Contents

Preface

In the summer of 1974 the CIA executed a clandestine recovery mission in the central North Pacific Ocean.[1] The recovery target was a Soviet Golf II–class submarine, *K-129*, that had sunk for unknown reasons six years earlier. The recovery vessel was named the *Hughes Glomar Explorer.* The program was code-named AZORIAN.[2]

On February 7, 1975, the *Los Angeles Times* exposed the recovery mission on the front page of its late edition. The exposé was followed within a few weeks by many more articles in nationally distributed newspapers and magazines, putting an end to any possible plans for future espionage missions with the *Explorer*.

Since that time, at least three books have been written purporting to tell the "true story" of the CIA's recovery program, and more than half a dozen books have addressed some aspects of the program and its results within their pages. None of these books—using mainly second- or thirdhand information—has portrayed an accurate and complete history of the recovery mission itself. Attempts to tell the story of the CIA's role in the development and operation of the recovery system, or the creation and execution of the complex security plan that enabled the recovery mission to be performed clandestinely, have been little more than uninformed speculation. The CIA has kept its secrets well.

AZORIAN is the most fascinating example of what has sometimes been described as the technical arrogance of the CIA's Directorate of Science and Technology during the Cold War years. The CIA has said very little about the program since it was exposed in 1975. The agency initially acknowledged only that it was the owner of the *Hughes Glomar Explorer*, and that the ship was built for the

purpose of collecting intelligence. In 1992, however, the director of central intelligence (DCI), Robert Gates, acknowledged to the president of the Russian Federation, Boris Yeltsin, that the *Explorer* had been involved in a partially successful attempt to recover a portion of the *K-129* submarine. Gates also hand-delivered a visual record of the burial-at-sea ceremony for the six Soviet sailors whose bodies had been recovered along with parts of the submarine.[3] After Gates's visit to Moscow, the CIA remained silent on the subject of AZORIAN until January 2010, when special circumstances forced them to release a heavily redacted history of the program through Freedom of Information Act (FOIA) channels.

In the summer of 2007, after reading one more book on the *Hughes Glomar Explorer* program that was full of inaccuracies and absurd conspiracy theories, I suddenly realized four sobering facts: (1) The true story of the CIA's role in the *Glomar Explorer* program has never been accurately documented; (2) there was almost no institutional memory of the program remaining in the CIA; (3) I was one of the last remaining members of the CIA program team who had been heavily involved with all phases of the program, from concept development through operations, and all aspects of the program, including engineering, security, program management, and politics; and (4) I wasn't getting any younger. If I didn't write the story, who would be left to tell it?

I started to write. I had lots of memories about the program, as well as my personal notebooks that I maintained while on the ship from 1973 through 1975. I also had a copy of the unclassified deck logs of the *Hughes Glomar Explorer* for the entire period of the 1974 recovery mission. I thought I had enough material and memory to write the history. I was so wrong. I hadn't realized how much my memory had faded over thirty-five years. Every part of the story I wrote down brought up new questions that I couldn't answer. I realized I was going to need help.

The obvious sources for the help I needed were those program participants—both government and contractor—who had worked together to achieve such amazing results. I knew their names, but I didn't know where they lived or which ones were still alive. I had to find those guys and see if they'd be willing to help me fill in the blanks in my own memory.

My first contact was with R. Curtis Crooke, the former president of Global Marine Development Inc. I had kept in touch with Curtis over the years and knew where to find him. Curtis, in turn, got me back in touch with Sherman Wetmore, the chief Global Marine engineer on the ship

during the mission, and with Oscar "Ott" Schick, the Lockheed program manager who oversaw the construction of those parts of the recovery system built by Lockheed's Ocean Systems Division. Sherm then introduced me to Michael White, a European film producer and remarkable researcher who was creating his own historical film of the AZORIAN program.

Eventually, this chain of contacts developed into a network of government and civilian friends who were able to fill in the blanks in my memory. More than that, though, they provided new information and stories that I had never known about. Especially satisfying was the opportunity to get back in touch with old friends that I hadn't heard from for many years.

By June 2008, I had a draft manuscript completed. As a former CIA employee, I'm required by law to submit any book or article that I want to publish to the agency's Publications Review Board (PRB). The PRB performs an "expedient" review—with a thirty-day goal—of a submitted manuscript and provides the author with a revised copy containing appropriate recommendations for redactions or changes that are needed to protect national security. I submitted my manuscript on June 24, 2008.

About three months later, I received a letter from the PRB requesting a meeting to discuss their concerns about the publication of my book. At the meeting, I was told that publication of a book about AZORIAN would likely "cause serious harm to national security," and that therefore *not one page* of the manuscript could be published. The PRB also informed me that I had a right to appeal the decision, in which case a senior CIA official reporting directly to the director of Central Intelligence would make a final ruling on whether *any* of my manuscript could be published.

With the help of my legal counsel, Mark Zaid, I prepared an appeal to the board's decision. The task of preparing the appeal was made significantly harder because of the board's refusal to allow Mark (who held a secret clearance) to read my manuscript. In January 2009, I submitted the appeal to the assistant deputy director of Central Intelligence (ADD/CIA).

Almost four months later—and still with no response to my appeal—I was informed that the PRB was reviewing the manuscript again to determine just what parts of the book might be publishable after all. Unfortunately, the PRB chose to redact almost all material that had not already been *officially* acknowledged by the CIA, even though the same material had been previously exposed in numerous open-source publications. Puzzlingly, the PRB also redacted material in my book about which the CIA had no knowledge. The PRB essentially took the position that even though they could not ascertain whether some of the events described in the book actually occurred, they were redacted because if they *had* occurred they would be

classified. I never received a response to my first appeal, nor any explanation of the reasons for redaction of more than one-third of the words in my manuscript.

In January 2010, I submitted a second appeal to the ADD/CIA requesting permission to publish my manuscript. Five months later, I still hadn't received a response. My queries to the PRB for the status of my appeal were answered: "Your appeal is being processed."

Finally, I sent a letter to the board advising them that if I received no response within thirty days, I would be forced to consider other options available to me—including litigation. I sent copies of my appeal letter to the director and deputy director of the CIA, to Senator Barbara Mikulski (my senator from the state of Maryland and a member of the Senate Select Committee on Intelligence), and my attorney, Mark Zaid.

Within thirty days, I received a formal response from the CIA signed by the CIA's associate deputy director. Almost all of the material in the book was now approved for publication. Even more satisfying, the redactions that were sustained in the ADD/CIA's response were understandable and reasonable. I can only speculate as to why the agency had such a change of heart regarding publication of my book, but I was extremely gratified. After two years of frustration in the CIA's publications review process, I finally had a manuscript that I was permitted to send to a publisher.

With the help of many friends and shipmates, I've prepared a history that is as close to true as I can make it. That said, there are some caveats that apply.

The names of most of the CIA officers in the book are pseudonyms. Revealing the true identities of employees whose CIA affiliations have not been previously exposed would be an invasion of their personal privacy and could create security problems for them and for the agency. The names of senior CIA officers whose identities have been previously exposed in the media are real.

The names of several government agencies and commercial corporations that collaborated with the CIA on the AZORIAN program are not mentioned. For those agencies and organizations, revelation of their CIA association could be awkward. The names of contractors and government organizations that routinely and openly contract or collaborate with the CIA on other programs are included in the manuscript.

Finally, I must acknowledge that my memory is far from perfect. Even my program associates disagreed on the timing and details of some of the incidents recalled in the book. To those veterans of the AZORIAN program who may detect some errors in my story, I apologize beforehand. I'm sure

there are some differences of opinion that will arise, and perhaps some outright errors will be found. I feel confident, however, that these transgressions will not materially affect the overall validity of this history.

The engineering, security, and operational histories of the AZORIAN program are impressive and historically significant. The stories of the dedicated CIA officers and contractors who persevered to pull off this remarkable mission are inspirational. Their efforts deserve to be documented definitively and accurately. That is the purpose of this book.

The CIA's Greatest Covert Operation

1

Genesis

A Soviet Submarine Is Lost—and Found

In early March 1968, for reasons still under dispute, a Soviet Golf II–class submarine with hull number PL-722 sank in about 16,700 feet of water in the central North Pacific. The sub (designated by the Soviet navy as *K-129*) was a diesel-powered boat, although it carried three nuclear missiles and two nuclear torpedoes.[1] It had an overall length of 330 feet, weighed about 2,500 tons, and normally carried a crew of eighty-three men. The *K-129* wasn't a fast boat. It could manage a speed of about fifteen to seventeen knots on the surface, and about thirteen knots submerged. That was fast enough, though, to enable it to sail from its home base near Vladivostok to a typical patrol station within a few hundred miles of Hawaii in less than ten days. With an endurance of seventy days, it could spend well over a month on station before returning back to the Kamchatka Peninsula.

The *K-129* had left its home base of Ribachiy, near Petropavlovsk on the Kamchatka Peninsula, on or about February 25. It was following a route to its likely patrol station 700–800 nautical miles northwest of Hawaii. From there it would be available for nuclear attack on U.S. targets if the Cold War suddenly became hot.[2]

But the *K-129* never reached its designated patrol station. Its covert, submerged transit toward Hawaii was interrupted by a violent and fatal incident that resulted in the loss of the submarine and all of its crew. The sub's position, when it sank, was almost exactly at the geographic coordinates 40° N, 180° W, an area of the ocean

frequently traveled by Soviet submarines on routine operational patrols in the North Pacific.

When the *K-129* failed to make its scheduled communications report to its fleet command headquarters on March 7, the Soviet Pacific Fleet commands tried desperately to reestablish communications with the sub. There was no response from the *K-129*. On March 9, the Soviets concluded that their submarine had been lost. The next day, naval headquarters in Moscow approved a massive search effort to find the *K-129* and, hopefully, to rescue any survivors. Although the Soviets had no evidence to explain the loss, there were strong suspicions that a U.S. Navy ship or submarine had been involved.[3]

The assumption of U.S. involvement, even without any supporting evidence, was understandable if not provable. During the late 1950s and 1960s, both the United States and the Soviet Union were driven to take dangerous risks in probing each other's military might and preparedness. This jousting routine of threats, bluffing, and probing sometimes slipped over the line into actual physical conflicts. Airplanes and pilots from both sides were lost without official explanation while engaging in these tactics. In the oceans, both commercial and military ships sometimes fell victim to overzealous tracking or harassment exercises.

No services participated more actively and frighteningly in these Cold War conflicts than the submarine corps of both states. With land-based intercontinental ballistic missile (ICBM) locations having been identified and targeted by both parties, the nuclear weapons carried by submarines became the tie breaker that could potentially tip the balance of a nuclear war. In order to monitor the locations and identify the operational procedures used by these missile-carrying subs, both the United States and the USSR were willing to take major risks. These underwater cat-and-mouse games brought both countries' subs into close contact. Sometimes too close. Many near incidents and some actual collisions between submarines, or between a submarine and a surface ship, had already occurred.

At the time of the *K-129* loss, both the United States and the USSR were growing increasingly disturbed by these dangerous ocean maneuvers. Concern went beyond the accidental loss of ships and lives. These incidents could potentially turn the Cold War into World War III. The United States forcefully denied having any knowledge about the cause of the *K-129*'s loss. The Soviet Union was unconvinced.

Whatever the cause of the sinking, the Soviets understandably went into a crisis mode when they lost contact with their boat. Their concern for the possible loss of a submarine with its ninety-eight crewmen was heightened by the fact that the boat carried nuclear weapons.

They immediately sent out an armada of surface ships and submarines to search for the lost Golf II. The search was intense and covered a wide area. However, they had only an approximate idea as to where the sub's position might be and only limited search technologies to apply to the effort. Their emergency responses to the loss were essentially confined to attempting communication with the submarine using radio and acoustic signals and, failing to communicate, searching for oil slick, debris, or survivors from a boat that had presumably sunk.

Sonar was also used by both the surface ships and the submarines to attempt location of the boat on the ocean bottom. This was a hopeless task, though, since any sonar return from a sunken submarine at a depth of nearly 17,000 feet would be masked to a large degree by the acoustic returns from the ocean bottom. Eventually, the search was called off. Although certainly devastated by the loss of a submarine and its crew, the Soviets felt confident that the extreme water depth in the search area, coupled with the large size and mass of the submarine, precluded any concerns that the wreckage of the boat and its weapons might fall into the hands of a foreign intelligence service.

The significance of the *K-129*'s demise wasn't lost on the United States. Although confident that no U.S. naval vessel had been involved in the incident, responsible government officials recognized that the tracking and harassment tactics currently being employed by the navies of the United States and the USSR had raised the potential for the occurrence of such a fatal collision. There was genuine concern over the impact that such an incident could have on the relations between the two countries. In March 1968—while the Soviets were still searching for their lost submarine—the United States invited the Soviet Union to participate in the formulation of a bilateral Agreement on the Prevention of Incidents On and Over the High Seas.

The Soviets couldn't find their submarine, but the U.S. Navy thought that perhaps it could.[4] Once it was clear that a sub had been lost, acoustic ana-

lysts under the command of Captain Joseph Kelly began looking at the signals from the Navy's Sound Surveillance System (SOSUS) and the hydrophone arrays built by the U.S. Air Force Technical Applications Center (AFTAC),[5] a system of acoustic sensors used during the Cold War to detect the presence and track the routes of Soviet submarines, and to geolocate the impacts of ballistic missiles that had been test-fired by the Soviet Union. These sensors, with a range of thousands of miles, were used operationally in both the Atlantic and Pacific Oceans. All of the SOSUS and AFTAC detection systems, some of which were colocated, were operated out of U.S. Navy facilities and ships.

Analysts looking at the acoustic records for the time frame in which the *K-129* was believed to have sunk were able to identify a set of signatures that were consistent with the sounds that would emanate from a sinking submarine. Using these signatures, recorded at several of the AFTAC acoustic array sites, they were able to pinpoint the location of the event to within a circle about four miles in diameter.[6]

With this discovery, the Navy planned an underwater search mission aimed at finding the lost submarine. For security reasons, the CIA has refused to allow me to publish any details of the Navy's underwater search capabilities or the results of the search mission. Knowledge of this capability was (and still is) restricted to those with appropriate clearances and a need to know.

However, other authors writing about the search for *K-129* have consistently suggested that the search vehicle was the USS *Halibut*, one of the earliest U.S. nuclear-powered submarines.[7] The *Halibut* was originally designed to launch ballistic missiles, but was later modified to perform a wide range of other special missions.[8] Without confirming or denying the popular belief that the *Halibut* was the vessel that located the lost Soviet submarine, it was determined that the *K-129* had not simply broken into many pieces when it struck the ocean bottom; much of the sub was still intact. Authors Sherry Sontag and Christopher Drew wrote, "Although severely damaged, the submarine looked basically intact. . . . Inside the first [silo] was twisted pipe where a nuclear warhead had once sat calmly waiting for holocaust. Inside the second silo, the warhead was completely gone. The third silo was intact."[9]

The U.S. government has never released any photographs of the *K-129* wreckage to the public, in spite of many requests made under the Freedom of Information Act. In fact, the government currently refuses to confirm or deny that such photographs ever existed. Several authors, however, have described the sunken submarine based on first- or secondhand information.

In *The Universe Below*, William J. Broad quotes an unnamed project architect who asserted that the sunken submarine was badly broken up. However, Broad's source went on to say, "The only section deemed interesting enough for retrieval was an intact section of the bow and center structure that measured some two hundred feet in length."[10] CIA's recovery efforts were focused on recovering that section. It was referred to as the target object, or sometimes just the target.

Sherman Wetmore, who was Global Marine's chief engineer during the *Hughes Glomar Explorer* (*HGE*) mission and had personal access to photos and video recordings of the *K-129* on the bottom, also described the target object in a speech he presented to the American Society of Mechanical Engineers at a ceremony memorializing the *HGE* in 2006. Wetmore said, "[It was] generally oblong but not symmetrical; having a length of 160 feet, a width of 64 feet and a maximum height of 55 feet." As for the weight of the target object, Wetmore said, "2,000 tons was the best estimate given to us as baseline criteria."

This was exciting. If the United States could somehow gain access to that target, it could confirm the existence of nuclear missiles on the Golf II–class sub, learn what materials were used, and analyze the construction of the warheads. There were other potential intelligence prizes as well. Access to the control room in the sail—the vertical structure above the submarine hull—might permit recovery of the ship's logs, communications and cryptographic systems, codebooks, and operating manuals. This information could give the Navy the capability to monitor and read classified Soviet communications, providing a tremendous tactical advantage in the continuing Cold War task of maintaining an accurate track on the location and movements of all Soviet submarines.

With the support of the entire U.S. government chain of command, from the president down to the chief of naval operations, Admiral Thomas H. Moorer, the Navy put its most experienced underwater scientists to work on the task of devising a way to recover the secrets from the Soviet sub.[11] This team included Captain Jim Bradley, a submariner who had cut his teeth on diesel boats and was currently responsible for planning underwater espionage missions for Admiral Hyman Rickover's nuclear fleet. The team also included Dr. John Craven, a senior Navy scientist who was on the special intelligence task force responsible for finding the *K-129*.

The team, led by these two men highly experienced in submarine operations, came up with a predictable—if not necessarily practical—recommendation. They proposed to use a small mini-sub to descend to the target. The mini-sub would use much of the technology then being used by Craven

for the Navy's Deep Submergence Systems Project,[12] which included development of the Deep Submergence Rescue Vehicle and the Deep Submergence Search Vehicle, the latter being designed for research and search-and-recovery missions down to a depth of 20,000 feet.[13] Under the Navy's plan, the mini-sub would plant small explosive charges on selected portions of the *K-129* sail to blow away steel plates, permitting access into the sail area. Remotely controlled appendages attached to the mini-sub would reach into those openings and recover the intelligence objects of interest, returning them to the surface for exploitation. Some tests were reportedly run to verify that the explosives technology could actually create penetrable openings in the sail without destroying the equipment or files to be recovered.

Unfortunately for Craven and Bradley, Admiral Moorer wasn't impressed with the scheme.[14] He dismissed their ideas of selective recovery of the missile warheads and the cryptographic and communications equipment.[15] He had serious reservations about the use of explosives to surgically open the submarine without destroying the valuable contents, and he questioned the ability of mini-subs at depths of nearly 17,000 feet to remove and recover intelligence artifacts as small as a codebook and as large as a nuclear warhead. Besides, he was impressed with the fact that the main section of the submarine seemed to be substantially intact. Why not, he reasoned, go after the whole thing? And, in so doing, make up in some part for the loss of the USS *Pueblo,* which had been captured by the North Koreans in 1968.

To the chagrin of Bradley and Craven, Admiral Moorer told his superiors that the Navy had no workable plan to exploit the sunken Soviet Golf II class. Moorer went on to say that, in his opinion, if a way to recover large portions of the submarine could be developed, the value to the country would be immense. Other key members of the intelligence community felt the same way. The potential intelligence coup was too valuable to just forget without looking for other ideas. They decided to go to the CIA to see if its new, ambitious team working in the area of underwater espionage could come up with a scheme for recovering the entire target.

CIA Gets in the Game

On April 1, 1969, Deputy Director of Defense David Packard sent a letter to DCI Richard Helms asking him how his agency might propose to exploit the sunken Soviet sub.[16] Helms was understandably cautious. After all, the CIA was not noted for building ships and had only limited experience in marine engineering. Spy planes? Satellites? Yes and yes. But most of its previous ocean espionage activity had been in support of the activities of other

agencies or services. Still, he passed the question down to Carl Duckett, the newly appointed deputy director for science and technology (DD/S&T).

If Richard Helms was somewhat diffident about getting into the submarine salvage area, Carl Duckett did not share that reluctance. He jumped at the opportunity to study the problem and offered to pull a team of scientists together to explore all possibilities. This was the kind of special challenge that Duckett loved.

Buoyed by Duckett's confidence and his own enthusiasm for the collection of intelligence by technical means, Helms told Packard that he believed the CIA might, indeed, be able to bring some new ideas to the exploitation challenge. He asked for two months to study the problem. Packard agreed and designated Dr. John Foster, director of defense research and engineering (DD/R&E), as his focal point for coordination.

Carl Duckett had been an unusual and controversial choice for the position of DD/S&T. Although a skilled technical manager, Carl Duckett did not even have a college degree. He had an impressive background in missile technology, though, and very good technical instincts. Carl had some other special talents as well. He had a keen memory and the ability to influence people and win them over to his cause. He made friends easily and socialized frequently with key members of Congress who could usually be relied on to support his cause—whatever it might be. Duckett was a popular manager of his own people, too. Summarizing his leadership style, he was easy to talk to, he listened well, and he always remembered a person's name.

Duckett's choice to head up the CIA project team was John Parangosky. Parangosky had great credentials as an R&D manager in the CIA, but he had no experience with any type of marine engineering or underwater operations. He had started his career working for Richard Bissell in the CIA's Plans Directorate as a senior officer at a U-2 base in the Middle East, but he later became involved with the R&D of what were then referred to as *special systems* for the collection of technical intelligence. (Prior to the formation of the National Reconnaissance Office (NRO) and the CIA's Science and Technology Directorate in the early 1960s, the U-2 operations were managed in the Plans Directorate, now called the Operations Directorate.)

In 1958 Parangosky had been placed in charge of R&D for the A-12 (or OXCART) hypersonic reconnaissance airplane, which was intended to replace the aging and increasingly vulnerable U-2 for intelligence collection over Soviet territory. In 1961, as OXCART entered the flight test phase in Nevada, Parangosky and his R&D staff also took on a major role in the development of the CORONA reconnaissance spacecraft. The CORONA program was the first major space challenge undertaken by the newly formed

National Reconnaissance Office, an organization created to coordinate the efforts of both the CIA and the Air Force in the use of overhead reconnaissance to collect strategic intelligence from behind the Iron Curtain. He was remarkably successful in all these endeavors and was regarded as something of a miracle worker.

Parangosky had another characteristic that made him a good choice for the new program. He was almost fanatically obsessed with the need for good security. He was even very sparing in the disclosure of his name. Most contractors knew him only as "JP."

Given the challenge of recovering the *K-129*, Duckett gave Parangosky free rein to choose six or seven engineers/scientists from the vast technical resources of the DD/S&T. I don't know what criteria Parangosky used to cherry-pick agency personnel for his special study group, but it's pretty clear that either there were no experienced marine engineers in the agency or else he just didn't place high emphasis on prior experience in ocean engineering. The initial full-time study team consisted of about seven men with very diverse backgrounds.

Dr. Earnest Ruggles was an oceanographer working for the Science and Technology Directorate's Office of Research and Development (ORD), a scientific office that investigated cutting-edge ideas and technologies. Ruggles had been working with a special group exploring the possibilities for intelligence collection from the marine environment. He'd heard that there was a new program being formed around John Parangosky. Ruggles was interested, and he asked his close friend, Dr. Jack Sparkman, if he'd be interested in moving to the new project with him.

Jack Sparkman was a senior chemical engineer from ORD. He'd never had an opportunity to work on a large program, and he was excited about the possibility. Sparkman and Ruggles both went to talk to Parangosky. Sparkman recalled that his first impression of him was that he was all business. Sparkman reflected later, "His only interest seemed to be his program—and to hell with anything else or any other part of your life!" Sparkman figured that was just the right attitude for a program manager. He and Ruggles both signed up on the spot. They hadn't even been briefed on the program yet.

Another member of the original AZORIAN team was Jack Mahoney, an innovative mechanical engineer with an impressive background in aeronautics and space systems. A natural at solving tough engineering problems, he quickly recognized a satisfying challenge when he saw it. And the mission that Parangosky described to him sounded very challenging, indeed.

Other early members of the team included Bill Rivers, a former Air Force captain and an excellent administrative officer; Alex Hausman, a highly re-

spected physicist and mathematician; Paul Eastman, a senior member of the agency's office of security; Doug Conrad, Parangosky's deputy and a close friend of Carl Duckett; and me, an electronics engineer with mostly aircraft experience. On a part-time basis, Parangosky was also able to get the services of Frank Hillcrest, an intelligence expert on Soviet submarines.

I got hired onto the staff in typical Parangosky fashion. I was finishing my second year of graduate work at the University of Virginia—under the sponsorship of the CIA—when I received a call from him.

He said, "Dave, I've found a new job for you that you're going to love!"

I asked, "Can you give me an idea of what the job is?"

"No."

"Do I have a choice, John?"

"No."

"How much time can you give me before reporting?"

"Be here next week!"

I chafed a little about being unable to negotiate anything, but I knew Parangosky well enough to have confidence that he wouldn't bullshit me about having a job that I was "going to love." I was also sure that the job would be exciting. Working for JP was *always* exciting. I showed up the next week.

Among the nine of us, only Earnest Ruggles and Frank Hillcrest had real knowledge of any aspect of the oceans or the vessels that operated on or within them. None of us had any prior experience with actually building large systems to operate in the ocean. Looking back, we were an unlikely group to be taking on a marine engineering task that the chief of naval operations had declared "probably impossible."

Parangosky's capabilities as a program manager were obvious, but he in no way fit the stereotypical model of a successful manager of large R&D programs. To begin with, he had no formal technical education. He had some training in law, and by some accounts was a very competent violinist, but his grasp of mathematical and engineering concepts was meager. He made up for his lack of technical skills with a prodigious appetite for reading about current progress in science and engineering, and a highly developed ability to sense whom he could trust for technical guidance.

On the OXCART program, it had been Kelly Johnson, head of Lockheed's Skunk Works in Burbank, that Parangosky trusted and used for a sounding board. This is not to say that John Parangosky and Kelly Johnson had a completely smooth relationship. I witnessed many heated arguments between the two over technical and schedule issues. In the end, though, Parangosky nearly always took Johnson's advice. And, as it turned out, that was pretty smart. It was almost always good advice.

Parangosky also had a fierce temper and could be irrational in his arguments. If displeased with a contractor's performance, he'd threaten to terminate the contract, and sometimes he followed up the threat with action. His own staff often got the same treatment, some of whom were "fired" more than once. However, he almost always gave the injured party the opportunity to bring himself back into good graces. I suspect that in most cases his irrationality was intentional, to keep his staff and the contractors from ever getting complacent.

I was fired twice by John Parangosky, most memorably in 1964 when I was a young man working at Area 51 of the Nevada Test Site on the OXCART flight test program. I was notified through Air Force channels that our planes were being tracked by USAF air defense radars during some of their test flights. That was not supposed to happen. The A-12 was a stealth aircraft, and the CIA's experts in this area believed that the radar signatures of our aircraft were too small to be tracked by either U.S. or Soviet radars. I drove out to one of the radar sites at Angel's Peak, Nevada, to see for myself. Much to my surprise, the Air Defense Command actually was tracking our hypersonic 2,000 mph aircraft, which was still so secret that few Air Force officers had even been briefed on it.

When I reported my findings to Parangosky, he said, "Don't tell me that! It's impossible. I don't want to hear it." When I pressed my case, he shouted over the telephone, "You're fired! Pack your bags and go home!" The CIA manager of the Nevada flight test facility overhead the conversation, looked at me, and shrugged. "He's the boss," he said.

Fortunately for me, my supervisor, Norm Nelson, was as hard-nosed as Parangosky. He was Kelly Johnson's right-hand man at the Area 51 test site and later distinguished himself as the program manager for the Lockheed F-117A stealth fighter and general manager of the Lockheed Skunk Works. Nelson waited a day, then he called Parangosky back and convinced him that I should get another chance. Of course, the fact that the agency's own stealth experts conceded shortly thereafter that the OXCART vehicle wasn't invisible to radar after all probably helped convince Parangosky that I wasn't a totally lost cause.[17]

The sensitivity of the new study effort was such that Parangosky was unwilling to brief any outsiders on his work. He knew, though, that we'd have to have at least one contractor to provide technical support to our group. He chose a small West Coast engineering company that had supported the agency on several other programs, mostly in the space arena. Although not

an apparent match for the work to be done, this company had an existing contract with the CIA and a cadre of personnel with top secret security clearances. We only had two months to come up with a concept credible enough to warrant additional funding and analysis. There wasn't time to establish new contracts and clearances for a company with marine engineering credentials. We couldn't afford to waste time trying to hire experience.

That said, our contractor's engineers were an impressive set of talents. The CIA core staff and our new engineering support company made a good, cohesive, technical team. In addition, we all shared the common credential of zero experience in ocean engineering.

Our first concepts were, not surprisingly, unimpressive. One of the very early ideas called for using mini-subs to attach rocket boosters to the *K-129*, then launching the target to the surface. I realize this sounds incredibly naive (and it was), but most of the AZORIAN technical team's previous experience was in airplanes and/or satellites. As the old saying goes, "To a hammer, every problem looks like a nail." Besides, Carl Duckett had worked previously with the ballistic missile people in Huntsville, Alabama. The idea of using boosters to raise the submarine sounded perfectly reasonable to him, who was jokingly referred to as "Mr. Rocket" by some of his friends in Congress. We finally realized that even if we were able to attach the boosters and launch the target to the surface, what would we do with it then? How would we keep it on the surface? I don't want to belabor the flaws in this approach. I just want to point out how much we had to learn when we started the AZORIAN program.

Another approach, slightly more mature, called for using a submersible to attach flotation bags or pontoons to the target. Once attached to the hull, the flotation bags would be filled with enough gas to create positive buoyancy that could lift the target to the surface. The gas for the pontoons could be generated on the seafloor—either chemically or by electrolysis—or, we could pump air from a ship through a long pipe or tube to the ocean bottom. Both approaches had technical issues that would have to be solved. There was precious little information available on how to generate large quantities of gas at pressures of 7,500 pounds per square inch (psi), or what kind of compressors would be required to pump air down a three-mile-long pipe. We knew the compressors would have to operate at pressures of at least 5,000 psi, and the pipe would have to be able to withstand the same pressure. For sure, automobile radiator hose wasn't going to do the job.

Even recognizing the problems ahead, the CIA team was undaunted. They were confident they could find a workable approach for recovering the G-II sub. Dick Helms and Carl Duckett backed Parangosky and his staff

all the way. In mid-July 1969, Helms briefed David Packard on the progress of the agency's effort and requested authorization to continue the work. Packard, perhaps impressed more by the enthusiasm of the program team than by the actual study results, agreed to extend the CIA's efforts. The Special Projects Staff went back to work eagerly. We were sure we could find a workable way to float the target to the surface.

Then, Frank Hillcrest (the only guy on our team at the time who really knew submarines) blew our concept to smithereens. He pointed out that we had no idea how many air bottles might still be on the target with compressed air in them. As the target was raised, this air would expand, perhaps leaking out of the tanks into the hull of the submarine. Would the air just leak out of the hull? Or would it keep expanding, contained within the hull, creating constantly increasing buoyancy that we had no way of controlling? There was a real probability that the target could go into an uncontrolled rate of ascent, breaking the surface near to (or even under) the ship. In other words, our quarry could become our hunter. And even if the submarine reached the surface without damaging the ship, what would we do with it then? Tow it home in plain view across thousands of miles of open ocean—while the Soviet navy watched? We scrapped that idea, too.

After a couple of weeks, a collaboration among Jack Mahoney, Jack Sparkman, and our technical support contractor resulted in a new, more comprehensive approach. Our plan was to build a large steel barge with a *keyhole* in the center that would just fit around the target object. The barge would be filled with pentane for buoyancy and weighted down with steel ballast approximating the estimated weight of the target. Pentane was selected as the buoyancy medium because it had a relatively low coefficient of expansion with pressure and with temperature. The buoyancy of the pentane would remain fairly constant at different depths and pressures. The ops concept was to tow the pentane-filled barge to the recovery site, where it would be loaded with enough additional ballast to make it negatively buoyant. Then, supported by six very large nylon cables wrapped around powered winches, the barge would be lowered to the bottom. During the final stage of lowering, the keyhole would be aligned with the target and the barge would descend the rest of the way to the bottom. Once the target was within the keyhole, it would be locked into place by an arrangement of sliding wedges. Ballast would then be jettisoned from the barge—now with the target enclosed—until it could be lifted by the nylon lowering/lifting cables. When the target had been raised to the surface, more ballast would

be dropped so that the barge became positively buoyant on its own. It could then be towed, with the target concealed in the keyhole, to a secure location for exploitation.

The new concept wasn't perfect. Like our previous ideas, it had some serious technical and operational issues. For example, the volume of pentane required to fill the barge was equal to two years' worth of the total worldwide pentane production. And, we hadn't yet addressed how we would explain the strange behavior and mysterious mission of a pentane-filled barge in the middle of the North Pacific Ocean. In spite of the weaknesses in this concept, though, we thought we were on the right track. We just had to work on the details.

In August 1969 a high-level executive committee (referred to as the ExCom) consisting of David Packard as chairman, Dick Helms, and Dr. Lee DuBridge (science adviser to the president) approved the establishment of the structure, management, assets, personnel assignments, and intelligence objectives for a new organization that would be responsible for the submarine recovery.[18] Dr. Kissinger, the president's national security adviser, notified President Nixon of the new organization and its mission and secured his support for the operation. From that point on, the CIA's program to recover the *K-129* was managed under the auspices of the new organization whose name, activities, and even existence were very tightly controlled within the intelligence community. (This information is still considered to be very sensitive. The CIA redacted the name of the organization in its history, *Project AZORIAN,* released through FOIA channels in February 2010. Although other authors have speculated on the name and nature of this office [Richelson 2002, 195; Sontag and Drew 1998, 83; Polmar and White 2010, 59], that information is still classified.)

The support of the president and Dr. Kissinger was considered a pivotal moment for the program. There had been a lot of uncertainty about the president's reaction to the proposal. Nixon was somewhat of an enigma to DCI Richard Helms. Almost all communications between the two had been through an intermediary—either National Security Adviser Henry Kissinger or his military assistant, Colonel (later General) Al Haig. Nixon's dislike/distrust of the CIA was widely suspected throughout Washington. Reportedly, in the president's first postelection meeting with Henry Kissinger, Nixon had denounced the CIA as a group of "Ivy League liberals" who "had always opposed him politically."[19] The fact that Nixon was willing to endorse what had to be considered a high-risk espionage program against