

Strategy for the Air War

By **GROUP CAPTAIN H. R. FOOTTIT**

"We are going to have to be prepared every day, every year for a long time to come."

—General Charles Foulkes

TO-DAY IT sounds fantastic. Imagine a war that lasted for 100 years: imagine people being born, raising their families and dying without ever feeling free from the fears of conflict. Yet this happened. It took place in the reign of Edward III of England and it was later called "The Hundred Years War." The foundation for the war was built partly around a squabble over the wool trade and partly

around a squabble over national allegiances. According to history, in the year 1337 Edward of England defiantly threw down the gauntlet and repudiated his allegiance to King Philip of France. This meant war.

Although the fight started with running sea battles in the English Channel, the first real offensive did not get going until 1340, three years later. At that time a rejuvenated British fleet swept the French from the sea and an English army stormed ashore on the French coast under a hail of arrows. When the fire of this offensive died out, it took the British a further six years to launch a new amphibious operation. Thus it wasn't until 1346 that another English army sought its fortunes in France. This campaign ostensibly culminated in the famous Battle of Crecy, fought in the dying light of August 26th. Here for the first time the English with their long bows mowed down a French army three times their size and foreshadowed

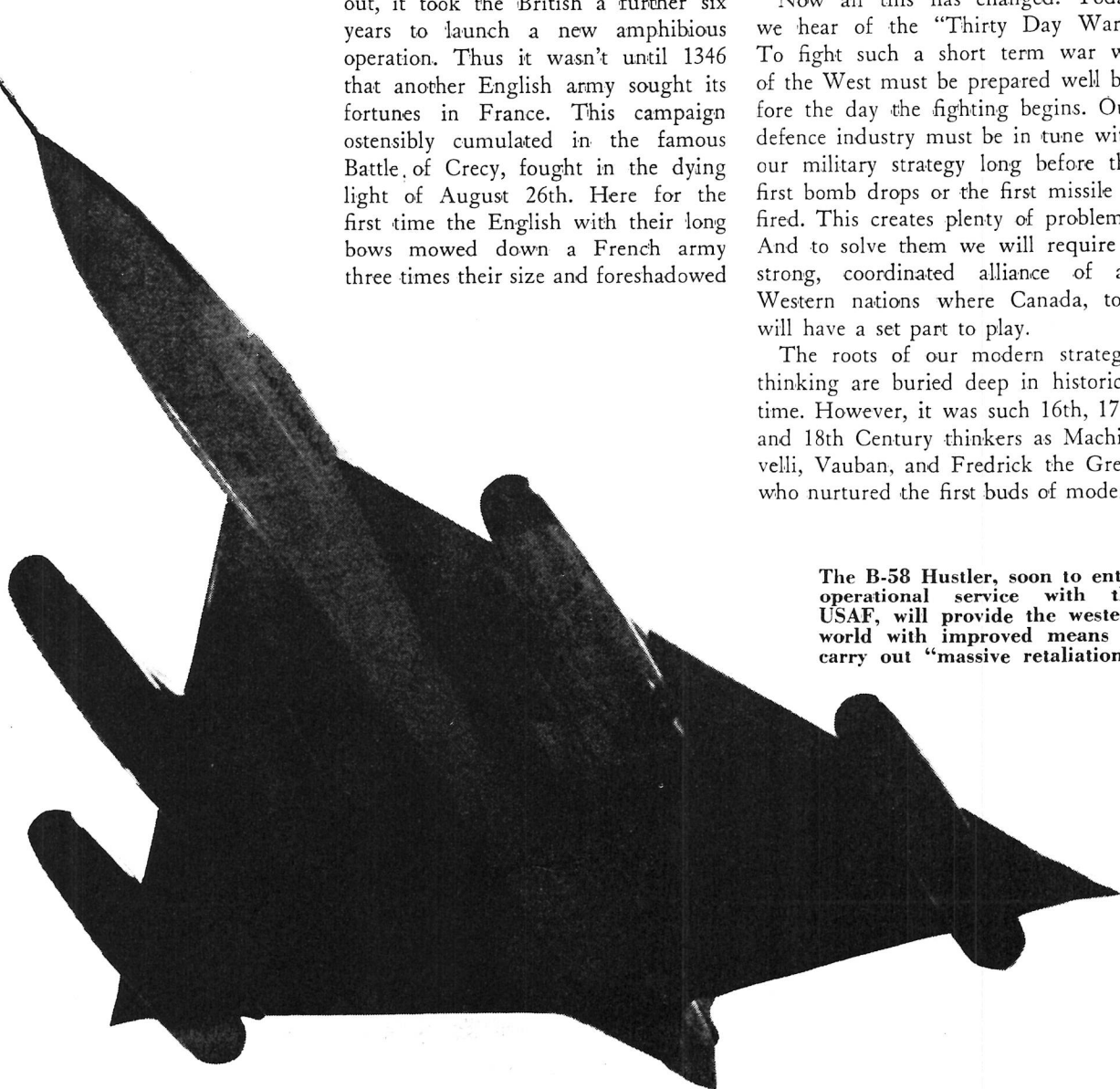
the eventual doom of the cumbersome knights in armour.

Leisurely Process: Although the name "Hundred Years War" is really a history book term, since a peace treaty was never signed, it is apparent that this 14th Century fighting was a leisurely process. It literally took years to raise large armies and navies and bring them to battle. The defence industry of those days could merely wait until war was declared before they started to manufacture their bows, arrows, armour, sloops and ships of the line.

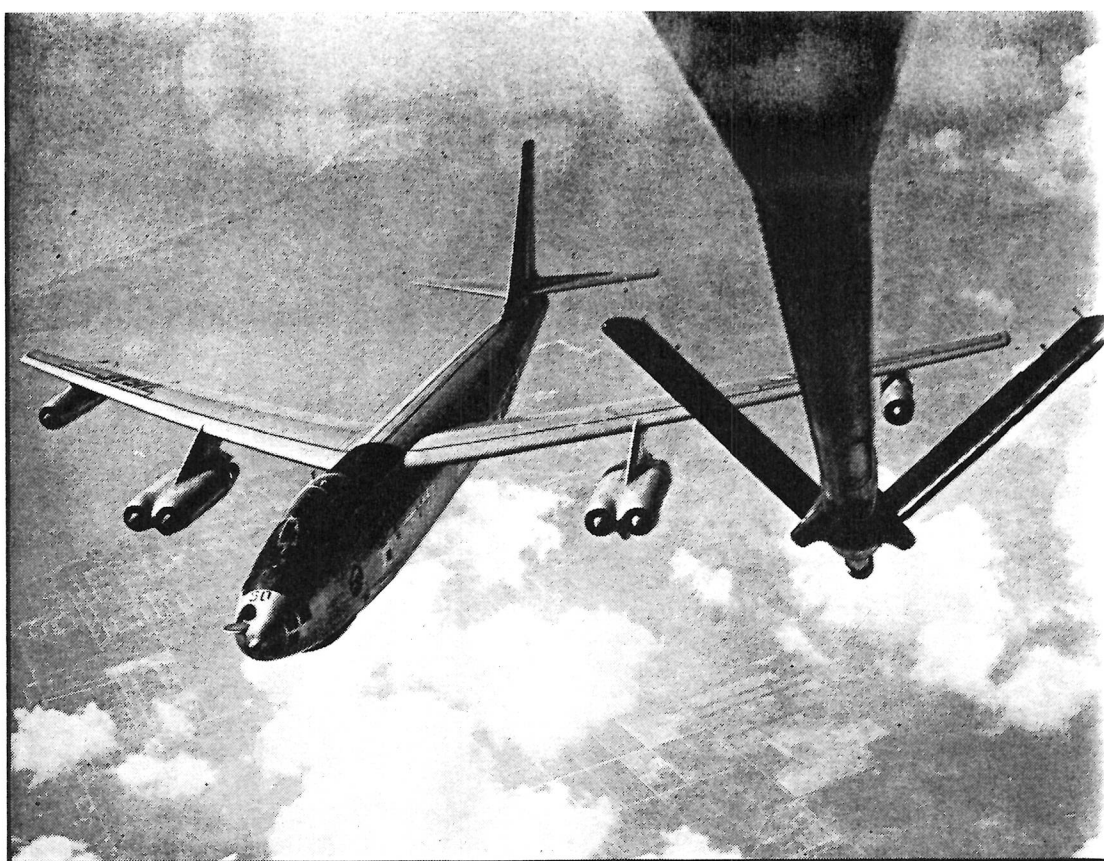
Now all this has changed. Today we hear of the "Thirty Day War." To fight such a short term war we of the West must be prepared well before the day the fighting begins. Our defence industry must be in tune with our military strategy long before the first bomb drops or the first missile is fired. This creates plenty of problems. And to solve them we will require a strong, coordinated alliance of all Western nations where Canada, too, will have a set part to play.

The roots of our modern strategic thinking are buried deep in historical time. However, it was such 16th, 17th and 18th Century thinkers as Machiavelli, Vauban, and Fredrick the Great who nurtured the first buds of modern

The B-58 Hustler, soon to enter operational service with the USAF, will provide the western world with improved means to carry out "massive retaliation".



The West's ability to strike back is presently vested in such well known bombers as the B-47 Stratojet shown here about to be flight refuelled.



military theory. These were brought to full flower by the great German strategist Karl von Clausewitz who lived in the Napoleonic era at the turn of the 19th Century. Clausewitz joined the Prussian army at an early age and worked up through the ranks until he became a General. He served in various field and headquarters positions in the Prussian army, and for a short period with the Russians. But it was not in his field tent nor behind his staff officer's desk that he contemplated his long experience in war. Instead he liked to sit down in the evening in his wife's sedate drawing room and ponder over his work. He was a voluminous writer. When his notes were published after his death in 1831 they were bound into ten separate volumes, of which the most famous is entitled simply "On War."

Fundamental Types: Clausewitz sifted the evidence and isolated two fundamental types of war. These types are in the spotlight of attention even today, since they form the foundation for the build up of our air power. The first type of war is the *Unlimited War*. This is what we now call Total or Global War. This is a war, such as World War II, where the object is to annihilate the enemy in a series of battles that may extend from one corner of the earth to another. The other type of war that Clausewitz noted was the *Limited War*. This is a

war that has limited objectives and is chained to a small section of the globe as the Korean and Egyptian conflicts were.

Since limited and unlimited wars essentially require emphasis on different types of air forces, the nations of the West, in this Cold War era, must provide the men and equipment to fight both types of war. For the large Western democracies, the U.S. and the U.K., the bills for stockpiling this all-round defence stagger the imagination. U.S. Defence Secretary Neil McElroy has estimated that the total military budget in the U.S. for the next fiscal year will be "close to the \$40 billion mark."

For smaller countries like Canada such vast sums are beyond the budget. Consequently we have to decide whether we will build up all the air forces required for both types of war, but provide them in small packages, or whether we will merely fill in some of the forces and let our allies in the Western World fill in the rest. Canada has already decided on the latter course of action. As General Charles Foulkes, Chairman of the Canadian Chiefs of Staff told our Industrial Preparedness Association in September, 1956.

Collective Defence: "In alliance with NATO, it is possible to achieve collective defence along the most economical lines, by allowing each partner to contribute the kind of forces it can

best produce and equip, and not requiring each partner to have in existence all types and varieties of forces; in other words, small countries like Canada are not required to have complete and balanced forces in miniature, with all the elaborate administrative organization which is required by world powers, such as the United Kingdom and the United States."

General Foulkes then went on to tie industry into this broad policy. Said he, "We can do our share in the Alliance by raising, equipping and training the type of forces which suits us best and which can be supported in the main from our own Canadian industry."

In the past year or more since these statements were made it is apparent that there are cracks in the wall of Canadian public opinion on the matter. From speeches and articles by such well known Canadians as retired Generals Guy Simmonds and W. H. S. Macklin there is some disagreement on whether the forces we raise should be aimed at fighting the limited war or the unlimited war. This uncertainty has even spread to Parliament. When the Department of National Defence budget for 1957-58 was debated in January of this year, there were "lingering doubts" in the minds of the members. According to the *Montreal Gazette's* columnist Arthur Blakeley, "No one seemed to be entirely



Canada's contribution to the strategy of the West is made up of weapons to fight a "limited" war, including the Canadair Argus (below) and stalwart Avro CF-100 (right).



pleased with the spending program finally approved by Parliament. But no one seemed to be able to devise any better program to replace it. Ideas respecting the kind of defence which Canada should adopt in the post Sputnik age were few and far between. So the program was passed, finally, in its slightly amended form. But the lingering doubts remain."

Canada's Place: From the air power side, Canada's policy, strategy, and industry are heavily weighted to fighting the unlimited, total war. To dissolve the doubts about these forces—or at least crystallize them—I think it is necessary to review a few basic military principles. To begin with, strategists in the past have divided any single war into three broad phases which follow and overlap each other. The first of these is the *Build-Up Phase*, where the war is underway,

there is a general mobilization and build up of manpower and industry, and the early battles are being fought. This is followed by the *Decisive Phase* where the forces are essentially in being and deployed, and the major offensives, that will finally decide the outcome, are being battled out. After this comes the *Mop-Up Phase*. Here the victor of the Decisive Phase pushes back, defeats, and mops up the remnants of the loser's force.

After World War II, in both the European and Japanese theatres, all these phases were plainly visible. In the Build-Up Phase the forces of Hitler and Hirohito swarmed over the land, sea, and air pushing out the boundaries of empire. In the meantime the Allies were resisting and building up their counter forces. In due course, with the enemy's expansion at its extremities, the Allies, Germans and Japanese

fought the Decisive Phase—and the enemy lost. It was then only a matter of time before Germany and Japan would fall in defeat. So gradually the Mop-Up Phase came into effect. Germany finally surrendered when the Allies forced the door of her homeland and swarmed over the countryside, and Japan gave in as the U.S. invasion of her home islands was imminent.

With our present strategic concept the West has put first priority on armaments for these unlimited wars. This is based on the principle that the Korean brushfire type of limited war will not bring our civilization crashing down over our heads even though we lost the war. But defeat in global war would, just as it did for Germany and Japan. Moreover our strategy, forces and industry are tuned to the harsh note that today's Cold War is actually the Build-Up Phase of a normal unlimited war. From past principles this phase was not supposed to start until after the declaration of war.

Starting Signal: However, today we think that any global war would probably begin with the whine of an air raid siren and not a formal declaration. Consequently the start of the war would also signal the start of the Decisive Phase. The West believes that this phase would be short, probably lasting a mere thirty days. Thus we have the "Thirty Day War" that is founded on the destructive capacity of modern thermonuclear weapons. These, as everyone knows, are so powerful that they can reduce large areas to rubble in a few weeks. In addition the range over which these weapons can be delivered has been vastly extended since World War II. At present the manned bomber can carry them several thousand miles. Tomorrow it will be the missile.

With these tools in his military satchel we believe that the enemy would immediately strike through the air at the heartland of North America where our industry forges our weapons of war. Since it is part of our Western heritage that we will not start a modern war, we must be prepared to parry this first thrust and then counter it. If we failed, then in thirty days we would be left with a devastated land reeking in radiation. And the

(Continued on page 55)

tween the wing and the aileron, bringing it into conformance with the relatively small gap on the underside.

Installation of the gap strip makes aileron control effective during conditions when the aircraft is stalled. This eliminates the so-called "uncontrollable roll" which is frequently associated with stalls in this aircraft. Another advantage is increased safety in the event of a single-engine go around.

AirResearch's Aileron Gap Strip has been approved by the CAA for all weights up to and including 26,900 pounds.

FOOTIT

(Continued from page 10)

enemy would begin the Mop-Up Phase. No one, as yet, has firmly fixed on how this final phase would be fought, nor how long it would last. Either we would give up at the end of the Decisive Phase or some type of mop-up action by the enemy would be necessary.

Of course we have no idea of letting any such fate befall us. In the first place Western strategy is keyed to a policy of preventing unlimited war by having in being "the deterrent." If this fails then the strategy of "massive retaliation" will be brought into play. In both cases the sword of this strategy, as General Gruenther called it, is the strategic bomber forces of the U.S. and the U.K. These forces are presently equipped with manned bombers: the B-47, the B-52, the Vulcan, and in due course, the Victor. In time they will stockpile long range missiles in their arsenals. With this strategic air power the West hopes that it will deter any enemy from making an atomic attack. But if this fails then massive retaliation will be aimed at the

enemy's homeland. Strategic Air Command bombers will strike at the core of his industrial and military strength.

Defensive Shield: However, it takes a shield as well as a sword to gird for this modern war. In a U.S. study called "Project East River" retired General Otto Nelson pinned down the basic defensive shield that is vital to survival in global war. First, he said, there must be adequate warning that the enemy's air power has penetrated our North American defence lines; then we must have a strong air defence to resist and divert his forces, even though anything near total defeat is out of the question; and lastly we must decrease the vulnerability of our cities and industries, probably with a strong civil defence corps and dispersion of peoples and factories.

Canada's air power contributions are to the shield for this unlimited war. These are our radar chains which stretch across the land and the RCAF's Air Defence Command. Canadian industry and the Government are geared to supporting this effort. For example, Avro Aircraft Ltd., and a host of prime and subcontractors, are building the CF-100 fighter which is the main stay of our present aerial weapons. In the future these companies will band together to produce in quantity the new supersonic, manned interceptor, the Avro Arrow which will replace the CF-100. The Arrow will be armed with Sparrow air-to-air missiles built by Canadair Ltd. In due course, no doubt, ground-to-air missiles, such as the Boeing Bomarc, will be added to our air defence arsenal. In the meantime the Defence Research Board is cooperating with the U.S. in collecting basic data that might be used to devise a weapon to counter any intercontinental ballistic missile that might be

fired at this continent.

In addition we have built up an RCAF Air Division that uses Canadair built F-86 Sabre fighters, and Avro CF-100 interceptors. Although this Division flies and fights with NATO's tactical air force—basically a limited war force—it is really a part of our unlimited war contribution. This is because it is impossible to visualize a Russian attack on Western Europe, where the Air Division stands guard, without it developing into total war. It is readily apparent, then, that a large portion of Canada's air effort, in the military and in the industry, is tied to a part of the West's "unlimited war" strategy. General Foulkes has summarized our current thoughts. "There will be no time for mobilization," he said, "so that our old concept which we may have in our minds about the Second World War, whereby we took three or four years to assemble our might, is a thing of the past. Along with this the need for large stockpiles of equipment and materials; for production lines in operation ready to be speeded up on mobilization, have now very little place in our current planning. Preparedness for war is going to be a continuous process which will always be with us."

Growing Unrest: Obviously General Foulkes words are tied in with the Decisive Phase of our Unlimited War Strategy. Though we are thinking this way, there has been a growing unrest in the U.S. over the forces for limited war, which, you might say, have been given second priority in Western thinking. Two recent U.S. groups, the Rockefeller Fund Panel and the Gaither Committee, urged that major efforts be made to ensure a top capability for fighting the limited war. "What," the critics ask, "is Canada doing about forces for this type of

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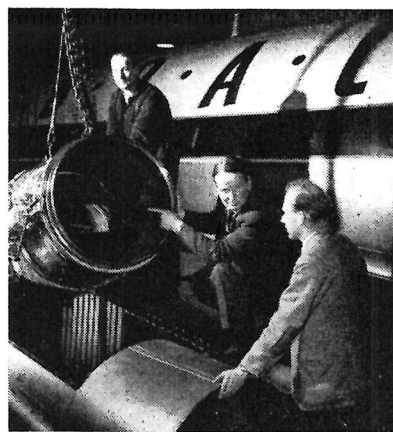


war?"

From the air side, limited war forces have not been completely neglected. However, in line with our policy of not supplying all types of forces for all types of wars, they have not been completely built up either. Limited wars will probably be fought more in the conventional mode. There should be a Build-Up Phase after the war is started, then a Decisive Phase, and finally a Mop-Up—or even a stalemate as in Korea. In the first phase we would probably plan on speeding up our aircraft production lines just as we did in World War II. This is just opposite to our unlimited war thinking. Then we will need transport airplanes to get troops and urgent supplies to the operating theatre; we will need maritime aircraft to help keep the sea lanes open; we will need reconnaissance airplanes and a tactical air force to aid the army; and many other types of conventional craft.

Canada's industry has already supplied some of these airplanes. Canadair produced the North Star military transport and de Havilland of Canada designed and produced the Otter and the Beaver. Now these companies, and associated contractors, are working on two new transports. At Canadair the RCAF's CC-106, a large version of the Bristol Britannia with Bristol Orion turbo-prop engines, is taking shape on the drawing boards. Similarly at de Havilland the twin engined, small military transport, the CC-108, "Caribou", is now moving along in the shop. For the RCAF's Maritime Air Command, Canadair is building the CP-107 "Argus" patrol plane. The RCAF has already accepted an early aircraft for test purposes and the Argus will be in actual maritime operations later this year.

Insufficient: Compared to the Canadian military and industrial effort in air defence for unlimited war, these forces for limited war are insufficient. In fact, it can be argued that even these are aimed at the global war. Even transports would have some use on airlifts, and the maritime patrol airplanes would be used to battle missile-carrying enemy submarines. Essentially, however, these would be minor chores in the Decisive Phase of a major war, though they could and would be used during the Mop-Up. With these small limited war



COMET REVERSE THRUST: John Cunningham, de Havilland Chief Test Pilot, is seen examining the first thrust reverser on a jet airliner. The Rolls-Royce reverse-thrust units are installed on the two outboard Avon engines of the development Comet.

forces Canada's usual air role, when some brushfire war breaks over some far off horizon, is to despatch Air Transport Command to help with the airlift. This we have done with our North Stars during the Korean conflict, and with our Dakotas, C-119s, and Otters, during the aftermath of the Egyptian campaign when the United Nations stepped in to maintain an uneasy peace.

It is true, of course, that the RCAF has other facilities, such as Training Command, Search & Rescue units, and a small Tactical Air Command that works with the Canadian Army. But basically and broadly we have aimed our air power, our strategy, and our industry at the target of unlimited, global war. We have even focused our attention relative to our air forces, our production, and our stockpiling around the Decisive Phase of this conflict, the "Thirty Day War." For this, as General Foulkes has said, "We are going to have to be prepared every day, every year for a long time to come." Is all this wrong? I don't think so. As long as our NATO Alliance is strong and our efforts are coordinated with those of our allies, we have filled in an essential, nationalistic part of the unlimited-limited air war picture. Our NATO partners will have to fill in the rest—whatever it is.

FIREBRAKE

(Continued from page 14)

ment Station), at the University of California, took note of this early work

as they explored the possibilities of various chemicals for fire control use. During their laboratory tests there were indications that various borates possess considerable promise for field use. Other materials such as calcium chloride, mono-ammonium phosphate and sodium bicarbonate also offered some hope.

Further research followed when the tremendous damage and loss to the forests and watersheds of California became such as to demonstrate the need of newer and more effective fire-fighting tools. The increase in cooperative research programs on wild land fire control and efforts culminated in 1954 with "Operation Fire Stop" at the Camp Pendleton Marine Base in Southern California. Under the leadership of the U.S. Forest Service, the U.S. Marine Corps, and the California Division of Forestry, government and industry pooled manpower, equipment, and supplies for extensive tests of new fire control techniques and methods. One phase of "Operation Fire Stop" was devoted to a study of chemical fire retardants. The initial field tests were conducted during controlled burning of grasslands and brush. A combination of sodium borate, boric acid, and calcium chloride emerged as the most promising material. Its performance resulted in the testing of the present chemical, sodium calcium borate—Firebrake.

Trial by Fire: Through the cooperation of the U.S. Forest Service, Firebrake was then tested on actual fires in California's wide range of climate, terrain, and soil types. The field investigations were supervised and evaluated by the California Forest & Range Experiment Station. The results are reported in two station publications; Forest Research Notes Number 105, "Chemical Fire Retardants for Wild Land Fire Control," and Technical Paper Number 15, "A Chemical Fire Retardant."

Firebrake was first featured in aerial attacks on California Fires in 1956. Its performance and advantages led to its use in 1957 on many potentially serious fires in other states which possessed serious fire problems. In nearly all cases, the retardant affected or helped to assure control.

To date, the bulk of Firebrake has been applied by "cascading" in a water suspension (a "slurry") from aircraft. Such applications are currently being made from "crop duster" biplanes