Vietnam War, including those who served offshore, under the provisions of the Agent Orange Act of 1991.(2) The DVA stripped that right from anyone not able to prove boots-on-ground, including those in the bays, ports and harbors.

## **The Facts as We Know Them**

What this current report clearly shows is that those who served on aircraft carriers were exposed to dioxin-based herbicides brought to their ships via the aircraft and should be afforded the same presumption of exposure under the same conditions as given to those with boots-on-ground.

There are several basic facts that are currently known about this time period (1962 to 1975) and events that occurred in South Vietnam:

- We know that the phenomenon of "spray drift" occurred, and was often visible as mist clouds of the spray that stayed airborne for relatively long periods of time;(3)
- We know there are reports that the volatilization or vaporization of 2,4,5T (a component of Agent Orange which contained the highest levels of TCDD /Dioxin), was very high whenever it was open to the air;(4)
- We know that large patches of jungle, including areas that had been sprayed with Agent Orange, were burned with incendiary munitions and that the burning carried particulate matter previously saturated with Agent Orange high into the atmosphere;(5)
- We know that heat amplifies the toxicity of dioxin;(6)
- We know that combat aircraft from offshore carriers flew thousands of sorties though the described atmospheric conditions at relatively low altitudes, in humid conditions, during the course of the war when Agent Orange was actively being sprayed (1962-1972) and in the years to follow (1972-1975). (7)

Based upon the principles of Newtonian physics, we believe such contamination to be a certainty -- beyond question. We are stating that dioxin molecules and aerosols, alone or attached to other particles, stuck to the outer skin of aircraft because of static charge and were carried back to the aircraft carriers, where they were rubbed into the skin and clothing of the aircraft

maintenance deck force and otherwise spread to additional members of the crew by various means, including:

- Clothing that shared communal laundry facilities;
- Fresh water wash-downs of the airplanes which added the dioxin to mists that were inhaled, absorbed through the skin, otherwise ingested by the crew, or settled onto the deck and superstructure;
- Salt water flight deck wash-downs which pushed the residuals of dioxin overboard, only to be sucked up by the intake system for fresh water distillation for that carrier or for any ships following and which made the dioxin airborne once again.

In addition to transport via the static charge attraction to the airplanes, we know that the Agent Orange was mixed at 50%-50% of chemical and fuel oil prior to its being sprayed. Fuel oil is sticky as are other petrochemicals which the airplane encountered during flight including fluids that leaked and exhaust of other aircraft in their flight groups. These oils and "oily substances" were on virtually every returning aircraft.(8)

### **Summary**

The DVA is playing by the rules when it assigns the presumption of herbicide exposure to personnel who served with boots-on-ground in Vietnam. When it comes to personnel who served in the waters offshore, however, they completely change the rules of the game. They remove the concept of presumptive exposure and require a rigid level of "proof of exposure," despite a long history of conclusions that obtaining such proof is virtually impossible.

DVA's disingenuous stance on suspending presumptive exposure flies in the face of medical, scientific and historical data, all pointing to justification for the inclusion of Navy, Coast Guard and Fleet Marines who spent time in the Theater of Combat on all types of vessels off the coast of Vietnam. Carrier-based aircraft had no option but to return to their ships bearing contaminated particles from South Vietnam's toxic atmosphere.

## **BACKGROUND AND SOURCE DETAILS**

### **Surrounded by Particles**

Our atmosphere is made up of many tiny particles, including molecules of various gases that we humans require to live: oxygen, hydrogen, nitrogen, methane and several others. In fact, the density of these particles is extremely high, at about  $10^{18}/\text{cm}^3$  at sea level. That equals a million, million, million particles in every cubic centimeter. Additionally, our atmosphere is also filled with dust and dirt which are far less in size than a quarter the diameter of a human hair.(9)

When we think about our atmosphere, we generally don't consider items of such small size as being things at all. Nonetheless, they are solid things that have mass, that both make up the structure of, and are suspended in, the air that surrounds us. Regardless of their size, in Newtonian Physics they are objects that interact with other objects.

### **Friction and Charge**

Friction is a force created by objects rubbing against one another. These moving objects interact at the molecular level where they exchange positive ions and negative electrons. When this interchange occurs, the result can be electrostatic attraction. Extremely strong interaction can actually weld the two bodies together (referred to as brazing). Less strong interaction keeps the two bodies captured, and they stay attached to one another until the static charge dissipates. When there is electrostatic discharge, attraction is no longer present.(10)

### **Bound by the Laws of Physics**

As something moves through our atmosphere, it comes into contact with all the objects with mass, creating friction, thus creating a static electric charge (or heat, depending on the conditions). The faster something moves through the atmosphere, the stronger the static charge can become.

In the instance of a jet, a very strong static charge can develop and electrical grounding is required for the safety of people leaving or approaching the plane, for the integrity of electronic equipment aboard the aircraft and certainly before any flammable material such as fuel is brought near the plane. The voltage on aircraft can be in the 10's or even 100's of kilovolts. Thus static wicks and grounding cables are designed into and used on these craft for everyone's safety.(11)

Nothing capable of holding a static charge can move through the atmosphere without a static charge developing. Jet airplanes cannot escape static charge build-up. That is a simple fact of physics that we have learned to live with and have taken into account in the design and construction of aircraft.

## **Vietnam's Atmosphere**

Between 1962 and 1972, the United States Military sprayed approximately 23 million gallons of herbicides over the countryside of South Vietnam. Close to 18 million gallons of that was a mixture called Agent Orange. One of the components within the Agent Orange mixture was a form of dioxin (TCDD), which many scientists believe is the most toxic chemical yet created by man.

During the spray operations, which happened on a daily basis unless the weather absolutely ruled out flight, tiny droplets of the herbicide stayed airborne in a phenomenon called "spray drift" and could be carried over 15 miles before settling. Smaller droplets became captured by the wind as aerosol and could easily be carried hundreds of miles. (12)

During and after spray missions, vapors of the herbicide were blamed for heavy damage of vegetation hundreds of yards from their initial location and these vapors and aerosols also became captive by the winds and simply stayed aloft.

The military used incendiary weapons, like napalm, to kill enemy combatants seen or believed to be in some location that had previously been sprayed with herbicide. Burning this vegetation carried large amounts of herbicide-laden particles upward by the smoke plume and heat of these fires. Once the particles were lifted, they could rise to high altitudes and stay suspended in the atmosphere for weeks as well as travel extremely long distances on the winds.

A theory of dioxin dispersion was tested during the 1990s in North America when an Alaskan village detected measurable amounts of dioxin in its local environment. Suspecting that the dioxin was being blown in on winds from the south, an array of sensors was placed around the area and particulate matter that descended to the ground was collected and analyzed. Dioxin was not only measurable, but could be identified as to its source because of its chemical signature. Numerous sites within the Continental United States were identified, and dioxin compounds originating in Mexico were regularly detected. (13)

The myth that dioxin molecules, alone or as part of some other particulate matter, could not travel on the wind is officially put to rest. It simply becomes part of the atmosphere and freely moves on the wind. It was possible for airborne dioxin to reach all the ships serving offshore Vietnam in high enough concentration to kill healthy vegetation. There is absolutely no reason to believe this dosage was not toxic to men.

## **Dosages and Consequences**

Based on what we now know, South Vietnam can easily be identified as having a high atmospheric saturation of dioxin on a nearly continuous basis, more so directly after the nearly daily spraying by Ranch Hand aircraft. And this herbicide spraying program lasted almost 10 years. Dioxin was a persistent element of the local atmosphere of South Vietnam.

The probability of aircraft encountering dioxin in the atmosphere over South Vietnam was 100% for some airplanes at some points in time. That easily invokes the presumption of exposure of the aircraft that returned to sea-based carriers. Immediately upon landing, the maintenance crew was in direct contact with the airplanes which carried the contaminated particles on their outer surfaces. Following their electrical grounding, the static attraction dissipated. The probability of the ground crew contamination can clearly be presumed.

There may be lingering questions about the exactness of which aircraft encountered dioxin and how much was returned to the carrier deck. However, under the rules of presumption of exposure, neither of these notions are considerations as long as the potential for exposure existed. This is what applies to those with boots on ground. If adjudication rules are to be kept uniform and unbiased, it must likewise apply to those on the carriers offshore.

What are the VA's requirements for proof of exposure under the rules of presumptive exposure?

*Exposure opportunity has been defined as the potential for exposure rather than as a quantitative determination of exposure (that is, relatable to dose) and is therefore only a crude estimate of dose (IOM, 2008). There are no environmental concentration data (for example, data on concentrations in soil and water) [...] on which to base estimates of individual dose or exposure levels. Thus, the potential for exposure is the best—in fact, the only—available method for assessing and comparing exposure.(14)*

What are the levels of dioxin considered harmful to the human body? The Environmental Protection Agency (EPA) and other researchers state that there are no known safe levels for TCDD/dioxin. However, in setting standards for safe drinking water, the EPA established the Maximum Contamination Level at 30 parts per quadrillion ( $10^{15}$ ). We are once again taken to the realm of the very small sized particles. (15)

How can dioxin enter the human body?

In 1979, the Air Force was requested to prepare for the DoD a report identifying the most likely criteria by which military personnel could have been exposed to dioxin. Three modes were given:

- *Percutaneous absorption and inhalation of vapors/aerosols by direct exposure to sprays.*
- *Percutaneous absorption and inhalation of vapors by exposure to treated areas following spray application, and*
- *Ingestion of foods contaminated with the material. (16)*

**CONCLUSION**

If the Department of Veterans Affairs is going to be the least bit rational and consistent in their decisions regarding the potential of exposure to herbicide, the same ground rules must apply to all personnel in the area of Vietnam. To the DVA's embarrassment, the IOM Report of May, 2011 concluded that the three types of service (boots-on-ground, inland water service, and Blue Water Navy offshore) had exactly the same level of certainty for herbicide contamination.

In no cases were there grounds for any of these three services to claim to know or demonstrate their level of contamination. All Vietnam veterans were returned to an equal status for the feasibility of contamination.

In this analysis of the probability of contamination to the aircraft carriers offshore Vietnam, a careful scientific analysis of the conditions determined a 100% feasibility of contaminants from the atmosphere being carried back to the carriers once their airplanes entered the airspace above South Vietnam.

Therefore, those who served aboard Task Force 77 aircraft carriers in the Vietnam War at either Yankee or Dixie Stations should receive the same DVA consideration for medical care and disability support as those who were in-country with boots-on-ground.

**Footnotes:**

- 1) Training Letter 10-06, Sept 9, 2010, page 5 <[http://www.bluewaternavy.org/navy\\_nam.pdf](http://www.bluewaternavy.org/navy_nam.pdf)>
- 2) Public Law 102-4 (HR 556), Feb. 6, 1991, <<http://bluewaternavy.org/PL%20102.doc>>
- 3) Spray Drift of Pesticides Arising from Aerial Application in Cotton, Woods, et. al., 2001, <http://www.bluewaternavy.org/harbors/cottonspraydrift.pdf>
- 4) Report of Trip to Republic of Vietnam 15 Aug – 2 Sept, 1969, R.A. Darrow, Dept. of Army, <<http://bluewaternavy.org/harbors/00207.pdf>>
- 5) Operation Pink Rose, GlobalSecurity.org, <<http://www.globalsecurity.org/military/ops/pink-rose.htm>>
- 6) Blue Water Navy Vietnam Veterans and Agent Orange Exposure, IOM, May, 2011, page 137, <[http://www.nap.edu/openbook.php?record\\_id=13026&page=137](http://www.nap.edu/openbook.php?record_id=13026&page=137)>
- 7) Miscellaneous historical reports and interviews with Carrier deck crews and officers, 2012
- 8) Miscellaneous historical reports and interviews with Carrier deck crews and officers, 2012
- 9) Space Handbook, Air University, Maxwell AFB, 1985
- 10) Electricity-Basic Navy Training Courses, NAVPERS 10622, Chapter 2, 1945, <http://www.rfcafe.com/search.htm?cx=partner-pub-0962990858660370%3A186yc9qhmh6&cof=FORID%3A11&ie=ISO-8859-1&q=NAVPERS+10622&sa=Search><http://www.rfcafe.com/search.htm?cx=partner-pub-0962990858660370%3A186yc9qhmh6&cof=FORID%3A11&ie=ISO-8859-1&q=NAVPERS+10622&sa=Search>
- 11) Personal Correspondence, Engineer, Electro-Static Solutions LTD
- 12) Spray Drift From Aerial Application Of Pesticides, Kelly Franklin, 2007, <<http://www.bluewaternavy.org/general/Spray%20drift1.doc>>
- 13) Long-range Air Transport of Dioxin, Commoner, et. al., 2000, <<http://www.bluewaternavy.org/dispersion/dioxins%20canada%203.pdf>>
- 14) Blue Water Navy Vietnam Veterans and Agent Orange Exposure, page 89, IOM Study, 2011
- 15) No Evidence of Dioxin Cancer Threshold, Mackie, et. al., 2003, <http://www.ejnet.org/dioxin/nosafedose.pdf>
- 16) Criteria for Determining Exposure Levels of Military Personnel to Dioxin and Herbicide Orange During Vietnam, 1979, 05762, [http://bluewaternavy.org/harbors/05762criteria\\_air\\_craft%20.pdf](http://bluewaternavy.org/harbors/05762criteria_air_craft%20.pdf)