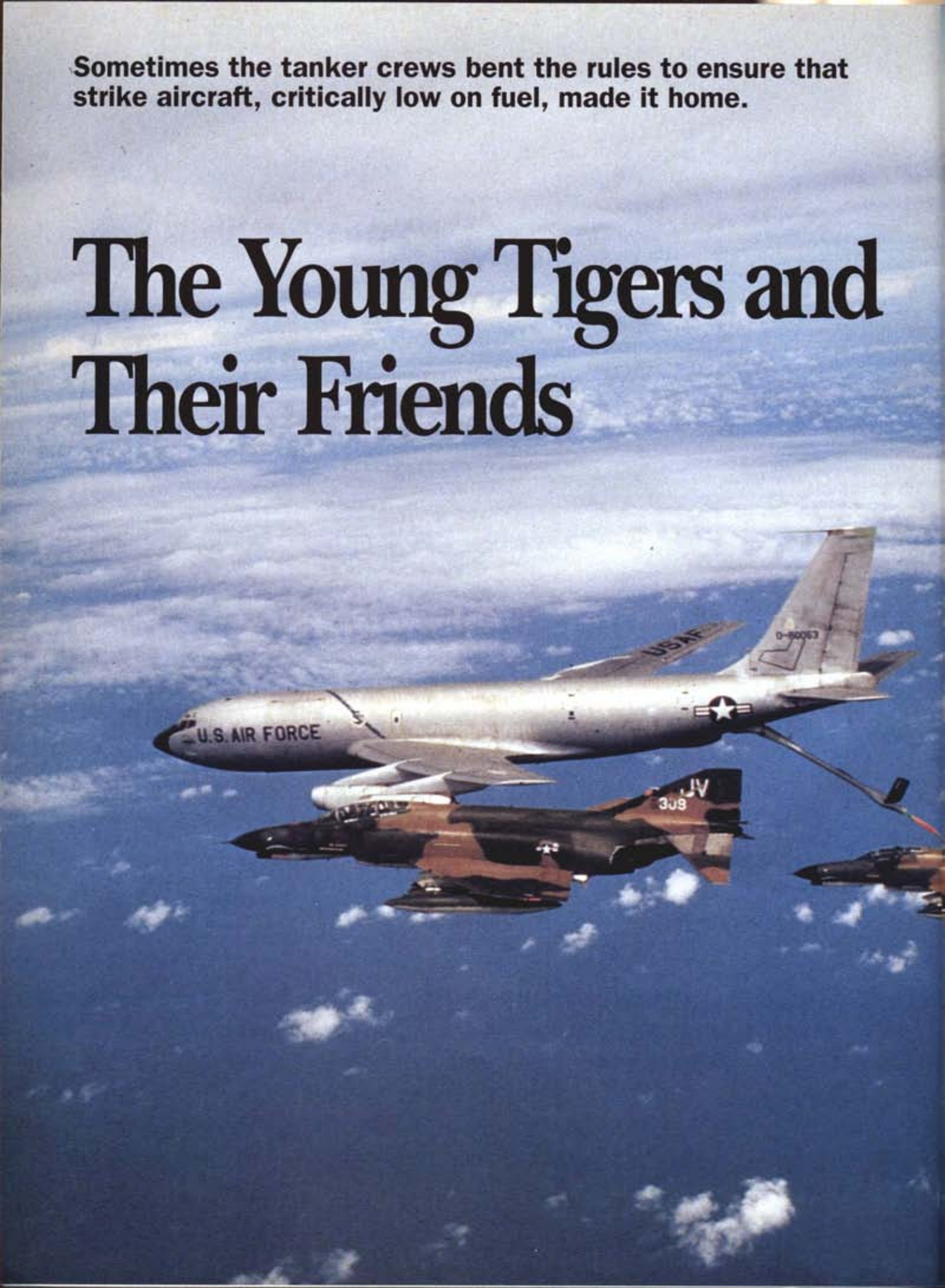
**Sometimes the tanker crews bent the rules to ensure that strike aircraft, critically low on fuel, made it home.**

# The Young Tigers and Their Friends



By Walter J. Boyne

The heartfelt phrase "Thanks, that's a save!" was heard more than 500 times during the Vietnam War as hardworking "Young Tiger" crews of KC-135 tankers moved into harm's way, delivering salvation to strike aircraft perilously low on fuel. Ironically, many of those saves were never officially recorded simply because they occurred when the tankers left their normal orbits to enter enemy airspace, in violation of standing instructions.

Any one of the saves was spectacular—particularly to the fighter pilot who was being saved—but what was possibly the most incredible save of the war illustrates the bravery, ingenuity, and persistence of the tanker crews in general.

There was some good fortune as well in the May 31, 1967, Young Tiger mission over the Gulf of Tonkin, when a KC-135 tanker commanded by Maj. John H. Casteel saved six Navy aircraft with a complex and totally unscheduled refueling. The KC-135's original mission was to refuel two F-104 Starfighters, using the drogue adapter that the probe-equipped F-104s required. Casteel's tanker refueled the two F-104s and was then told of an emergency involving two Navy KA-3 "Whale" tanker aircraft, which also used probes.

The first Whale hooked up, indicating that it had only three minutes' usable fuel. Its systems had malfunctioned, and it could not use fuel it had in its refueling tanks. After transferring 2,300 pounds, the KC-135 then refueled the second KA-3 just as it was notified that two Navy F-8 Crusaders were on scene and short of fuel.

One of the F-8 fighters had only 300 pounds remaining and immediately hooked up with the second Whale even as it was taking on fuel from the KC-135, initiating history's first trilevel refueling. As this was going on, the first KA-3 shared its slender fuel supply with the second Crusader. It then moved into position to refuel again from the KC-135.

So far Casteel and his crew had had a pretty productive day, refueling the F-104s, and saving two KA-3s and two F-8s.

However, the action was not yet complete. Two Navy F-4 Phantoms now arrived on scene, and neither had sufficient fuel to return to their carrier. Already low on fuel itself, the KC-135 turned south toward Da Nang, refueling the two F-4s en route.

When it landed, the KC-135 had less than 10,000 pounds of fuel remaining for its own use. The boom operator, MSgt. Nathan C. Campbell, had earned his pay, saving no fewer than six Navy aircraft. Casteel's crew, including the copilot, Capt. Richard L. Trail, and the navigator, Capt. Dean L. Hoar, received Distinguished Flying Crosses for the action. The crew subsequently was awarded the Mackay Trophy.

## Forgotten Heroes

These awards validate the generally held view that the crew members of the KC-135 tankers are the forgotten heroes of the Vietnam War. From the Operation Pipe Stem RF-101 reconnaissance missions and the trans-Pacific fighter deployments in

*A Young Tiger trilevel aerial refueling by Maj. John Casteel, Capt. Richard Trail, Capt. Dean Hoar, and MSgt. Nathan Campbell (l–r) was among the most dramatic saves performed by tankers in the Vietnam War.*

1961 through the Operation Bullet Shot buildup of 1972, the men who flew tankers were the tightly coiled mainspring of Air Force combat operations.

The very first aerial refuelings in support of combat in Southeast Asia occurred on June 9, 1964, when four KC-135s gave prestrike refuelings to eight F-100s. Both tankers and receivers were part of the Yankee Team Tanker Task Force operating out of Clark AB, Philippines, against targets in Laos.

The Stratotankers—a name rarely used by the crews—were true force multipliers, equally vital to B-52 and to tactical fighter operations. Without tankers, the bomber operations from Guam would have been impossible, and the fighter force would have been virtually incapacitated.

The fighters needed the tankers at the beginning of a mission to top off tanks so that more ordnance could be carried over longer ranges. They needed them again for poststrike refueling, filling empty tanks so that strike aircraft, sometimes damaged and leaking fuel, could get home.

When the situation demanded, the tankers went inside the combat area to off-load fuel, even though officially forbidden to do so. Without the tankers, aircrew casualties would have been dramatically, perhaps prohibitively, higher. For these and many other reasons, the KC-135 tankers were key to the whole Vietnam conflict.

It is often overlooked that the Herculean work of the Southeast Asia tanker units was conducted while the majority of Strategic Air Command's refueling assets were dedicated to supporting the Single Integrated Operation Plan for nuclear war. The total burden of refueling activity fell on the KC-135s in 1964, when Tactical Air Command KB-50s and SAC KC-97s were retired. SAC was the single manager for its force of approximately 625 KC-135s, and it was hard-pressed to meet alert requirements, conduct training, support TAC, and sustain operations in SEA.

The hard truth was that, while these 625 tankers were adequate for their role in supporting a nuclear war operation, the number was insufficient to maintain that role and conduct a sustained conventional campaign. USAF compensated for the shortfall with the self-sacrifice of the tanker aircrews who took up the slack with long months of TDY in SEA alternated with extended alert duty when they returned home.

## Aircraft Well-Suited

The SEA tanker air and ground crews were able to achieve their decade-long success for a variety of reasons. They had the advantage of a designed-to-purpose tanker, one of the Air Force's great procurement decisions, the KC-135. Although underpowered for operations in the heat and humidity of Southeast Asia, and with performance sometimes limited by the length of available runways, the KC-135s were nonetheless well-suited for their task.

Far more reliable and easier to maintain than their piston-engine predecessors, the KC-135s were equipped with adequate navigation and rendezvous equipment, if not adequate electronic countermeasures gear. Fast, they were sometimes pushed beyond their .90 Mach training limit speed. Because they were pleasant to fly they made the long, demanding missions endurable.

The tanker aircrews, dedicated, disciplined, and well-trained, quickly adapted to radical changes in their operational routine imposed by combat conditions. For years they had serviced individual SAC bombers or TAC fighters on carefully planned simulated combat missions, where all refueling points, altitudes, frequencies, and off-loads were planned well in advance and with extreme care. All that changed in SEA, where the tankers had four primary and many secondary missions.

The first primary mission was to service the saturation bombing missions code-named Arc Light, refueling the formations of B-52s on their 12-hour missions from Guam. (No in-flight refueling was required for bombers from U Tapao, Thailand.) While differing from normal stateside practices in operational procedures, the Arc Light missions were relatively predictable and as routine as in-flight refueling can ever be. One tanker was assigned to one bomber for the inbound portion of the mission; some of the tankers then recycled through Clark AB for any required poststrike refueling.

The second primary mission was Young Tiger, which called for meeting the needs of the tactical aircraft in their raids on targets throughout SEA. The demands of Young Tiger were revolutionary: Tankers had to handle, on an ad hoc basis, dozens of fighters that were sometimes in danger of simultaneous flameouts from fuel starvation. The Young Tiger missions fostered entirely new concepts of flexibility and crew coordination, with the boom operator taking on an important mission management role. Mission planning times were severely reduced, and the conduct of the mission was continually adjusted to meet the current situation.

The third primary mission was more specialized, handling the refueling requirements of reconnaissance aircraft, from RB-47s (phased out by 1966) to SR-71s, the latter requiring dedicated KC-135Qs filled with the special JP-7 fuel used by the Blackbird. The fourth primary mission was to serve as electronic reconnaissance and airborne radio relay communications aircraft. These KC-135s remained on station for long periods but could be used for emergency refueling if required.

### Awesome Performance

The sheer number of refuelings and quantities of fuel transferred during the Vietnam War was staggering as indicated in the chart above.

By 1973, after nine years and two months of hard flying, these tankers had flown a total of 911,364 hours during 194,687 sorties. In the same period, they conducted 813,878 in-flight refuelings and off-loaded more than 8 billion pounds of fuel.

It was a titanic effort that went far beyond the mere physical transfer of fuel. The KC-135s permitted the Air Force and Navy to carry out operations with far fewer strike aircraft than otherwise would have been required, just as they allowed the US military to operate from bases as far from combat as Andersen AFB, Guam, and Kadena AB, Japan. They set the pattern for the future air combat operations in the Persian Gulf War of 1991.

## Gas and Go: Tanker Operations in the Vietnam War

| Year | No. of Tankers | Tanker Sorties | Fuel Off-loaded (lbs) |
|---|---|---|---|
| 1965 | 55 | 9,200 | 315 million |
| 1966 | 75 | 18,200 | 850 million |
| 1967 | 75 | 23,000 | 1.1 billion |
| 1968 | 94 | 32,000 | 1.6 billion |
| 1969 | 94 | 28,000 | 1.4 billion |
| 1970 | 91 | 19,540 | 888 million |
| 1971 | 51 | 14,400 | 619 million |
| 1972 | 172 | 34,700 | 1.4 billion |
| Total | 88 avg. | 179,040 | 8.2 billion |

***The sheer number of USAF aerial refuelings and the volume of fuel transferred in flight was truly staggering, as this chart shows.***

Curiously, the very success of the tankers in making a difficult task seem ordinary resulted in their receiving less credit from the Air Force and the public than should have been the case. An analysis of even a routine refueling operation shows manifest hazards. A 313,000-pound aircraft, flying at 26,000+ feet, at 300 knots, and carrying 100,000 pounds of fuel is perhaps not of itself impressive, but put that same aircraft within 40 feet of an even bigger aircraft, weighing 400,000 pounds, join them with a refueling boom, and you have a hazardous situation. Then try doing it at night, in foul weather, under radio silence, and in company with a mass formation of 50 other aircraft doing the same thing within a few square miles, and the hazardous situation becomes genuinely explosive.

Alternatively, have the tanker offloading fuel to a gaggle of fighters already past the critical fuel state, well inside enemy territory, and vulnerable to MiGs, flak, and SAMs.

In-flight refueling is dynamic, with the airflow at times tending to drive the aircraft apart and at times tending to draw them together. A B-52 refueling with a KC-135 will require forward trim to maintain clearance. As fuel is transferred, the flight characteristics of both aircraft change, requiring constant trim and power adjustments.


***At U Tapao, Thailand, a KC-135 takes on a load of fuel. USAF's designed-to-purpose tanker, though underpowered for SEA operations, was reliable and easy to maintain, thus helping to ensure the success of Young Tiger missions.***

### Individual Quirks

Each receiver aircraft had its own demanding characteristics. The F-4 had a very small receiver receptacle that required boom operator accuracy for boom insertion. A fully loaded F-105 required full power—sometimes using afterburner—to maintain its refueling position. If you add the emotional state of the pilots—just out of combat, worried about their fuel state, anxious to refuel and let their wingman on the boom—to the situations mentioned above, in-flight refueling becomes even more challenging.

As experience was gained, procedures were developed to make the system as safe as possible. On paper, in-flight fuel transfer took place in preplanned refueling areas containing specific points (Air Refueling Control Point—ARCP) for tankers

***The boomer's view: This KC-135 is equipped with a drogue–the round basket that the fighter aims for with his refueling probe. In this case, the F-105 pilot has one of the few fighters that can refuel using either the probe or drogue system. The small rectangle in front of the F-105's canopy is the refueling receptacle's door.***

and receivers to rendezvous. Electronic, radio, and visual means were used to effect rendezvous, but in Southeast Asia the intensity of air operations demanded that the Tactical Air Control System using Ground Control Intercept radar be used to track both tanker and receiver. Line of sight radar limitations were alleviated by higher flying tankers acting as relay stations for receivers until contact was established with GCI. The combination of onboard and ground equipment provided aircraft separation, expeditious rendezvous, and continuous control of the airborne refueling resources.

En route to the rendezvous point, the tanker formations flew with 500-foot altitude separation and 1-nautical mile nose-to-nose separation. The distance was maintained by use of search radar.

In the Young Tiger refueling operations, tactical aircraft were refueled along refueling tracks and at "anchor" refueling points that comprised a left-hand racetrack pattern anchored to the ARCP designated for use. The fighters flew shallow turns, receiving the fuel while flying in an elongated orbit. Vertical separation was based on a 500-foot altitude difference between tankers when flown in cell formation; many Young Tiger missions were flown as individual aircraft.

Prestrike and poststrike operations of tactical aircraft were conducted in refueling areas established over the Gulf of Tonkin, South Vietnam, Thailand, and later, over Laos and Cambodia. When large-scale strike operations were being conducted against North Vietnam, integrated refueling cells consisting of tankers, strike, ECM, MiGCAP, and SAM/AAA suppression aircraft were massed in relatively small geographical areas at the same time. The arming of ordnance precluded launching all of the receivers in the strike force at the same time, making it necessary for them to loiter with their tankers. Each aircraft would recycle onto a tanker boom to "top off" until the entire force was assembled and ready to depart. As many as three refueling cells each with three tankers and 15 receivers—54 aircraft total—could be refueling at different altitudes at the same anchor refueling point.

Poststrike refueling for tactical aircraft was less susceptible to preplanning. Tankers reacted to the situation as they found it, giving fuel to those who needed it most first, including Navy aircraft. (There were no scheduled missions to refuel Navy aircraft, and emergency refueling depended upon having compatible refueling equipment.)

## Over the Fence

The salute "Thanks, that's a save" became one of the most honored of the war, and it was earned by many Young Tiger crews. There were in fact so many saves recorded that it became necessary to have the term formally defined to mean instances when, without emergency refueling, the tactical aircraft would certainly have been lost.

Many, perhaps most, of the saves were not officially recorded because they had been executed "over the fence," that is, inside enemy territory where the tankers were forbidden to go. The tanker crews didn't report such saves because they wanted to avoid the disciplinary actions that would have followed, unjust as such action might have been. The fighter crews didn't report them because they didn't want to jeopardize the tanker crews—and perhaps deter them from making another save under similar forbidden conditions.

Disregarding the danger of being the most valuable—and most vulnerable—of targets, the tanker crews ignored the prohibitions and did what they had to do in order to save the hard-pressed strike aircraft.

The stories of Young Tiger saves are legion. Following are two that typify the bravery and the skill of the tanker crews and the persistence of the fighter pilots who would go to almost any lengths to avoid losing their aircraft to fuel exhaustion.

In May 1967, a KC-135 flown by Maj. Alvin L. Lewis battled through violent thunderstorms to locate two F-105s that were critically short on

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fuel. Lewis found the F-105s in a clear area, and put his tanker into a 20-degree dive so that he could position himself in front of the first fighter, which had already flamed out. The Thud was gliding earthward, its pilot preparing to eject, when the diving tanker passed in front to a refueling position. All check lists and preliminaries were forgotten as the F-105 hooked up and took on enough fuel to air-start the engine. The tanker transferred a little fuel, then increased its dive angle to 30 degrees to get enough air through the intake of the fighter to spool it up to starting RPM. Lewis then refueled the second F-105, itself now about ready to flame out. Both 105s made it home.

The rules of engagement for the tankers were severe. Tankers were prohibited from flying too far north, from giving more than the allocated fuel to a receiver, or from giving fuel to an unauthorized receiver. The authorities were vigilant, and instances of Article 15s or worse for violation of the rules were not uncommon. Therefore, tanker Aircraft Commander Capt. Herman L. Byrd was stunned on March 8, 1967, when asked by Brigham Control, the GCI station at Udorn, Thailand, if he would go into North Vietnamese territory where four F-105s were reporting a critical fuel state.

Byrd recognized that going would put his aircraft and crew at risk to flak and SAMs—but he was more worried about the possible punitive administrative actions that could follow. He polled his crew and they unanimously decided to go in.

His navigator, Capt. Vernon Byrd (no relation), agreed that he would monitor the vectors from GCI and try to navigate to the F-105s on the safest route, avoiding known antiaircraft sites. The navigator on Young Tiger crews assumed a critical role. He had the charts plotting enemy air defenses and had to determine the fastest way to get to the target aircraft while circumnavigating the danger points. He also had to calculate the escape route and heading after the join-up and determine how to manage the unscheduled off-load.

The amount of crew coordination required was extreme, with the navigator guiding, the pilot flying, the copilot monitoring the situation and operating the air refueling pumps, and the boom operator conducting the refueling process.

GCI vectored Byrd's tanker into a left turn, just as the Thuds appeared. The fighters had already determined which one needed fuel first, and they slid in without the usual procedures. The No. 3 Thud latched on to the boom for a quick thousand pounds of fuel before disconnecting. The other three 105s did the same, then all four recycled to top off their tanks.

Byrd and his crew had broken all the rules—but they had saved four F-105s from destruction and four pilots from spending the next six years in the Hanoi Hilton.

Thanks to the skill of the tanker crews, the success of the Tactical Air Control System, and the positive influence of the MiGCAP fighters, no KC-135 was lost to enemy action. Only four tankers crashed during the entire war, despite the massive number of sorties and frequency with which tankers went in harm's way over North Vietnam to assist fighters desperately low on fuel. The tanker war in SEA was truly a splendid effort, one that deserves to be remembered. ■


Photo by Ken Hackman

***Aerial refueling by KC-135s allowed the Air Force and Navy to operate from locations far removed from combat in Southeast Asia, a precursor to the way air combat operations would be carried out in the Persian Gulf War.***

***The decisions made on the flight deck of the KC-135 were sometimes risky ones—exposing tanker crews to flak and SAMs and Article 15s as they broke the ROEs to refuel fighters over enemy territory.***