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**CHEMICAL-BIOLOGICAL WARFARE:
U.S. POLICIES AND INTERNATIONAL EFFECTS**

HEARINGS
BEFORE THE
**SUBCOMMITTEE ON NATIONAL SECURITY
POLICY AND SCIENTIFIC DEVELOPMENTS**
OF THE
COMMITTEE ON FOREIGN AFFAIRS
HOUSE OF REPRESENTATIVES
NINETY-FIRST CONGRESS
FIRST SESSION



NOVEMBER 18, 20; DECEMBER 2, 8, 16, AND 19, 1969

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of the downed men. This protects the rescue crew and aircraft as well as the downed airmen from aimed enemy fire. The rescue team wearing protective masks then extracts the downed crewmen. There are many documented examples of such successful operations.

SUMMARY

The riot control agent, CS, has become a lifesaving part of military operations in Vietnam. CX, the older agent, because of its relative ineffectiveness, is now seldom used. The use of CS in combat operations clearly reduces casualties among friendly troops, permits extraction of civilians who may be under enemy control often without casualties, and frequently allows the enemy the option of capture rather than casualties. Perhaps the most valid indication of the effectiveness of CS in combat operations is that U.S. personnel continue to carry CS grenades to the field in lieu of some of their normal high explosive ammunition, and ground commanders often call for CS rather than high explosives. Riot control agents are a valuable aid in accomplishing our mission and in protecting our forces.

HERBICIDES

Turning now to the use of herbicides in Vietnam, one of the most difficult problems of military operations in South Vietnam is the inability to observe the enemy in the dense forest and jungle. Defoliating herbicides introduced in 1962 are capable of producing a significant improvement in vertical and horizontal visibility in the type of jungle found in South Vietnam. As viewed by an aerial observer, it is often impossible to see through the canopy to detect VC or NVA operations. In 6 to 8 weeks, after spraying with a herbicide, the observer will have good observation through the canopy. For ground observation, defoliation is highly effective in improving horizontal visibility.

The herbicide program in terms of effects produced has required an unusually small investment of military effort. The entire program has been accomplished with an average of about 17 C-123 spray aircraft and several smaller helicopter sprayers plus some improvised ground-spray equipment.

Herbicide operations are conducted under a program directed by the Government of South Vietnam. Requests for these operations generally originate at the district or provincial level and are submitted through territorial administration command channels. The herbicide spray plan, includes as a minimum the area requested to be treated with herbicide, the public information, civil affairs, and intelligence annexes, along with a statement by the province chief that he will see that just and legal claims are paid for any accidental damage. The ARVN corps commanders and their U.S. corps senior advisers have been delegated authority to approve small scale defoliation by ground-based spray and by helicopters. All requests for crop destruction and larger scale defoliation by C-123 aircraft are forwarded to the Vietnamese Joint General Staff. Upon approval of the request by the Chief of Joint General Staff it is forwarded to the MACV staff for final review.

The MACV staff position is developed as the result of coordination with CORDS (Civil Operations and Revolutionary Development Support), USAID, and political representatives at each level where they exist. An aerial reconnaissance is conducted as the next step to insure that all populated areas and friendly crops have been excluded from the target area. Having determined from this aerial survey and an analysis of the military worth that the project is a valid herbicide target, the project is forwarded to the U.S. Ambassador and COMUSMACV for approval. The Ambassador personally approves all C-123 defoliation projects and all enemy crop destruction projects.

SOME SPECIFIC USES OF HERBICIDES

Some specific uses of herbicides are:

1. *Defoliation of base perimeters*

A portion of the small-scale ground based or the helicopter spray missions are used in improving the defense of base camps and fire bases. Herbicides are a great help in keeping down the growth of high jungle grass, bushes, and weeds which will grow in cleared areas near these camps. This clearance opens fields of fire and affords observation for outposts to prevent surprise attack and as such is truly a life-saving measure for our forces and our allies. Without the use of herbicides around our fire bases, adequate defense is difficult and in many places impossible.

2. *Defoliation of lines of communication*

There are many instances of ambush sites being defoliated for better aerial observation and improved visibility along roads and trails. In 1967 there were also many requests for defoliation of VC tax collection points. In otherwise friendly territory there were points along well-traveled routes where the enemy could hide under cover and intercept travelers to demand taxes. Defoliation along these roads was very effective in opening these areas so that they can be seen from observation aircraft, and with few exceptions these roads were opened to free travel. The use of aircraft to spray alongside lines of communication proved valuable in clearing these areas and preventing costly ambush of army convoys with resulting friendly casualties.

3. *Defoliation of infiltration routes*

Areas used by the enemy for routes of approach, resupply or movement are targets for herbicide spray. Probably the most valuable use of herbicides for defoliation is to permit aerial observation in such areas. This is particularly true in areas near the border so that we can detect movement of enemy units and their resupply.

4. *Defoliation of enemy base camps*

We know from prisoners of war and from observation that the enemy will move from areas that have been sprayed. Therefore, enemy base camps or unit headquarters are sprayed in order to make him move to avoid exposing himself to aerial observation. If he does move back in while the area is still defoliated, he will be observed and can be engaged.

5. Crop destruction

Crops in areas remote from the friendly population and known to belong to the enemy and which cannot be captured by ground operations are sometimes sprayed. Such targets are carefully selected so as to attack only those crops known to be grown by or from the VC or NVA. The authorization to attack crops in specific areas has been made by the U.S. Embassy, Saigon, MACV and South Vietnamese Government.

Frequent reviews have been conducted of the herbicide program. The most recent one was personally directed and reviewed by COMUSMACV in October 1968 to assure himself that the program was militarily effective. Prior to that, the U.S. Ambassador had directed a review which looked at the political and economic aspects of the program. The Embassy report was released in August 1968. The crop destruction program was also reviewed by the CINCPAC scientific adviser in December 1967. Each of these reports concluded that the program should be continued.

Mr. ZABLOCKI. At this point, will you supply the Embassy report and the CINCPAC scientific adviser report for the fiscal year 1967 if you have it?

Admiral LEMOS. I do not have them with me, but I will supply them.

(The reports, which are classified, were provided to the subcommittee for its records.)

The requests for defoliation and crop destruction have always exceeded our capability to spray. The requirement continues although a tapering off should develop if enemy activity subsides. A recent review by MACV indicated that operations for 1970 will be less than in 1969. In addition, Rome plows are replacing defoliation for clearing along many lines of communication.

THE USE OF 2,4,5-T IN VIETNAM

With regard to the recent publicity of the herbicide agent, 2,4,5-T, which is a component of orange, a herbicide mixture, the bionetics research laboratories conducted a study of the carcinogenic, teratogenic and mutagenic activity of selected pesticides and industrial chemicals for the National Cancer Institute during the period 1965-1968. The study indicated that a large dose of 2,4,5-T administered orally to specific strains of mice during the central portion of the gestation period produced abnormal fetuses.

However, on October 29, 1969, Dr. DuBridge, science advisor to the President, stated, "It seems improbable that any person could receive harmful amounts of this chemical from any of the existing uses of 2,4,5-T."

Nevertheless, Deputy Secretary of Defense David Packard has issued instructions to the Joint Chiefs of Staff to reemphasize the already existing policy that 2,4,5-T be utilized only in areas remote from population.

When the American Embassy conducted the political economic review of the herbicide program, it requested that a disinterested expert be sent from the United States to assess any ecological consequences of the program. Dr. Fred Tschirley, Agricultural Research Service,

Department of Agriculture, was sent over in March 1968 for a 1-month period. Arrangements were made which permitted him to fly over any area of Vietnam he wished to inspect plus on-the-ground visits to any safe area. He concluded that the defoliation program had caused some ecological changes. Although single treatment on semideciduous forest would cause inconsequential changes, repeated treatments could kill enough trees to permit invasion of many sites by bamboo. The presence of bamboo would then retard regeneration of the forest.

The Army supports the need for a more detailed investigation of the ecological effects of herbicides used in Vietnam. Such an investigation should be conducted in coordination with other interested agencies. In order to get such a study started, a research and development project entitled "Ecological Effects of the Military Use of Herbicides in Vietnam" is being initiated. This study would continue into the post-hostilities phase.

EXAMPLES OF DEFOLIATION SUCCESS IN VIETNAM

In the final analysis the sole purpose of the herbicide program is to protect friendly forces and conserve manpower. The following examples should demonstrate the success of the defoliation effort in Vietnam:

1. Major defoliation has been accomplished in war zone C. Prior to defoliation, seven brigades were necessary to maintain U.S./GVN presence. During 1967, after defoliation only three brigades were required.

2. The commander of naval forces in Vietnam in a report to General Abrams stated—

As you know, a major concern is the vegetation along the main shipping channel. Your continuing efforts under difficult and hazardous flying conditions, in keeping this area and the adjacent inland areas devoid of vegetation have contributed considerably in denying the protective cover from which to ambush the slow-moving merchant ships and U.S. Navy craft.

3. In 1968, the commanding general of the 1st Field Force reported—

Defoliation has been effective in enhancing the success of allied combat operations. Herbicide operations using C-123 aircraft, helicopters, truck mounted and hand sprayers have become an integral part of the II CTZ operations against VC/NVA. The operations are normally limited to areas under VC/NVA control remote from population centers. The defoliation program has resulted in the reduction of enemy concealment and permitted increased use of supply routes by friendly units. Aerial surveillance of enemy areas has improved and less security forces are required to control areas of responsibility. An overall result of the herbicide program has been to increase friendly security and to assist in returning civilians to GVN control.

4. The U.S. commander in the III CTZ related:

Herbicide operations have contributed significantly to allied combat operations in the III Corps. Defoliation is an important adjunct to target acquisition. Aerial photographs can often be taken from which interpreters can "see the ground" in areas that previously were obscured. Defoliation also aids visual reconnaissance. U.S. Air Force FAC's (forward air controllers) and U.S. Army aerial observers have discovered entire VC base camps in defoliated areas that had previously been overlooked.

5. In the south in the IV CTZ, C-123 herbicide operations are limited. This is because of the vast areas of valuable crops which are not to be destroyed, even though they may be in enemy hands. There-

fore, the commander of the IV Corps area in presenting his evaluation cited the value of helicopter operations as follows--

A significant helicopter defoliation mission was conducted in the vicinity of SADEC in August 1968. The target area consisted of three main canals which converged and formed a strong VC base. The dense vegetation permitted visibility of only 10-15 meters horizontally and nil vertically. The area was sprayed with approximately 735 gallons of herbicide white and over 90 percent of the area was defoliated. As the result of the defoliation, an ARVN battalion was able to remain overnight in the area for the first time in 5 years. Many enemy bunkers were open to observation. Since the defoliation, the VC presence has decreased to the point that only RF/PF forces are now necessary for local security.

6. As a part of the 1968 evaluation report of herbicide operations, the U.S. senior adviser in the IV Corps tactical zone area reported--

A section of National Highway 4 in Phong Dinh Province was the site for a defoliation operation on June 24, 1968. Since January 1968, a series of ambushes was conducted against SVN convoys and troop movements. Because of the total inability of ground troops to keep the area clear of VC, this area was sprayed using 685 gallons of herbicide white. The target area was primarily coconut palm and banana trees that had been abandoned by their owners for several years. During the period of abandonment the vegetation had become so dense that convoy security elements were not able to see more than 5 meters into the underbrush and had to rely on reconnaissance by fire to discover the hidden enemy. This method of protection had proven ineffective. Three RF/PF companies with U.S. advisers were used to secure the target for the helicopter operation in addition to an armored cavalry troop. Since the defoliation mission was completed, convoys have used the highway two or three times a week without attack or harassment. Only one RF platoon has remained in the area to provide local security to the hamlet and highway.

7. In certain instances, we know the VC have been forced to divert tactical units from combat missions to food-procurement operations and food-transportation tasks, attesting to the effectiveness of the crop destruction program. In local areas where extensive crop destruction missions were conducted, VC/NVA defections to GVN increased as a result of low morale resulting principally from food shortages.

The most highly valued item of equipment to field commanders in Vietnam is the helicopter. There was some question when the helicopter spray equipment was first procured whether field commanders would divert the use of helicopters from combat operations for herbicide spray operations. The very fact that the commanders have used their helicopter spray equipment to the fullest and have asked for more is certainly proof that herbicide operations have been helpful in protecting the American soldier and contributing to successful accomplishment of the ground combat mission.

CONCLUSION

Gentlemen, we have presented to you in as complete and candid a manner as possible the lifesaving usage that we have made of riot control agents and herbicides in South Vietnam and the policies under which this usage has taken place. We believe this usage has been wise and has been accomplished with restraint. The result is that our forces have been better able to accomplish their mission with significantly reduced U.S. and Vietnamese casualties.

ADVERSE EFFECTS OF HERBICIDE USE: DAMAGE CLAIMS

Mr. ZABLOCKI. Thank you for your statement, Admiral LEMOS.

You have outlined the uses and the benefits of chemical agents in Vietnam. Certainly there must be adverse political and economic results because of the use of herbicides and tear gases like CS.

Have there not been instances of the misuse of herbicides and tear gas? Could you give a view of those for the record of the subcommittee?

For example, I understand Cambodia has a suit against the United States for damage done because of the use of herbicides. It is also my understanding some South Vietnamese are going to seek damages because of loss of income or loss of property. I understand banana plantations have been destroyed. That would indicate there are uses of chemicals which have been adverse to our interests.

Admiral LEMOS. There have been some such instances.

Mr. ZABLOCKI. Could you tell the committee about how many? You have given all the good side of it. I wouldn't expect you to dwell at length on the reasons why chemicals should not have been used, or where errors were committed, but I think in fairness you ought to tell us a little bit of both sides.

Admiral LEMOS. There have been some few instances and these have been very carefully explored in the reviews that I have mentioned and quite clearly from the results of the reviews it has been determined that in the overall context, the disadvantages and the few abuses were very greatly outweighed by the very real advantages provided to our forces and to the Vietnamese Forces and the very real difficulties they provided the VC and North Vietnamese Forces.

With respect to the Cambodian incident, this was a border incident. As you know, sir, there are stretches of the Vietnamese-Cambodian border that are under dispute. They are not clearly marked in any way. In situations such as this where you know there are enemy base camps, enemy forces operating in the jungle, and from which heavy fire may be coming, spray operations close to the border have been conducted. It would appear that in one of these cases either the spray plane was in an area that was in dispute or was not clearly marked and this situation was reviewed and as I understand it observers were sent to the area and a report has been prepared. Whether that report has been yet released, I do not know. I have not seen it.

HOW CLAIMS ARE PROCESSED AND PAID

Mr. ZABLOCKI. In your testimony, Admiral, you say that the province chiefs supply the basic intelligence as to what areas herbicides should be used in.

Admiral LEMOS. Yes.

Mr. ZABLOCKI. Realizing the political problems between Cambodia and South Vietnam, could this have entered into the selection of the defoliation of areas along the border of Cambodia?

Admiral LEMOS. I am certain it has. As I have indicated, all C-123 spray operations must have the clearance of the Government of Viet-

nam, of COMUSMACV and of the Ambassador. All three must approve C-123 operations.

Mr. ZABLOCKI. You also stated that the province chief must state that he will see that just and legal claims are paid for any accidental damage. Where is he going to get the money?

Admiral LEMOS. To the extent there are damages—

Mr. ZABLOCKI. From my knowledge of the South Vietnamese anything they have is received from us.

Admiral LEMOS. We do provide substantial support to the South Vietnamese. The payments, however, are made by the Government of Vietnam.

Mr. ZABLOCKI. But we pick up the tab?

Admiral LEMOS. Not entirely.

Mr. ZABLOCKI. Could you advise the Congress if we ultimately are going to have war damage claims like we had in the Philippines because of the damage to crops and industry? Do you anticipate there will be such war damage claims?

Admiral LEMOS. I am not able to anticipate that kind of claim.

Mr. ZABLOCKI. In view of the fact that we were the defoliator and, our U.S. Ambassador has been consulted and must give the order for the use of herbicides, wouldn't it be logical that South Vietnamese owners of plantations will be filing claims through the U.S. Embassy the first opportunity they have?

Admiral LEMOS. They have that opportunity now, sir.

Mr. ZABLOCKI. And they are doing so?

Admiral LEMOS. I presume—

Mr. ZABLOCKI. And when hostilities end we will have millions of dollars in claims thrown at us. Has this been taken into consideration by Defense Department when the decision was made to use herbicides?

Admiral LEMOS. I am certain it was taken into consideration.

Part of the reason for the reviews was to consider specifically these points.

INTELLIGENCE ON AREAS DEFOLIATED

Mr. ZABLOCKI. In outlining the elaborate procedures which you have taken in the use of herbicides, in the past, we were impressed—certainly I was—with the lack of accurate and hard intelligence in the Vietcong-held areas.

How sure can the military be that fields that are selected by the Vietnamese province chiefs are in Vietcong-held areas, and how can the province chief know for sure that the crop is going to feed Vietcong soldiers? If we have such excellent intelligence where their Vietcong rice fields are, we should have better intelligence in other areas.

Admiral LEMOS. Intelligence is improving daily, as we move out in the countryside and get more and more hamlets and villages under the control of the Government of Vietnam and more and more people willing to risk their lives to give information that points out where the Vietcong are and where it is difficult to go.

DOD DECISION ON 2,4,5-T

Mr. ZABLOCKI. On page 14, you said that the Deputy Secretary of Defense, David Packard, has issued instructions to the Joint Chiefs

of Staff to reemphasize the already existing policy that 2,4,5-T shall be used in areas remote from population. I thought there was a decision not to employ 2,4,5-T in the future.

Admiral LEMOS. I am told there is no such decision.

Mr. ZABLOCKI. The use of 2,4,5-T is however, under review.

On page 15 you say a review of the ecological effects of the military use of herbicides is now being initiated.

Admiral LEMOS. Yes, sir, that is the whole herbicide program and the ecological effects of all herbicides.

Mr. ZABLOCKI. 2,4,5-T, it is my understanding, is the most potentially dangerous to people, resulting in the greatest political problems. Is that not a fact?

Admiral LEMOS. That is my understanding, yes, sir.

DOD HERBICIDE STUDY

Mr. ZABLOCKI. The herbicide investigation project that you referred to on page 15, could you give the subcommittee more details on this project? It will be conducted by the Department of Defense or contracted out?

Admiral LEMOS. Initially in-house and then go on contract.

Mr. ZABLOCKI. Wouldn't it be preferable to reverse the order and have some uninvolved group study the ecological effects of the military use of herbicides in Vietnam, and then have the military review the report?

Admiral LEMOS. Mr. Hayward you have any comment on that?

Mr. ZABLOCKI. Wouldn't that be advisable?

STATEMENT OF ALBERT E. HAYWARD, ASSISTANT DIRECTOR, CHEMICAL TECHNOLOGY, DEFENSE RESEARCH AND ENGINEERING, DEPARTMENT OF DEFENSE

Mr. HAYWARD. Mr. Chairman, some time ago in our discussions with the American Association for the Advancement of Science, the Department of Defense agreed in principle that this type of survey should be done, and we have every intention of inviting this association, and also of inviting the National Academy of Sciences and other scientific groups, if they would participate in this survey.

The project which Admiral Lemos referred to is being started or initiated now. I believe that our activities during the remainder of this fiscal year will be largely in planning and in reviewing the things that have been done. I can assure you that uninvolved scientific bodies will be invited to participate in this.

Mr. ZABLOCKI. At a later date.

Mr. HAYWARD. Within the next few months.

They should be involved in the planning as well as the discussion, sir. So it will be done within a reasonably short time period.

Mr. ZABLOCKI. Some are hopeful that by then it may be a moot question.

I have a call, will you excuse me? Mr. Fraser . . .

Admiral LEMOS. Surely.

all circumstances to live up to the Geneva Convention if it didn't prove convenient, satisfactory, or necessary?

Admiral LEMOS. All I can say is that all of the efforts against North Vietnam, including our planning of it, were subjected to the very highest review in all responsible agencies of the Government. I cannot conceive of the approval of plans in direct violation of that convention.

Mr. FULTON. But you also said, when I brought up the word "consideration," that there may have been alternative plans under consideration although not used for the bombing of North Vietnam dikes that are for the main purpose of food production.

Admiral LEMOS. Mr. Forman correctly analyzed my problem when he said I misinterpreted what you are saying. There are a number of dams in North Vietnam not directly related to the problem you propose.

Mr. FULTON. We are really trying here to get the basis for the policy that is in effect and the limitations on the policy under international law. So my question is based really on finding out whether the policy just "grewed" like Topsy or it was an express fitting the policy in, the U.S. military, under the Geneva Convention.

That is all, Mr. Chairman.

Admiral LEMOS. I don't know how to answer that question except to say that the military do not of themselves do things in violation of U.S. policy.

Mr. FULTON. No, I agree with you thoroughly, but that's the other side of the coin. I am saying, how did we in the United States as a military decision, arrive at this particular policy? How was the policy arrived at?

Admiral LEMOS. The policy not to bomb?

Mr. FULTON. The dikes of North Vietnam that have to do with food production?

Admiral LEMOS. I am very certain it was arrived at on the basis of consideration of this convention.

Mr. FULTON. So then there were no plans ever as an alternative, by the U.S. military, even considered for the bombing of dikes of North Vietnam that are used primarily for food production?

Admiral LEMOS. In my capacity I can say clearly that I am unaware of any such plans—

Mr. FULTON. May we have the information supplied for the record, Mr. Chairman?

Mr. ZARLOCKI. Very well.

(The information follows:)

Question. History of plans for bombing of dams in North Vietnam as an anti-crop operation?

Answer. (Statement for record). The Department of Defense policy is not to divulge details of military plans.

HOW MANY DEPOLIATION CLAIMS?

Mr. ZARLOCKI. I would like to clarify something. On page 10, Admiral, you list the procedure under which herbicide spray is used. I refer again to the payment of legal claims. "The province chief will see that claims are paid for unjust and illegal damage."

I am not sure when you answered my question earlier, you understood what I meant to ask. On whose behalf was he making that pledge? His Government? Our Government?

Admiral LEMOS. His Government.

Mr. ZABLOCKI. I believe I did ask whether you would supply for the record, Admiral, how many claims have been made.

Admiral LEMOS. I don't recall.

Mr. ZABLOCKI. And what will be the procedure for paying them? I am personally satisfied that if the claims are made to the province chief he will somehow get it to the Saigon Government and they will get to the U.S. Government and we will be picking up the tab. Please supply for the committee this particular answer. It may be a very controversial issue some day.

Admiral LEMOS. Yes, sir.

(The information follows:)

Question. Number of claims submitted for damage from herbicide and crop damage? Procedures for paying these claims?

Answer (statement for record). The US Foreign Claims Commission in RVN has received 49 claims from residents of the RVN in the amount of \$66,816 (US dollars) for herbicide damages. The 43 claims adjudicated so far have been denied either because such damage was combat related or damage observed was not caused by defoliants. Claims against the US Government may be payable for certain accidental defoliation damage resulting from a spray aircraft mishap.

Herbicide claims from Vietnamese and foreign nationals residing in the RVN are normally made against the GVN and are handled in GVN channels. Prior to the initiation of herbicide operations, the respective GVN province chief requests such operations and pledges indemnification for accidental damage to crops and trees of friendly citizens. Procedures require that such claims be initiated at District level and processed to Province headquarters for adjudication up to an amount of 100,000 piasters. (One US dollar equals 118 piasters). Claims of an amount greater than 100,000 piasters are processed to Headquarters, Joint General Staff and the Ministry of Defense for adjudication on a case by case basis. Maximum compensation payment is 500,000 piasters. The GVN programs handle the great bulk of crop damage claims in RVN; however, if a local national insists on filing a claim against the United States because of defoliation damages to his property, his claim is accepted and investigated. The claim and report of investigation are referred to a US Foreign Claims Commission appointed by COMUSMACV for adjudication under the authority of the Foreign Claims Act, 10 USC 2734 and PL 90-521.

Since the defoliation claims program is being kept in GVN channels and an active claims program is being kept in operation by the GVN, an influx of compensable claims against the US Government generated by the potential termination of hostilities is not expected.

Mr. ZABLOCKI. If there are no further questions, on behalf of myself and the entire subcommittee, Admiral, I want to thank you for your excellent presentation and for the direct answers you have given to the questions that were asked of you.

In view of the fact that certain matters are classified which you will supply to the committee for the record, I see no reason to go into executive session.

Therefore, this concludes the hearings of the subcommittee on the international aspects of chemical-biological warfare. The subcommittee will stand adjourned until further notice.

Thank you, Admiral.

(Whereupon, at 12:35 p.m., the subcommittee was adjourned until further notice.)