



**NATIONAL MUSEUM
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Wings & Things Guest Lecture Series

Airpower in the Korean War

Internationally-recognized aerospace historian Dr. Richard P. Hallion discusses America's first jet-age air war.

It's a great pleasure to be back to Wright-Patt. I came to Wright-Patt in 1986. At that time General Tom McMullen was running Aeronautical Systems Division and I was here through the McMullen, Bill Thurman and Mike Lowe era. It was supposed to be sort of a way point, as I went on and did other things, but I have to tell you, looking back on my career, the time I spent here at Wright-Patt was among the most enjoyable that I spent in my entire Air Force career.

[no sound] the work they did that paid off in the weapons ... foreshadowed the involvement of the Air Force and Wright-Patterson as well in the long watch in Korea that has continued to the present day. It's 60 years since the invasion of Korea by North Korea, and it's a story that's yet unfinished. We don't quite know how this will turn out. We know that we're dealing with a regime that is very calculating in the North. It has the appearances of irrationality. There is some rationality in irrationality in that posture of behavior and Kim Jong Il is certainly proving to be a worthy son to Kim Il Sung, who of course, triggered the original Korean War in collaboration with Mao and Joseph Stalin.

But looking at the Korean War, I think we see this war as a war that involves an awful lot of aspects of the American National Defense story, as certainly as that story has played out since 1945. It was a war like many of the wars that we've fought and were thrust upon us. It was a war that was unexpected. It was a war that was a "come as you are" party, so to speak. We had to produce, improvise and work on a scramble. It was a war that taught us a lot of lessons, and it's a war that I think needs constant study because, as I said, it's still unfinished. We still don't quite know how it will play out.

We just had an episode within the last several months in which North Korea took it upon itself to sink a ship on the high seas and, so far, seems to have gotten away with that. It's quite interesting to see how this may play out ultimately.

So with that, let's launch off and see exactly what happened around the time of the Korean War and then get into the war itself and some the aspects of the conflict and lessons learned that we may pick up from that. The United States had come out of the Second World War, of course, as a supreme, premier power. It had done that with World War I as well. We had been very, very fortunate that in the Second World War, as in the First World War, with the exception of the attack upon Pearl Harbor, with the exception of fighting up in the Aleutians, in what was then American territory, the war largely left us unscathed in terms of our direct geostrategic involvement. As a result, we had a very

powerful, robust economy. We had a very powerful industrial machine and we were very much looking for the same sort of thing that we did in the 1980s at the end of the Cold War. We were looking for a peace dividend. So in the half decade that occurred between 1945 and 1950, we had a number of changes here that really signaled some of the circumstances that would play a role in shaping what happened then with Korea.

We had a tremendous drawdown of American forces. It was a pell-mell drive to drawdown. It was not undertaken in any systematic or organized fashion, much unlike the way that we had a drawdown at the end of the Cold War. As a result, there was a great deal of chaos and disruption introduced into the national defense system. It occurred at the same time that we were having a tremendous transformation in the technology of flight. The airplane had been invented in 1903, of course, by two brothers from right here in Dayton, Ohio. We had had then the progressive refinement of the airplane through the '20s and '30s. We'd had the introduction of the all metal aircraft; the introduction of the high performance model plane; we'd had the refinement of the piston engine and the propeller combinations, but then we'd had something that overturned it all. That was the introduction of high-speed aero-dynamic theory, encapsulated visually in the swept wing and the delta wing. And, of course, we'd had the introduction of the turbojet engine, we had the development of the powerful liquid fuel rocket engine, as well. These all transformed us and gave us a new era of high speed flight, the potential of long-range missiles and then added to that, of course, were two other revolutions that were critically important: one was the atomic revolution that gave us both atomic weaponry and atomic power, and then on top of that the electronic revolution which, of course, has refined everything about the way we do business, including the way this briefing is being presented to you tonight.

We had had, as well, the establishment of a new independent service, and that was, of course, the United States Air Force. Now the establishment of the United States Air Force represented the fulfillment of a dream that went back at least as far as 1917. For those partisans typified by Billy Mitchell, at whose name we should genuflect, who was the most visible symbol of an individual who was championing the cause of an independent Air Force co-equal with the U.S. Army and the U.S. Navy.

We probably would not have had that had it not been for the wartime performance of the Army Air Force under Gen. Hap Arnold. Hap Arnold had been one of those who crafted in the 1930s a tool that was extremely powerful and extremely crucial to the success of the allied victory and as a result he had impressed an individual who was very, very important. That individual happened to be Dwight Eisenhower, who became Chief of Staff of the U.S. Army in the post-World War II era. So when a debate broke out in the Congress in the late 1940s about whether the United States Air Force, or the United States Army Air Forces at that time, should have an independent existence, Eisenhower said yes, absolutely, they had won that right in terms of their performance in the Second World War. Dwight Eisenhower was one of the greatest friends the United States Air Force ever had and we should recognize him as such.

That precipitated at a time of a drawdown in national defense monies and a look to apply money in other directions, that precipitated a very sharp and brutish and nasty roles and missions debate among all the services. It was a very odd debate, but it was encapsulated in the fight that was typified by those who believed in the B-36 for long-range power projection and those who believed in the aircraft carriers. There were many other issues as well: the Army went after the Marine Corps, the Navy was uncertain of its relationship with other services. This was the kind of thing that was very, very divisive and left a corrosive affect that I think to a great degree still affects the joint service relationships in the nation today, and it was played out against a series of very strong global challenges as we saw the predictable world that we had envisioned in 1945 transforming itself into something very unpredictable, very dangerous. We started to see the emergence of what was termed an Iron Curtain and the bipolar structure that we came to know as the Cold War.

Now, what to do, you know, what to do about American power? Harry Truman, a remarkable individual in his own right, Harry Truman launched a presidential committee to study air power and how air power might be applied to meet the needs of the United States. It was called the Finletter Commission and was headed by Thomas Finletter. They issued a report in early January 1948, right after the creation of the United States Air Force, right after the first super-sonic flight. It had this remarkable quote, which I think is really interesting. The statement in the middle is quite powerful, “But it is the Air Force and naval aviation on which we must mainly rely.” There was no question in the mind of the Finletter Commission, and there was no question really in the minds of Truman, and for that matter, presidents afterwards, that if you took a look at the weapon of choice in terms of determining the international balance of power and maintaining this balance of power in the face of rising threats that that had to be the air weapon.

Now let’s put into perspective some of these transformations we talked about. Let’s take a look, for example, at the turbojet revolution. The piston engine, propeller driven airplane had won World War II, but it was obsolescent even at the moment of its victory, and we saw very, very quickly the introduction of turbojet aircraft – we had indeed been fighting them from 1944 to 1945 if you take a look at the Nazi jets. And taking a look at the post-war era as we saw the force structure of the United States and what we would have to do with this force structure, it was quite obvious that we would have to adjust to this new jet era and incorporate jet propulsion into our military forces.

If you look at fighter aircraft qualities, for example, the data that I have shown before you on this slide comes from a comparative Navy flight test evaluation that was made at Pawtuxet River, Maryland, when they took their hottest propeller driven airplane and they put it against one of the new Lockheed P-80 Shooting Stars, and they found, as you would expect, that the P-80 was slower to get off the ground, but boy, once that sucker got in the air, it was a very, very different issue indeed. If we take a look at this in terms of the nature of the development of aerospace technology and the evolution of aerospace technology, I think it’s remarkable that in four years you see a doubling of aircraft flight speeds. The P-51 in 1944 was, roughly speaking, the fastest operational propeller driven American fighter aircraft at that time. It was a remarkable aircraft. The Bell X-1

supersonic research airplane, which of course, admittedly, is just that – a research airplane. Nevertheless, in 1948 you see it flies, obviously, more than twice as fast.

The early turbojets, for all their problems, all their not necessarily high level of reliability, their relatively low thrust levels, their relatively mediocre performance during take off, their inability to do slam starts and movements in the throttle, and things like that, nevertheless if you take a look at them, that early turbojet that produced about three to four thousand horse power was effectively doubling engine power over the best piston engines of the time and beyond 300 miles an hour. When you took a look at the ratios, of course, it was going much beyond this. The early rockets, themselves, were giving you the capability of exceeding the speed of sound very, very quickly.

To put this in comparison for the United States Air Force and the United States Navy – and when we look at Korea, we have to look at both of those constructs -- it's very interesting to take a look just over a decade in fighter aircraft performance. Take a look, if you will, at the leading fighter aircraft design or the cutting edge fighter aircraft design in service of each service at that particular time. This is the transformation in flight that you see: a transformation in configuration, a transformation in propulsion and a transformation in performance.

I think the Navy, in some respects, underwent an even more dramatic transformation if you take a look at top end Navy fighter of 1940 and you compare it in 1950 to the top end Navy-sponsored research airplane, we have the first Mach 2 airplane which will exceed Mach 2 in 1953 – the Douglas Skyrocket – and of course, the qualities of speed that you see there really speak for themselves.

So let's take a look then at this in conjunction with the global perspective. Those five years from 1945 to 1950 were extremely tumultuous, difficult and challenging years. We had a collapse, basically, of the wartime, if you will, era of good feelings between Joe Stalin and the rest of the world and that took down the Eastern European democracies that were formed, shakily, after 1945. By 1948-1949, they were all rolled up. You had the launching of an insurgency in Greece that was a very bitter insurgency that took quite a bit of difficulty to eradicate. We had French attempts, which I think were ill-founded to restore their empire in Indo-China and that led to no small level of misery that we can possibly imagine going all the way through Indo-China into Vietnam, of course. We had a Soviet blockade that launched the Berlin airlift. That was the first great test of the United State Air Force which it met, of course, as you well know, very, very well. We had in 1949 the detonation of a Soviet atomic bomb, thanks in large measure to espionage and what they had learned from us. We had the collapse of the Chiang regime in China, Chiang Kai-shek falling to Mao Zedong. Then we had evidence, thanks to the Vanilla program, a signals intercept program, we had evidence of aggressive Soviet espionage into the United States across all levels of government, into the military, into the industrial community as well. So we really were facing some very, very difficult challenges. Given this, it nevertheless surprises me a very great deal that when we take a look at Korea, it was both unanticipated and unexpected.

Now here's Korea within the regional context. Dean Acheson was Secretary of State at the time and I think, in retrospect, Dean Acheson was probably a reasonably good guy, but, having said that, he dropped one real clanger. In January of 1950 he said that basically the United States' zone of interest and security in the Far East basically passed through Japan, Ryukyus and Okinawa, and obviously, it did not include the Koreans. Did this play a role in accelerating the interest of Mao Zedong and Kim Il Sung and possibly changing the future of Korea in association with Joe Stalin? We don't really know. We haven't seen the papers to any great degree out of the Communist side to know that, but the indications are certainly that it did.

The bottom line is Korean relations which are deteriorated in the two Koreas, and I'll get into this shortly, from the moment of the end of the Second World War in 1945, there had been shooting incidents in the late 1940s, there had been mass attempts at infiltration in the late 1940s, there were provocations on both sides. All this came due in June of 1950 with the North Korean invasion of South Korea. Now, it immediately forced an American response. Now we could talk here about the American response in general, looking at what was in place on the ground, at sea and in the air, but we'll just focus really on the air side. Suffice it to say, the ground forces that were in Korea in 1950 were largely a speed bump. They could not in any sense, on their own, be expected to hold off a North Korean advance, certainly a very powerful North Korean advance. And although some have criticized them for being ill-trained, ill-equipped, perhaps not very highly motivated, I think over time we have come to appreciate that they actually fought just about as well as they could expect to. They performed in many cases quite valorously and fought with great dedication in terms of what they had the capability to do.

If we look at the Air Force in that time period, we had Far East Air Forces under George Stratemeyer, and if you look at the organization at FEAF, the guts of it are really three Air Forces: the 5th Air Force, the 20th Air Force and the 13th Air Force. If we take a look at these Air Forces and the areas, if you will, of responsibility, we see that it carves out very, very nicely, if you will – 20th Air Force, Okinawa; 13th Air Force, Philippines; 5th Air Force, Korea.

We actually had, in terms of the power projection capability that we could project into Korea, we had a relatively balanced force. We had air defense fighters based in Japan and in Okinawa, and of course, we had on-call air power in the Philippines as well. We had a strong force of medium bombers. We had strategic bombers we could call upon, but there was no expectation in anybody's mind really that anything was going to blow loose, which is why this really became very much a "come as you are" party.

If we look at Navy command relationships, we had the Commander of Naval Forces Far East, Admiral Turner Joy, who oversaw 7th Fleet. The 7th Fleet, when it was tasked to go to war very quickly, put together a Carrier Task Force from carrier Division Three called Task Force 77, which operated in the Sea of Japan, and then a support group, a carrier of light escort carriers, either CVEs, or light carriers, CVLs, which tended to operate in the Yellow Sea. They were dedicated, primarily, to work with the Marines on providing battlefield close air support.

You may be more familiar, perhaps, as an audience, with the Air Force side of it so to talk about the Navy very, very briefly before we move on, we basically have a naval force that is like the United States Air Force, very much a force in transition. It has very large numbers of piston-engine, propeller-driven aircraft. It has smaller numbers of newer jet aircraft. It's still operating your World War II level of carrier, the principle carrier being the so-called Essex class carrier of 45,000-ton, 860-foot ships, straight deck, wooden deck. Interestingly enough, no angled deck, none of the attributes we think of with the modern carrier, such as the Nimitz class carrier today, and, of course, a carrier that consumed so much that you had to constantly concern yourself every three days or so with fleet replenishment.

And the Navy's operating under another limitation as well. The Navy, by the way, I have to say overall, I think the Navy performed brilliantly given their structure in Korea and what they faced. But the Navy had some limitations. One of the real limitations was the fact that we had mined the waters of Japan. We had done such a great job with the B-29 mining the waters of Japan that a lot of their passages were still impassable. So the Navy had to work around this with the basing of their ships at Yokosuka. Basically they would have three carriers at sea, two conducting operations, one undergoing replenishment, and another carrier then back in Yokosuka on 72-hour recall if it was actually needed.

If we take a look at Korea -- you're all familiar with the Korean appendix, if you will, on the body of Asia -- the pre-war boundary that we see, the oft-quoted 38th Parallel, was just a line on a map. There was no distinctive geographical feature that broke that out, there was no natural defensive position, no canyon, no river, nothing like that. It was simply a line drawn on a map to separate advancing Soviet forces in 1945 coming down after a very successful campaign in Manchuria and then the Allied Occupation Forces coming from the south. So this was basically the line that was set upon and this was a line that was very contentious in the 1940s with incursions of the North down into this region, some interest in the South in seizing areas in this region.

Basically if you look at it in geographical terms, this is the industrial hot land up here. This is the agrarian belt, if you will, down here. It's funny for us to say that when we think so much of what we buy today is manufactured in Korea but basically in those days this was farm, this was industrial -- a little bit like the American Civil War although this wasn't Cavaliers versus hard-nosed Yankees.

Now if we take a look at the stages of the conflict, it basically goes through four stages. We have the North Korean invasion that forces us down to the bottom of the peninsula. We have then Douglas MacArthur's brilliant invasion of Inchon which then drives the line back up to the North. We have the intervention in November 1950 by Chinese forces, and we have stabilization and stalemate then that followed basically as we push back up to roughly the 38th Parallel from that point on.

If we take a look at this in detail, we have very rapidly the obviation of air power based in country, and since Korea was really the last great non-air refueled air war, there were

some limited uses of air refueling in the war, very limited indeed. Since it was really an air war where air refueling did not figure, basically removal of those bases in Korea caused very serious challenges for us in terms of responding to the North Korean threat. They found the best way to do it was simply to seize the airfields and they did – they overran them very, very rapidly.

Having said that, we were blessed by a couple of things. We had sufficiently powerful air power forces based within Japan and based on carriers off shore that we were able very quickly to bring air attack onto those advancing forces. While we were not able to halt them, there was no halt faze strategy here, if you will, per se, as we talked about in the 1990s, nevertheless there was so much attrition of those forces as they came south that eventually they got to the point that they simply were not able to close that pocket region. The offensive petered out around the Nantong River, and so you have the invasion in late June 1950, June 25, by mid-August 1950, you have a full blown battle taking place down around the so-called Pusan perimeter down here, along the Nantong River and they're not able to crack that. In this battle, and I'll talk about this, battlefield air interdiction strikes, close air support strikes, were absolutely crucial to cracking the ability of the North Koreans to project their forces and to close that gap. Air, in other words, for the first time in 1950, air saved us from being pushed completely off the Korean peninsula. I'll talk a little bit more about that.

With the North Korean offensive in the position of a boxer who has thrown a punch and left himself open and expended all his energy, Douglas MacArthur then launched against the North Koreans a brilliant master stroke and that was the invasion of Inchon. It was an invasion that was made possible in many ways because of a great deal of reconnaissance activity so that we understood where to land, we understood what the title situations would be, we understood what we could get away with, and I'll talk a little bit about that later. Basically the Inchon invasion, coming in here, at this point, immediately, naturally caused a relaxation of North Korean pressure around the Pusan perimeter. The Army which had been steadily receiving supplies and building up here was able then to undertake its own break out, and you had a head-long, rapid collapse of North Korean forces back up to this line here, which was reached in mid-November 1950. It was a remarkable collapse.

I've often wondered that the traditional view that many historians take is once we crossed the 38th Parallel, we were getting in trouble. We should we have simply gone back there and said, "See, we restored the country. Thank you very much. Now stay out of our face." I don't think so. I think actually what we did was probably right, but the problem then that MacArthur and his forces ran into was they were making such great headlong progress, they were forgetting the logistical tail they would require to support them. They were also forgetting the winter was coming and they were forgetting, above all, the intent of this big, unknown quantity up here, called China. Had they actually been willing to settle for a line maybe Wonsan over to Pyongyang, in this area here, we probably could have sealed the country off at that point, stabilized our own situation to the point that we could withstand any assault, and then engaged into some sort of talks, and probably wound up with a Korea today where the northern border of South Korea would be

somewhere up here, as opposed to along this line here. That's my own personal thought; I have no proof that that could have actually been accomplished.

In November 1950 the other shoe dropped, and the other shoe, of course, was the Chinese counterattack that was very powerful, very robust and overwhelmed Allied forces very, very quickly. It led to basically a headlong collapse in the West, in this portion, and it led to a more structured withdrawal here, typified by the withdrawal from the reservoirs down to the port of Hungnam. In both cases, you had a sea evacuation which took off large numbers of forces and also friendly Korean forces and as many refugees as we could haul as well, and brought them down to the South. But this robust advance here, basically, obviated all of the advances that we had achieved under the MacArthur strategy, pushed us back across the 38th Parallel, pushed us back below Seoul, down to this line here, which was reached in January of 1951. This was the nadir, if you will, of our fortunes following the Inchon success, and it was caused really by the one big thing that I pointed out here, and that was the complete under-estimation and over-confidence that China would not involve itself in the war.

Once again, the second time in 1950, air plays the absolute critical role in ensuring that we once again are not thrown off the Korean peninsula. It steadily attrited the North Korean forces as they were coming down and I'll, once again, mention that a little bit later when I get into roles and missions and use of military power.

That set the stage really for a stabilization of the front because what happened after that point was, in the face of intense resistance, we fought our way back up to the 38th Parallel and then to what was a more defensible position defined by ridge lines and so actually from this point on, the war becomes World War I in many ways. It's not the World War I of the Western Front, the flat terrain and trenches and things like that. It's a war more akin to, if you will, the war in Italy or the Balkans in the First World War, where you have a largely static front and hilly terrain, mountainous terrain, where the power of observation and understanding where your opponent is and what strengths he has plays very well to your success. It's also a very intensive war in terms of artillery and, from our side, in terms of air power. At that point, the North Koreans realized, I think, that really whether they wanted to or not, they're going to have to come to some sort of understanding and so we have the beginnings of talks which, of course, we associate with Pan Mun Jon and, of course, still go on, and we have, as I point out, this, if you will, line which becomes an armistice line which is affectively rotated about this point here, from this flat 38th Parallel to a skewed angle there, and then from that point on, once the war ends in 1953, we have, of course, the long watch of Korea that continues to the present day.

Now let's take a look at some mission areas. If we take a look at the uses of air power, of course, air power is used in a variety of roles. The first and most significant of those roles really is air superiority. If we had not controlled the air in Korea, we would have been booted out of Korea, no question about it. The Korean air superiority war was a much more challenging and much more complex war than we think. It was exacerbated by the distances that we had to fly. It was also exacerbated by the nature of the technology we

had to use. The early jet aircraft were fuel hogs. This is in the pre-air refueling era as well. We're in a very hostile environment and then we also have to undertake it within the context of a so-called limited war. This wasn't like World War II.

So, here's the environment, basically, if we take a look at the Korean peninsula. As things work out, the air war is fought primarily in this area here. Once the Korean War settled down in the late 1950 time period, the air superiority war was fought largely here. Occasionally you would have MiG forays out to Wonsan in this direction. Very rarely you would have MiG forays south into this area here, but those were extremely rare. Those were almost like "showing the flag" type flights. Much more typical around here later on toward the end of the Korean War time period was "heckler activity" where you would have light biplanes with bombs flown over some of our airfields to disrupt things and sow confusion and attack aircraft and things like that and I'll talk a little bit about that. But basically North Korea started the war with a number of operational airfields. South Korea basically had almost like a constabulary air force. It had no more than about 20 combat aircraft worthy of the name. And so when the war gets going, and our air fields in the south get run over, we find that we have to supply air power from Japan, from Okinawa, from other places and then once, of course, we get in, we are able to push the North Koreans further to the north, we're able to reestablish airfields, and then once the war stabilizes we, of course, have air operations then out of some classic bases here, K-14, K-13, you know, the classic Korean bases that have come down in the Korean War.

If we take a look at North Korean bases, this is from 1951, but this could have just as easily have been from a chart from the 1950 time period. We see there's a very robust number of fields here. There's a great deal of redundancy here and so when you're dealing with the bomber force that we have in the pre-precision weapon era, keeping these airfields closed is a challenge. This is not a matter of putting a few GBU-27s on hardened aircraft shelters or something like that. There's a lot of re-visit requirements here and those re-visit requirements by aircraft like the B-26 or like B-29s which are having to operate in very intensive anti-aircraft environments and the expectation of aircraft loss rates is very, very high.

What did we have in terms of combat aircraft capabilities to confront the North Koreans at this time? The finest Air Force fighters at the beginning of the war basically were these three types: the P-51 – the F-51 in Korean days, was, of course, a legacy fighter from World War II. A very fine airplane. If we think about it, in 1950, it's only been in operational service for six years with the United States Air Force, if we take a look at the F-51D. So it's a very robust airplane and it's a very powerful aircraft and it's being paired off with aircraft that are much like it, the YAK-9 family, the YAK-3 family, things like that.

Because we were concerned about night air defense and all other air defense, we had a very interesting machine called the F-82 Twin Mustang, which is also in the collections of the museum here, which had this huge, rather odd-ball radar stuck under the center

section of the airplane, but which was itself a very powerful aircraft and had basically the same performance attributes of the F-51.

We also had in theatre the F-80 Shooting Star. Now the F-80 Shooting Star was the first combat-worthy American jet airplane. It was not up to the latest state of the art of fighter technology. It was not a swept-wing fighter; it was not a trans-sonic fighter in the way that we think of an F-86 or even a MiG-15. But nevertheless, these sufficed to take on the North Korean Air Force.

The Navy, which at this time tended to operate, it was not yet in the swept-wing era because it still had to concern itself with operating off the straight deck carriers which forced constraints upon the aircraft performance. The Navy operated another World War II legacy airplane, a very fine one, the F4U Corsair, which was the Navy equivalent, if you will, of the P-47 Thunderbolt, an excellent ground attack aircraft and an excellent air-to-air fighter, and the Grumman F9F Panther. Now the Panther was a straight-wing jet airplane. It was powered by an American engine called the J-48, which was a derivation of a British engine, the Rolls Royce Nene, which had also been sold to the Russians by the British Labour government. So the Panther when it was flying in Korea was fighting MiG-15s that also flew with basically Rolls Royce Nene engines. One of those few conflicts where you have two aircraft opposing each other that have a lot in common. But the Panther, you'll notice, was a straight-wing airplane. It did have one thing that was very significant – it had an excellent gun system. It had 420mm cannon, which guaranteed it a very high probability of kill if it hit an enemy airplane. So in the case of the North Korean Air Force, it was largely a case of “now you see it, now you don't.”

The gun camera film footage on the left was taken by William Hudson's F-82, the first victory that we scored in Korea. There it is going sayonara, out to the left. There is another one that was shot down during the same sortie on the ground at Kimpo on the right. And that basically sort of set the stage for what happened with the North Korean Air Force. The North Korean Air Force was taken out of the fight very, very quickly. There were sporadic encounters from that point on, but until the Russians got into the act in November 1950, Communist airpower was not something we had to worry about. The guys on the ground, with all the problems they faced from masses of T-34 tanks and a lot of infantry armed with burp guns and stuff like that, nevertheless, the one thing they really didn't have to worry about on top of that was being attacked to any great degree by somebody flying a Sturmovik or a Yak or something else over their head.

Now the other shoe dropped in 1950 in terms of the air superiority war when we had the involvement of the Chinese into the conflict because that also coincided with Joe Stalin sending the Soviet air force into action against allied forces in Korea. The war widened tremendously and it became a very, very complex war, the reason being that this was the line, the border, between North Korea and Manchuria, the Yalu River. So this basically established a sanctuary, and so on this side of the line you had a number of airfields and airfield complexes particularly in the Antung area down here and then up in Mukden, which was an old area of the Japanese aircraft industry in the late 1930s and World War II era. And basically these became sources then for MiG operations in MiG Alley, and

when we would approach, basically, they'd pick and choose the moment of engagement and then scoot back across the Yalu before we could get up against them.

This was a real concern for our bomber people who were trying to cut supply lines, particularly cut bridges along which supplies were flowing from Manchuria into North Korea. That resulted in December 1950, in the United States Air Force sending the F-86 Sabre into Korea. The F-86 Sabre was a remarkable airplane so it's very interesting, I think, to take a look at the relative performance merits of the F-86 and the MiG-15. They are not, as some writers have alleged, similar airplanes. There are a lot of differences between these two aircraft. The MiG-15 had a centrifugal flow engine which gave it a fatter body, a larger diameter. It also did give it though a little better acceleration. In the early days of centrifugal flow engines they tended to give you a little higher acceleration. It was a mid-wing airplane, wings located at mid-fuselage – the F-86 was a low wing airplane. It has a fixed horizontal stabilizer and a movable elevator perched high on the fin. The F-86 has a low placed horizontal stabilizer. In the A model, the horizontal stabilizer was fixed and the elevator was movable, but the later F-86, and this was very important, had an adjustable horizontal stabilizer. That adjustable horizontal stabilizer affectively acted as an all-moving tail, and because of that, it's very interesting to take a look at kill ratios between the MiG and the Sabre. They go up dramatically after the introduction of the adjustable horizontal tail because what that gave you, pulling lead on a MiG at .8 Mach number and above, the F-86 had a greater ability to command pitch authority over that MiG than the MiG had.

Now both had interesting gun systems that weren't necessarily the best. The MiG was designed to do one thing and that was to shoot down atomic armed B-29s, and it could shoot down the B-29s very, very effectively. It had a large 37mm cannon, and two 23mm cannon, different ballistic arcs for the bullets, so of course, that was a bit of a problem. The Sabre, on the other hand, was a kind of all-purpose fighter and it had the standard package we had had in World War II, which was six .50-caliber machine guns. The .50-caliber was a very fine, very hard hitting weapon, but at the same time, you needed a lot of dwell time on the target really to kill it. Had the Sabre had four 20mm cannon, I think you would have seen Sabre kills over the MiGs go through the roof. And that was one of the reasons, if you take a look at the F-86H model Sabre that came after the Fs, the F-86H had the four 20s in it. But the Sabre with a radar range and gun site up front, superb visibility from that canopy; that was just a joy to behold. The Sabre actually was a very fine airplane. It's been fashionable in some revisionist circles to knock the Sabre – oh, it's heavy and all this and that – but the Sabre did a very, very fine job.

The MiG threat to the B-29, both the daylight threat to the B-29 and the threat at night, was quite profound. If we take a look at that problem, B-29 losses went very, very high. Fourteen percent of the B-29 force that flew in Korea wound up killed, captured or wounded. So that tells you that was a pretty costly operation.

Everyday we don't think of Korea much as a strategic bombing war because there wasn't that much industry or that much seeming industry in North Korea but every single day you had on average 20 B-29 strategic bomber sorties over the North. Most of those after

the initial days of the war, which had gone after ammunition sites, barracks, port facilities, things like that, most of those were going after interdiction targets – they were going after bridges, they were going after depots – but at the same time, that put them in risk of being attacked by MiGs.

The photo that you see here was taken from a B-29, a very famous one called “Command Decision,” and that shows three MiGs making passes on the formation that it was in.

How did we counter it? Well, we countered it with a lot of fighter escort. One airplane that proved surprisingly useful because it had very good, long legs to do this was the F-84. The F-84 is one of the major workhorses of Korea. I’ll talk about it a little more in terms of the air-to-ground war because it’s a major fighter-bomber. It was, once again, kind of belittled for being relatively powerless and requiring a rather long take off roll and things like this, but the F-84 air-to-air did very, very well when called upon to do so as an escort fighter against the MiG.

The nighttime operations were more complex. We set up barrier patrols along the Yalu River to catch the MiGs as they came across the Yalu River. The MiGs that were coming across were Russian MiGs. They were flown by Russian pilots. They were queued by Russian-controlled, ground-controlled interception based at Antung. We know this because of so-called wise service intercepts from a signals intelligence operation we had going at Chodo Island. What they would try to do was set out a formation of three MiGs. They would vector out the MiGs behind a strike flight of allied aircraft or a bomber stream and then they would try to beacon them to come in from the 6:00 position on that bomber stream or strike flight, whatever it was. And it was typical Soviet sort of GCI control. We weren’t able to break the GCI links, but knowing that, we knew what to look for and we knew where to place our own fighters.

The barrier patrols were conducted primarily by this aircraft here. It was an airplane called the Douglas Skyknight. It was flown largely by the Marines although a small Navy detachment flew late in the war, VMF-513. It was an aircraft that had relatively undistinguished performance. It’s about a 420 to 475 mph airplane on a good day, but it has four 20mm cannon, and it has very large radar in the nose. But to give you some idea of how large the radar was, the tail warning radar this airplane had was the same radar that the night-fighting Corsair used as its primary radar, and it had a radar systems operator, usually a petty officer in the Navy or a gunny in the Marine Corps flying in the right seat. They were very successful in their operations on these barrier patrols in either fighting off the MiGs or shooting them down.

We operated in the Air Force the F-94 which was a variation of the Lockheed P-80 via the T-33. It was basically a T-33 with an afterburning engine. The radar operator sat in the back end and the radar in the nose and then four .50-caliber machine guns. There were later variations of this that carried air-to-air rockets but they were not used in Korea.

The F-94 had a very complex but extremely effect fire control radar, the Hughes fire control radar, but like most technology, it was considered so valuable we didn’t want to

risk it over the North. So for a very long time we held the F-94 back below the 38th Parallel. Only toward the end of the war did we let it go up North and it did quite well when it did that.

Now the outcome of all of this, the air-to-air war with the Sabre guys going after the MiGs, the night-time war with everybody else, basically the MiG was removed as a threat from Korean skies. Here's two ... the one at the top is being shot down by a Navy Panther guy; the one at the bottom is being shot down by a Sabre. (I'm trying to be very "joint" in this presentation.) Here's the Korean aces that are shown here. Now this shows 39. There were actually 40. There was a guy who was credited after this was put together. He was credited with a fifth kill.

Basically these were the guys that scored five or more MiG kills. Now at the time during the war, we had this figure, 14 to 1 victory-loss ratio, the F-86 versus the MiG-15. Then later on we had 10 to 1. And then later on, you had the cynics say, "Nah, it was probably like 6 to 1." Then you had the Russians who said, "No, it was 10 to 1 in the other direction." I kid you not, but you know, what's the truth? The truth depends on the time. You know, if you take a look, you had some individuals that were referred to as "honchos" that were very, very fine pilots. They were some of the leading World War II fighter pilots that the Soviets had fielded, people like Ivan Kotzebue, people like that, who were quite good and would have been quite good in any air force. So that on average, it's probably around 8 to 9 to 1 or something like that. When you had "newbies" show up, the kill ratio tended to go very much in our favor, probably as high as 14 to 1 on occasion. When you had extremely experienced people, it probably dropped down in that region of maybe 6 to 1, something like that, but on average, I'd say 8 to 9 to 1.

There was another aspect of the air superiority war that I'll throw out there because it's one that caused continuing concern, certainly at least through the 1980s, and that was the idea of night hecklers and special operations type aircraft. The North Koreans acquired a number of trainer aircraft, some of these from residual aircraft left over by the Japanese after they left the country, and then others, the ubiquitous Russian PO-2, light Pala Kopf trainers sort of like a Stearman, and they would typically put a guy in the back end, and he had a machine gun and a bunch of stick grenades and the pilot would fly over Akimbo or something and he'd throw out the stick grenades and try to shoot something up. These were very difficult to defeat. We sent up night-fighters against them, F-94s. We even had a mid-air collision with an F-94 and one of these guys. We found that jets didn't work real well.

The aircraft that seemed to work the best was the Corsair. If you took a night-fighting Corsair with its radar, and the guy got up and he got dirty – flaps down, gear down, hook down – he could basically hang in there and weave with one of these guys and nail him. And Guy Border Lon, a Navy pilot, actually shot down five of them.

One of the more interesting photos is this one here because this shows one of these hecklers after it was shot down over Akimbo, but this is an ex-Japanese Army Air Forces

airplane. This is a Tachikawa, KI-9 I think the technical designation is. It shows they really did fly with everything they had.

Okay. That's the air superiority side.

Let's take a look now at close air support and battlefield air support. I mentioned this was a war and a scramble. At the very get-go of the conflict, the biggest problem we had was we were facing a rolling, unfolding mechanized advance that was very powerful. The United States Army was being pushed off the Korean peninsula by an army that hadn't even existed in 1945, interestingly enough. And the weapon that was really spearheading this was the Soviet built T-34 tank, one of the finest tanks of all time, a very, very fine tank.

So how did we respond to this? Well, we needed on-call air power, and the on-call air power was furnished largely by the Navy because the Navy had an aircraft that had extremely long endurance, and another aircraft that had pretty good endurance. The first aircraft was the Douglas Skyraider, which of course became the Sandy, the A-1 in our service in Vietnam, and then the other aircraft that had slightly less capability but was pretty good, was, of course, the Corsair.

We also made some technical modifications to these. Here's a Skyraider being bombed up. You see the relatively non-aerodynamic shape of the bomb but then the thing that's interesting is to take a look at these rockets. It's carrying 12 five-inch rockets, but these do not look like your typical five-inch rockets. It's because these have a shaped charge warhead, these are so-called ATAR's, anti-tank aerial rockets. They were developed at China Lake and they were extremely accurate and they were extremely effective against North Korean armor.

The Air Force with the P-80s ... the P-80 was a work horse in the war and performed nobly in any number of roles – reconnaissance, air-to-air, air-to-ground. The P-80s in the early days were operating from Japan and they were very limited in the amount of time they could actually spend over the target. Operating from Japan, they would get to a target and they would need clearance to hit a target within maybe two to three minutes before they'd have to turn around and head back to home plate. So it was a real scramble.

That brings up one of the real problems we had with battlefield air support in the early days of the Korean War and that was tactical air control. We found that Korea was a tremendous war for learning and re-learning the lessons of World War II. People had learned then, in the Western Desert, carried into the invasion of Italy, carried then into the invasion of France in 1944 and all through the break-out, on coordination between air-land forces, co-locating air and ground headquarters, and inner ground communication so that everybody could come upon the net and nobody would jam somebody else off.

Well, what we did very quickly was rely on airborne controllers. We took the venerable T-6, a tremendous aircraft, put an observer in the back end and equipped the guy with a bunch of radios and then we did something that had been done in 12th Army group in

World War II and that is we took Air Force guys, put them in Jeeps, equipped them with radios to undertake tactical air control liaison from the front. It worked pretty well, but there were a number of disconnects over the fall of 1950 before we got things to work smoothly. The complexity of it can kind of be seen in this where it kind of shows the relationships you have between tactical air control parties on the ground, air controllers aloft, strike aircraft coordinators, and then strike forces coming in and then the ground forces that they're working with on the ground. Response times, early on, tended to be 45 minutes to an hour. That was unsatisfactory. We eventually got that down to about, by the end of 1950, we were getting that down to the 15 to 20 minute time, sometimes even shorter if we had rotating, on call orbiting strike flights operating directly overhead.

Now, having said that, what's very, very interesting is that the position the commanders had was that battlefield air control was working pretty well, with the exception of one guy. Unfortunately, the one guy happened to be Chief of Staff to the theater commander (who was Douglas MacArthur), Chief of Staff Edward Almond. And Almond went back to the United States and said this isn't working at all. And I know, because I graduated from the Air Corps Tactical School back in the 1930s as an infantry guy and the Air Force guys don't care about me, and they want to keep all their airplanes to themselves, and they're not giving us the kind of support we need. And that became like the McChrystal business of today. It became the big headlines in the American newspapers. Oh my God, we're losing the war because the Air Force isn't willing to stick its neck out and help the little guy on the ground. Well, you know, it was absolutely rubbish as we'll see from a couple of quotes here from Army people very, very shortly. But that became kind of a type-cast model that drove a lot of other thinking.

Having said that, once we absorbed that North Korean blow, once we went back up North into the Yalu, once we got pushed back by the Chinese where the same kind of air control procedures once again worked very, very well for us, we had some other interesting examples of what would be called interdiction strikes, or battlefield air support strikes, but not the kind of things you would classically recognize. One of the most interesting one is in May 1951 and it's the so-called Hwachon Dam strike.

As we were moving back up to the 38th Parallel, the Communist were impounding waters behind the Hwachon Dam in hopes of releasing them to literally wash away the advancing UN forces as we came up below the dam. This would have wiped out a lot of lines of communication and stuff like this. It probably wouldn't have killed anybody but it would have certainly been a logistical inconvenience. How to get rid of this? We couldn't very well take down the dam. That would have achieved their desired affects, but we could try to achieve a programmed release of those waters.

Now how to do that? Well the Navy had just the weapon. It was called the torpedo. We had Douglas Skyraider ADs operating off, I believe it was the Carrier Boxer – I may be wrong on that – may be the Valley Forge, and they were operating torpedo laden ADs and they came over the impounded waters of Hwachon Dam and you can actually see the streaks from the torpedo wakes in the water, and blew away the locks. Of course, you've

got the programmed release. See the water gushing down already from some of these and the water vented to the point where they couldn't do anything about it.

We were very concerned about trying to intimidate psychologically the North Korean forces to crack this resistance to us and just like we did in the Gulf War, we had the introduction of propaganda leaflets, you know, "stay away from your unit, stay away from this, stay away from that." This was one that called on the power of the so-called Flying Tiger, a very powerful mythic symbol. You know, basically saying "don't fight us, come to us and give up or otherwise you will face some sort of grizzly and horrible death." By and large, it seems to have worked fairly well. The common currency when we interrogated POWs in Korea, much like, by the way, in Iraq if you take a look at the battlefield interrogation reports of POWs after the Iraq War, was "Why did you surrender?" Because of fear of air attack; I was dislocated and I was afraid; it was aimed at me personally; I thought I would die; that sort of thing. It was very, very interesting.

The bottom line here being if you take a look at the command position from people who really are in the know, you see that there's really none of this Edward Almond type stuff about air power is not working. Douglas MacArthur, you know, not a fellow to give compliments generously, was, I think, quite enthusiastic here by his standards and certainly if you take a look at Walton Walker, who unfortunately died in a Jeep accident on the road in 1951, that statement, I think, speaks largely for itself. If it had not been for the air support we received from the 5th Air Force – he could have added the U.S. Navy and Marine Corps – we would not have been able to stay in Korea.

Now if we move on then to the interdiction war, the interdiction war was a more complex war in many ways. The close air support war was an in extremis air war – people literally coming over the ridge, coming right at you. The debate in the close air support war was which model worked – the Air Force model or the U.S. Marine Corps model? The U.S. Marine Corps model was based on delivering fire directly in front of the troops. The Air Force model, which followed standard Army-Air Force relationships, FM 31-35 said "Air support operates from the artillery line up to the bomb line." What people missed in this close air support debate was if you took a look at the overlay of Marine close air support and Air Force-Army close air support doctrine, it covered the entire battle space, which is exactly what you would want it to do.

The interdiction war was one that there was a much more sharp delineation of responsibility between the operable parties. We had basically the Navy assume responsibility for interdiction over this portion of Korea, including this little in-shoot here on Yangdong on the rail line, operating from carriers in Task Force 77 which was normally based right about here. We had the Air Force take this area here. Then you had strategic bombers which operated over this entire area as they were tasked to meet whatever precise requirement they were required to meet.

Korea was not a very well developed country with the kind of infrastructure that if you destroyed it, it would inflict a permanent sense of denial upon the North Korean forces. Therefore, interdiction became extremely problematical from the get-go.

I show two aircraft that were used in that role. One of them is the ubiquitous Douglas B-26, the A-26 in World War II, a tremendously versatile airplane used for a variety of roles in Korea. The other is the F-2H Banshee which was a twin-engine Navy and Marine Corps jet fighter, two small jet engines, J-34 engines, one in each wing root, but a very, very effective airplane in its own right. This is the airplane that is in James Michener's novel, *The Bridges at Toko-ri*, although in the movie they used the Grumman F-9F.

Road and rail strikes. These two photos kind of show the problem with road and rail strikes. We have here a Panther F-9. You can see the dive brakes out on it and it's going out, taken on this road where you can see there's a crater from a previous hit here, but you realize if I blow away this road, it's probably not going to inconvenience people too much. And then you take a look at this rail strike over here, moving this rail bed, same sort of thing. You know, there's the crater of the bomb, the rail line clearly is disrupted but how long is that going to be taken away from you?

So actually if you take a look at the interdiction war, we had a term for it. The operation was called Operation Strangle. Operation Strangle echoed an operation of the very same name that we ran in Italy in 1944. Ironically, there's a lot of similarity between the two. Both sought to inflict supply denial upon the enemy. In both cases, in the Italian campaign at that time and in the Korean campaign over most of the time, we were fighting largely a war of stalemate with very little heavy fighting at the front but a lot of steady engagement at the front. So the usage and wastage of material and supplies was not high enough where the results that we were getting from our attacks would begin to have an impact on the foe.

Now in the case of Italy in the Second World War, the German forces in Italy in '44 and the case of the North Koreans in Korea in 1952-53, when they went to a higher level of conflict, when you started to have an increase in artillery duels in the front, when you start to have an increase in usage of personal weapons in the front, then that supply denial did start to make itself fit. We probably took away between 80 and 90 percent. There was a Navy technical intelligence study that did an analysis at the end of 1952 that concluded that we probably had taken away from them 80-90 percent of the supplies that were heading down the main lines of communication and toward the front. But the remaining 10 percent that got through was sufficient for them to continue the war. The main value of strangling Korea, just like the main value of strangle in Italy in the 1944 time period, was that what it really did was it fixed the enemy forces in place when the actual enemy fielded forces tried to maneuver, air attack was there to hammer them and so it forced them in many ways to go to ground and it reinforced this notion of them having to dig in along the front.

We had some strikes that were more productive and those were the bridge strikes. B-29s undertook a number of strikes on the bridges across the Yalu. Now some of these were a day late and a dollar short in terms of the very onset of the Chinese intervention in November 1950, but the strikes from that point on, on closing the bridges, were actually very effective on preventing follow-on supplies from coming through. Most of these were

dumb bomb strikes and it was very, very challenging for how the B-29s had to strike because they obviously had to avoid then entering Chinese territory and violating the Chinese sovereignty.

We did experiment, in fact more than experiment, with early precision guided munitions, the so-called Razon, an early form of precision munitions. While it has been popular to say the Razon was a failure, it is very interesting when you actually take a look at the hits, you find that as the crews got skilled in using it, the hit rates went up to 68 percent. Sixty-eight percent of Razon hits compares extremely favorably with the first usage of laser guided bombs in Vietnam in the early 1970s. And indeed, at one period, they were getting over 90 percent hits which would be very good even by the standards of Operation Desert Storm, for example. So the Razon here ... once again Korea drove many things, and I'll talk about this, not the least of which was the desire for more precision strikes because bridges, as they did in Vietnam later, became huge flak traps.

We undertook an air interdiction campaign called Air Pressure in which we tried to look at other ways to get at the North Korean regime and Chinese Communist forces. One of them was by more attacks on infrastructure, warehouses, power generation, things like this. This is the Sui-ho Dam which was struck in the summer of 1952 and the aircraft that prosecuted these attacks were, as I pointed out earlier, very early on, the F-80. As the F-80 started to get a little bit long in the tooth for this kind of operation, we saw its role taken over by the F-84, which was a tremendously good fighter bomber for its time. Then toward the end of the war, even the Sabre got into the act. If you take a look at the introduction of the F-86F, when the F model Sabre gets into Korea, it's used increasingly as a fighter bomber. Bud Mahurin, some of you may realize that Bud Mahurin, a very famous fighter pilot from the Second World War, Korean pilot was shot down as a ground attack guy in an F-84F. One of the things we were concerned about, we were always getting targeted with this notion that we were dropping biological weapons and we were trying to destroy the Korean people, etc., etc. It's interesting to note then, as now, we went to a great deal of trouble and difficulty to drop notices to warn people to simply stay away from unexploded ordinance. Then, as now.

The airlift war was one that was absolutely crucial in terms of supporting what was going on in Korea. Without airlift, if nothing else, people would not have had R&R which is a tremendous morale booster for them. If you take a look at airlift, airlift brought a tremendous amount of supplies forward to units when we were on the move. It's funny to be talking about an Air Force war in which the C-130 didn't play a role but no, it didn't play a role. This is well before the era of the C-130, but this is the experience that encouraged people to make the C-130.

It was a legacy air war. It was a legacy air war with aircraft that we had first seen employed in the Second World War. We had the C-17 of its day, if you will, which was the C-46, a relatively heavy lift aircraft; the DC-3, C-47 of course, which went back to the 1930s in terms of aircraft technology; the C-119 which was a mainstay of airborne operations and did some very good work as we were advancing north to the Yalu and then later on as we were pushing north back to the 38th Parallel following the Chinese

incursion and recovery; and then, “Old Shaky,” the C-124 which was like the C-5 of its time. Many of you will probably remember this droning around of seemingly impossibly slow speeds on its way to deliver things, but the C-124 was a critical player in casualty evacuation and also in supporting us with what passed in those days of the pre-turbofan era for heavy lift, recce, special operations, search and rescue, you know, critical operations.

The thing that’s interesting about all of these is in peace time, you never seem to be able to get enough support for them; in wartime, you never get enough. This is sort of the unsung part of it. Recce was an interesting story. We had, of course, some sophisticated airborne intelligence collection using electronic platforms like EB-50s, EB-29s. We had strategic intelligence with B-29s and B-50s. The Navy had the same with Merkatons and Privateers, PB-4Y2s. When we take a look at all that, that came at a risk. Some of those aircraft were indeed shot down, crews were lost. We mustn’t forget that.

Much more common, much more typical was tactical reconnaissance and some special deep reconnaissance that was flown using basically modified medium bombers and early jet fighters. The B-45, which was a four-engine early jet bomber for the United States did not really prove to be a great success as a reconnaissance aircraft in Korea. The reason being it was not invulnerable to interception. We had three in theater. One was shot down by a MiG-15 and lost over the North. That, by the way, was the first shoot down of a jet bomber by a jet fighter in aviation history. Alas, it was on their side. Much more typical were modified tactical fighters like the F-80. Here is a recce F-80. And later on, the recce F-86. Not many people knew about this. It was not very well publicized at the time but we took a small number of F-86s and we modified them as high speed reconnaissance aircraft and operated them very effectively into China and into Russia to get strategic intelligence information. The experience we have here leads directly to RB-57, leads directly to U-2, leads directly to what we experienced later in the Cold War with the A-12 and the SR-71 program.

Combat search and rescue ... Korea was in some respects kind of a nice anomaly. We had so much air control over so much of the country that we were able to prosecute combat search and rescue relatively deep into Korea and relatively frequently and get a surprising number of people out. If you could make it offshore, we had amphibian SA-16 Albatross aircraft. We had helicopters everywhere, of course, and the mainstay of that was, of course, the H-19, a very, very powerful – really, to my mind, the first practical, useful military helicopter, one that was more than just an occasional use, one that was a very robust system. This too pointed to the fact that we would need to get the helicopter into the gas turbine revolution, the kind of thing we experienced later with vehicles like the Huey and then the H-3, HH-53 and, of course, the predecessors of everything we know today when we think of MH-53s and some of the special ops we have today.

Special ops included some other things. We did a lot of agent drops. Air Force crews manned high speed small boats and ran them up the rivers into Korea. These guys really were quite impressive human beings, inserting agents. Basically what we were trying to do was also to find MiG wreckage. Everybody was really interested. What makes the

MiG tick? So there was this tremendous search for wreckage. Cornell Aeronautical Laboratory established a lab where they had bits and pieces of MiG carcasses all over the place. We ran some really intensive operations there, some in conjunction with the Brits. A frigate named the Black Swan played a leading role in pulling some stuff up. We actually towed a carcass under water to get this aircraft out.

That finally led to a thing called Operation Moolah. Can we bribe a pilot for \$100,000 to deliver a MiG? Here the chipper says, "Hey, you give us the MiG, we give you 100,000 bucks." Now, believe it or not, we actually did get a MiG. A guy named No Kim Suk, I believe his name was, delivered this MiG-15 to us at Kimpo at the end of the Korean War in 1953. He's now an American citizen and he's quite a neat human being. Anyway, the Sabres were forming up to take off and suddenly realized there's a guy dead ahead of us and he seems to want to land. Oh my God, it's a MiG! This guy lands downwind, taxis by them, sort of waves or something, then opens the airplane. Everybody freaks out and we have ourselves a MiG, and you now have it in the museum here. He claims he never knew about this reward offer and as a result, he got it anyway – he didn't turn the money down. I guess it was stimulus money, change you could believe in. *[laughing]*

Moving right along ... Finally as I said, when we took a look at the conflict by mid-1951, it was quite obvious that pending some tremendously dramatic change in people's fortunes, the outbreak of a war in Europe or something of this sort, you weren't going to necessarily see a cataclysmic turn around in the fortunes of the combatants in the Korean peninsula. As a result, we launched into this long period of truce talks which bore fruit in July 1953. We had the concluding of the armistice agreement and we had the release of our POWs starting in August 1953.

What may we say, then, looking at this in retrospect. What did we learn? What was discovered? I think we use this term "lessons learned." It's kind of funny and as an historian, what I think we really mean is "lessons lost and relearned at a price." We learned, basically, that the World War II lessons of using tactical air power were absolutely critical. You needed to have an Air Force that had a capability and a competency in expeditionary warfare, going to war on a scramble, very quickly, no notice, having the ability to carry with it the logistical support, weapon capabilities, and imbedded capabilities to deliver decisive force. It had to be able to communicate with the ground forces, had to be able to respond to their needs.

For their part, the ground forces needed to have realistic expectations of what air could accomplish. It couldn't be something that you simply called up routinely. They needed to realize that it wasn't to their value to have airplanes constantly in site, rotating over their heads all the time. You know, the airplane when it was out of sight didn't mean it wasn't helping them. It might be doing something much more valuable that would impact their lives three days from now by blowing away an enemy command post or a bridge or something else well away from them.

We learned, and this is important, I think, in the post war and missions debate of the 1940s, the tremendous complementary of joint service airpower. You know, you've had

these battles they've waged since in war colleges and I've been party to some of them, but basically when you took a look at what was happening out in the combat theater, you found among the operators in the field, there was a tremendous desire to make things work and to find go-arounds and cut-arounds and solutions that would work very, very effectively as well.

I think another major lesson that we tend not to trumpet as much as we should was that Korea in 1950 would have been lost to Communists had it not been for the prompt intervention of air power. Air power simply made the survival of that nation possible.

There were tremendous communication and doctrinal differences. I'll talk a little bit about that, and the other thing we learned was all forces needed reshaping for the future. So what did that really mean? Let's take a look at some technology outcomes. One of the major ones was the greater emphasis on precision attack. James Michener, the novelist, went out with the USS *Essex* and came back from the war and wrote his novel, *The Bridges at Toko-ri*, which is a tremendous book. Together with James Salter's book, *The Hunters*, and Salter was an F-86 pilot in Korea, they're the two best accounts, I think, of the Korean air war. But Michener's book was based on an actual event. It was called the Battle of Carlson's Canyon and it was the idea of bridges becoming flak magnets or aircraft magnets and flak traps and costing a tremendous number of aircraft. Well, we saw that replayed, if you think about it, in Southeast Asia, if you take a look at the Dong Ha bridge and Paul Doumer and things like that.

What Korea did teach was that we needed to invest in technologies that would give airplanes standoff capability against hardened targets or difficult targets. That took us down the road of rudimentary precision weapons, think early Walleye, something like that. But that eventually, the ultimate fruition of that was the laser guided bomb that we saw emerge in the mid-Vietnam era, and if we go radically forward, to the GPS-based bomb. We started to see the potentialities of GPS guidance applied to weapons, of course, in the 1980s and moving into the 1990s. Korea definitely accelerated the transition to jets in the military services. The prop circling for strike aircraft was certainly inappropriate except under very special counterinsurgency circumstances, and even then, somewhat questionable, but for high end, high tech war, it didn't have a role to play any longer.

Furthermore, there was a tremendous logistical price where you now had to support multiple forms of engines as well as multiple forms of aircraft and capabilities in the force. It accelerated the option of aerial refueling by everybody. You know, if you take a look aerial refueling had been used by the strategic bomber force in this time period, but after Korea, basically we recognized that all tactical air power forces had to have the ability to pass gas between aircraft in order to achieve the kind of longevity or duration in flight to get a job done. It was absolutely crucial. The one area where we didn't do that was in airlift and we recognized in the 1973 Arab-Israeli War, very quickly, when our allies turned their backs on us and we had to do very long-range missions because we couldn't get landing rights by various people. We realized very quickly we needed to take the airlift force and make the airlift force an air-refueled force as well.

Speaking of airlift, the legacy airlifters that we had performed very well but quite clearly when you looked at them, getting around in the DC-4 level of technology, the C-118 level of technology, the C-47 level of technology, we needed to move beyond that. And that accelerated the move toward gas turbine propulsion, either turbo propellers, like the C-130 and C-133, or getting then into the advanced turbojet propulsion, C-135, and then beyond that. That set the stage that pointed us toward fan developments and with other technological developments down stream took us into the era of the 141 and the C-5.

We had the reshaping of the aircraft carrier. The aircraft carrier, which is a visible symbol of American commitment in crisis and power projection, came into the Korean War basically unchanged from World War II. It was a straight deck carrier, wooden deck. You had a landing signal officer out in the backend waving paddles to guide the aircraft on the way in. You had a hydraulic catapult, and if you took a look at this, you were having aircraft come aboard that were coming aboard sometimes at 150 mph touch-down speeds, some of the early jets. You had horrendous accidents. The combat activity of naval aviation reports, the so-called Cana Reports, indicate that every time a carrier air group left port, when they returned to port, they'd lost 10 percent of their air group through accidents. That's mind boggling to me. But then again, if you take a look at flight safety, every day during this time period, the United States Air Force was losing, on average, not from combat causes, but losing on average operational causes one or two fighter aircraft every single day during this time period. Those loss rates today, you know, you'd have multiple CNOs and Chiefs of Staff replaced.

The Navy after the Korean War completely reshaped the carrier. You got the angled deck, you got the newer landing system, the so-called Fresno landing system, you got steam catapults. The combination of those three which were embodied in the *Forrestal* of 1955, the first of the super-carriers that really sent us down the path toward naval aviation as we know it today.

Doctrinal and policy ... and this is the last slide. Korea did highlight very serious doctrinal disconnects on issues such as airpower employment and command and control, particularly over this issue of close air support. What came out of Korea was a heightened awareness of this and the Air Force undertook to prepare a whole series of Air Force manuals that were distributed on the employment of air power and the use of air power. It demonstrated, and I will stress this again and I stressed this earlier, the necessity of military forces, particularly those of the United States, have to have an expeditionary mindset and validated joint force air power. You know if you think about it, a superpower has to be able to intervene in a crisis region and, in fact, in multiple crisis regions perhaps simultaneously and win decisively in those crisis regions against opponents who only have to be concerned about what's happening in their own backyard. That's a very serious challenge. That's a challenge we continue to face today, particularly at a time of drawdown, aging force, stuff like this.

And finally, if nothing else, we can look to the Korean War, the first jet war and the first war that the United States Air Force fought after its creation. The Korean War certainly validated the creation of an independent United States Air Force.

I'm very happy to have been able to present this briefing to you tonight and I'll be very happy now to take any questions you have.