

AFTER years of secrecy, evasion and even outright denials, the Department of Defence has at last admitted that it carried out an extensive weather modification programme during the Vietnam War. The operation, which took place between March 1967 and July 1972, was designed to increase rainfall over the Ho Chi Minh Trail and make it difficult for the North Vietnamese to move troops and equipment into South Vietnam along muddy roads and jungle trails.

The Pentagon's admission came during top secret hearings held by a Senate subcommittee, on March 20, a transcript of which was made public last week. The transcript reveals that the rainmaking operations were so highly classified that even some senior Pentagon officials were unaware of them, and that there is now a deep division of opinion within the Department of Defence about their effectiveness.

According to testimony given at the hearings by Lieutenant Colonel Ed Soyster, a total of 2,602 cloud seeding missions were flown over Laos, Cambodia and North and South Vietnam, and 47,409 cannisters of silver and lead iodide were expended during the five-year programme. The objective was to supplement natural rainfall during the normal rainy season, and to extend its length, thereby causing landslides, washing out bridges and generally turning trails into a sea of mud.

Although it has been rumoured and reported in newspapers for about three years that the United States indulged in rainmaking operations during the Vietnam War, the extent of the programme revealed during the Senate hearings has surprised many observers.

The operations resulted from an extensive test carried out in October 1966 in Laos. According to Soyster's testimony, 56 cloud seedings were conducted, with a success rate of more than 85%, and the Commander in Chief of Pacific Operations concluded that rainmaking over the Ho Chi Minh Trail "could be used as a valuable tactical weapon". Operational cloud seeding missions began on March 20 the following year.

An air force base in Thailand was used for the operation which was carried out with weather reconnaissance aircraft. In short, cloud seeding consists of dropping burning photoflash-type cannisters into an updraft in a cloud mass. As the cannisters burn, silver iodide or lead iodide is produced and this acts as a seeding agent, causing drops of moisture to form in the cloud, which eventually fall as rain. The entire military rainmaking operation cost about \$3.6 million a year.

Pentagon admits Vietnam rainmaking

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Initially, the area chosen for cloud seeding consisted of South-eastern Laos and a small area of North Vietnam, but later in 1967, operations were extended into North Vietnam and a small region of South Vietnam. Finally, in 1972, portions of Cambodia and a larger region of South Vietnam were included.

All cloud seeding activities over North Vietnam were, however, halted on November 1, 1968, the day that President Lyndon Johnson ordered a bombing halt, and they were never reinstated. And the entire operation was ended on July 5, 1972—just two days after the *New York Times* published a lengthy account of the Pentagon's rainmaking activities.

Soyster told the committee that although it was usually possible to seed every cloud within a target area, priority was given to seeding clouds directly over roads, intersections and river crossings, which indicates an accuracy for the operation far greater than many independent observers believe possible.

How successful was the programme? According to Soyster, the Defence Intelligence Agency calculated that "rainfall was increased in limited areas up to 30% above that predicted for the existing conditions". He added that sensor recordings of movement along the Ho Chi Minh Trail "indicated enemy difficulties from heavy rainfall", and said that in April 1971 there were about 9,000 enemy logistic movers in Laos each week, but by the end of June the number had dropped to 900. The greatest decreases in troop movements came during the first week in June, when a typhoon struck the area, and during the third week in June, when the Pentagon's rainmaking activities were at their height.

The Pentagon's admission that it has indulged in weather modification came after persistent attempts by Senator Claiborne Pell, a Rhode Island Democrat, to get at the facts. Pell, who is Chairman of the Subcommittee on Oceans and International Environment of the Senate Foreign Relations Committee, proposed a resolution which the Senate passed last year by a vote of 82 to 10 calling on the United States Government to launch international negotiations aimed at banning weather modification as an instrument of war, and it was his subcommittee which held the top secret hearings on the military rainmaking operations. The transcript

of those hearings was declassified by Secretary of Defence James Schlesinger.

Details of the rainmaking operations were held in strict secrecy, presumably because of the sensitivity of the programme. According to Soyster, individual mission reports were transmitted through special communication channels to the joint chiefs of staff, who made periodic reports to the Secretary of Defence and the White House.

Furthermore, since reports and rumours of the operation appeared in the press, the Pentagon has been more than evasive on the matter. During hearings held by the Senate Foreign Relations Committee in April 1972 for example, then Defence Secretary Melvin Laird was asked whether the military had ever indulged in rainmaking activities. He replied: "We have never engaged in that type of activity over North Vietnam", but in January this year he wrote to the committee to apologise for his mis-statement, saying that he was unaware of the weather modification operations carried out over North Vietnam by the Johnson Administration. He was, of course, fully aware of the rainmaking activities he had authorised over Laos, Cambodia and South Vietnam, but simply evaded any mention of them.

The Pentagon's obsession with the secrecy of the programme was taken to its final extreme in 1972, when it refused even to supply details of the operation to an interagency task force chaired by Herman Pollack, director of the bureau of international scientific affairs in the Department of State, which was trying to develop administration policies on both military and civilian weather modification. Although that study itself was classified, the Pentagon has now admitted that the rainmaking operations were so heavily classified that it refused to turn over any information to Pollack.

Since the skies over South-east Asia were raining high explosives and all manner of unsavoury weapons during the Vietnam war, why did the Department of Defence choose to hide the fact that it was tinkering with the weather? One reason is that the whole area of weather modification is a sensitive one simply because it is a new area of warfare which may eventually open up some frightening possibilities.

As Pell puts it, "We should not open the Pandora's box of harnessing nature, of changing the weather or developing techniques to create typhoons or earthquakes with devastating effects upon foes and neutrals alike. I believe this new kind of weaponry should be eschewed by developed, so-called civilised nations".