

# 1 Narcissus

Honolulu, Hawaii, July 30, 2008

The summer sun was just creeping over the rim of the Diamond Head crater on the Hawaiian island of Oahu, lighting the crest of the ancient Ko'olau Mountain that provided the backdrop to Honolulu Harbor. Quickly and silently the banner of light descended, cascading down the Nu'uauu Valley in a shimmer of green, washing down and down over the rows of houses that shared the forested slope, illuminating the windows in little square reflections, until it bathed the land that fringed the island and flowed out over the sea, pricking the tops of the waves with light before plunging into its azure depths.

Commander Jack Becker, Office of Naval Intelligence, drove his military sedan through the dawn light along the shore of the west lock of Pearl Harbor and into the breaker's yard for the Pacific Mothball Fleet. He approached a metal building the size of an aircraft hangar, and could see that its two massive sliding doors at the end facing the harbor were closed. There seemed to be no activity, other than another sedan parked by an entry door on the side. Jack noticed that there were no windows in the building. Whatever activity that went on in there was meant to be secret.

Jack's reason for being here at dawn, so far as he knew, had nothing to do with his work. He had received an urgent message from a family friend, one Admiral Thomas J. Perkins, Deputy Commander in Chief and Chief of Staff, U.S. Pacific Command, who had asked for a clandestine meeting. The Admiral got out of the other car as he approached. Like Jack, he wore civilian clothes.

Jack got out and walked around the front of his sedan.

"Commander Becker," said the Admiral, and shook Jack's hand warmly. "It's good to see you, Jack."

Jack still imagined the Admiral as the big, authoritative man that his father had introduced him to almost twenty years ago. Seeing the Admiral now, he realized that he must be in his late fifties. His dark hair was streaked with gray, and he was thinner than he remembered, but the tanned skin of his forearms and face showed that he was still accustomed to being outside and part of the action. The dark eyes were still alert and bright, yet Jack could see the lines beginning to show on the Admiral's face, signs of age and wisdom, that Jack hadn't noticed before.

"Hello Admiral," said Jack. "It's good to see you, too."

"Did you get settled in?"

“Yes, I’m all set.” Jack would soon be starting his new assignment at the Joint Intelligence Operations Center, Pacific located at Camp Smith here at Pearl Harbor. He had taken three months leave to make the move from Washington, D.C. He had it coming to him, and then some. It had only taken a few days for him to find a comfortable house not far from the base. He planned to fly to Sydney to spend the rest of the time visiting with his mother and a few close friends before taking up his new post. That visit was long overdue.

“Good. How’s your mother, Jack?”

“She’s well. Looking forward to you and Martha living close by again.”

The Admiral nodded. He had recently been appointed as military attaché to the Government of Australia. “How’s her law practice going?” said the Admiral.

“Very well, as far as I can tell. She seems to be kept busy with a lot of international work with the different embassies.”

“Emily is a brilliant woman. Do you think she’ll ever come back to D.C.?”

“And very determined,” Jack added with a smile. “I can’t say what she might do.”

“No, I guess not.”

“And Martha? How is your lovely wife taking to the idea of you becoming even more of a bureaucrat?”

“She says at least I’ll be home for dinner more often.” He laughed. “Little does she know!” The Admiral held Jack’s gaze for a moment before continuing. “You’re probably wondering what I wanted to talk to you about.”

“It did peak my interest, yes,” said Jack. “Your message said it was urgent.”

“It’s probably easier to show you than tell you. Let’s go inside.” The Admiral turned toward the door and Jack followed.

Once inside, Jack stopped in his tracks. The scene was surreal. The building was empty, except for a fully rigged sailing yacht that was resting in a cradle in the middle of the vast, open space, with the keel just clear of the ground. There were no lights other than a bank of spotlights high overhead that were focused to illuminate the yacht in a bright pool of light. Scaffolding surrounded the stern, and visible intermittently amidst a billowing white cloud were two men in bulky, silver-colored protective suits and matching hoods with bright orange glass lenses. One of the men held what looked like an acetylene torch, but instead of producing a flame, the tool emitted some kind of gas in a shrill hissing sound. The white cloud appeared to emanate from there and dissipate about twenty feet away.

As Jack watched, the hissing of gas stopped and the cloud quickly dispersed. He turned to speak to the Admiral, but as he did the man holding the torch lowered it and the other applied a power tool to the hull. It whirred to life with a loud scraping sound too loud to talk over. Jack looked questioningly at the Admiral who stood quietly, his hands behind his back. It took perhaps three or four minutes for the procedure to be completed, and when it was done the two space-suited individuals worked together with tools to install some kind of fitting.

During this time, Jack had a chance to observe the design of the vessel. It had a sleek white, dish-shaped hull about seventy feet long that flared outward slightly at the top where it met the deck. It had a reverse transom that sloped from the waterline back up toward the cockpit, much like an around-the-world ocean racer. A row of six port lights set into heavy metal frames studded the side of the hull.

At the bottom of the narrow keel there was attached a pair of short, hydro-dynamically-shaped wings that sloped down about fifteen degrees from the horizontal. The yacht was sloop rigged, and the single mast rose at least ninety feet above the deck. The cockpit was positioned just behind the mast instead of further back near the stern, as was the case in smaller, inshore yachts. Jack knew that this layout provided better comfort and control for the helmsman and crew. A low cabin with sloping sides and more port lights sat forward of the cockpit, and behind it, above where the master's cabin would be, was a small aft deck carrying a dinghy and a hard-shelled inflatable life raft.

When the machinery stopped, the Admiral said, "The boys at the Lighthouse put this yacht together as kind of a going away present."

The "Lighthouse" was a colloquial term referring to the Naval Research Laboratory in Washington, D.C. Opened in 1923 at the suggestion of Thomas Edison, over time the lab had contributed to the defense community in many ways, such as proposing the first nuclear submarine and providing the systems design for the global positioning system.

The Admiral added, "But the team here at Pearl actually made the thing work."

"This is quite a present," said Jack.

"I had a plan to take a page out of your father's book, to take Martha and sail down to Australia from here."

The Admiral was referring to 1986. Jack's father, an American, had been in the diplomatic service. After ten years of challenging overseas postings, living in walled compounds, and traveling in armored cars, Jack's father had been determined to provide a more normal life for his wife and

young son. He had negotiated a job with the embassy in his wife's home town of Sydney, and then flown them to Hawaii where he had purchased a beautiful, forty-foot Sparkman and Stephens-designed offshore sailboat. They had taken six months to sail through some of the most pristine waters of the South Pacific en route to Australia. This had been Jack's introduction to sailing, and had instilled in him a lifelong love of the sea. Sadly, Jack's father had gone missing during a solo assignment to Srebrenica in 1995 while Jack was attending Sydney University. His mother had decided to stay in Sydney.

"I can recommend it," said Jack. "What's stopping you?"

"China."

"Really? How?" said Jack, turning to face him.

"It's this Tibet thing," the Admiral began. "China has just decided to have its Minister of National Defense attend the welcoming ceremony for heads of state at the Beijing Olympics."

The conflict between the Tibetans and China had erupted in violence, with television reports showing disturbing images of the beating and killing of Buddhist monks. A number of countries had spoken out against China's aggression. Some members of the United Nations had discussed openly the possibility of boycotting the Olympics in protest.

"It's just symbolic of course," said the Admiral, "to try and show that they're taking the international community's concerns about Tibet seriously."

Jack knew that China's Minister didn't have any real power; it was just a liaison office. But now all of the U.N. countries who were on the side of going ahead with the games would have to follow protocol and send a liaison themselves. It would be a bureaucratic nightmare to organize it all in time.

"Everybody's scrambling," confirmed the Admiral. "Of course, the State Department doesn't want to send the Secretary or Deputy Secretary because that would give the Chinese the message that what they're actually doing in Tibet is okay, but at the same time they want to encourage them to stay on the issue, so they have to send a lower level person."

"And that would be you," Jack filled in the blank.

"Got it in one," the Admiral confirmed. "I've just learned that I'm supposed to be at the opening ceremony and the delegates' meeting in less than two weeks—on the eighth of August. They've promised me that this will be my last official duty for the Navy. The only trouble is that I was planning for us to leave on the boat around the same time. After all the paperwork and briefings are done when I'm finished, I won't be back here until at least the end of August, and that will push

our departure too late into the hurricane season. Martha's already told me that she's not waiting around. She's going to fly down and start to get the house organized. That's why I need to ask you for a favor."

Jack considered all of this information. Tom and Martha were great friends of his parents, and had been a huge support for his mother when his father was lost. He didn't hesitate to offer his support for the Admiral now. "What can I do to help?" he said.

The Admiral straightened a little and looked him in the eye. "I'm asking you to take the boat down to Australia for me."

Jack raised his eyebrows and exhaled. "Don't get me wrong, Admiral. I want to help, but wouldn't it be easier for Defense or State to just ship it down for you? They owe you at least that much."

The Admiral grinned. "I thought you'd like to visit some of your old haunts."

Jack's father had cultivated Jack's interest in sailing by taking the family on an annual holiday cruise back to the South Pacific islands—the New Hebrides, Fiji, Tonga, or the Cook Islands—and Jack had continued these trips after his father's disappearance, during his school breaks, once with his mother, and then several times on his own. It helped him to keep the memory of his father alive.

"And it's a little more complicated than that," the Admiral added.

"Complicated how?"

"Let me show you."

The men had finished their work and removed their hoods to inspect the job. They were joined by a similarly-clad individual who had apparently been inside.

The Admiral motioned Jack to approach with him.

"Morning men!" he called.

The three stood to attention and saluted as best they could in their bulky garb.

"At ease. How's it going today?"

"Good, sir," replied the tool man. "We've got the new intake installed. All we need to do is clean up and we'll be finished."

The Admiral turned to Jack. "When we did the shake-down cruise we found that the cooling water intake for the engine was sometimes out of the water when we were heading upwind," he said. "We've put it down lower." They walked around to the stern. "She's a beauty, isn't she?"

"Yes, sir, she sure is," Jack said with admiration.

The beam of the yacht was about fourteen feet and imprinted proudly across the transom in capital letters was the yacht's name, "*IRONSIDES*."

"Admiral, does the Secretary of the Navy have any worries about the use of the name?" said Jack. He thought it unusual for the navy to use the nickname of an active naval vessel. The *U.S.S. Constitution* was the navy's historic three-masted heavy frigate, launched in 1797. It was the oldest commissioned naval vessel in the world still afloat.

"SECNAV doesn't know anything about it."

"Didn't it come out of appropriations?"

"No, it came out of the research budget," said the Admiral with a sidelong glance.

"Research?"

"That's what I wanted to show you." The Admiral walked over to the scaffolding where the men were finishing up. "Do you have that plug there?"

One of the men came down the stairs from the platform holding a metal box and opened it, like he was offering the Admiral a cigar. The Admiral removed the two-inch-diameter disc they had just cut out of the hull with the hole saw, holding the edges of it between his fingers like a coin, and raised it up for Jack's inspection.

"It has a modified composite carbon fiber and Kevlar skin," said the Admiral. He then turned it sideways, displaying the two layers, and in between a bluish, opaque material about three quarters of an inch thick. "Inside and out, with a special sandwich filling."

Jack furrowed his brow. "I don't understand, sir. What's so special about it? Lots of boats use a composite sandwich construction."

In response, the Admiral called up to the men on the platform again. "Have you got a screwdriver?"

"Yes, sir," replied another of them, who hurried down with it and then returned to his work.

"Watch closely," said the Admiral. Holding the disk in his left hand he gently pushed the blade of the screwdriver very slowly into the filling until it protruded from the other side.

Jack nodded. "So it's a gel."

The Admiral smiled. "Pull it out quickly," he instructed, turning the handle of the screwdriver toward him.

Jack pulled, but the screwdriver wouldn't budge.

"Now pull it very slowly."

He did so and the blade emerged, without any visible residue and without leaving a hole.

“The closest thing to human flesh that they could come up with,” said the Admiral. “I’m sure not a scientist, but that’s the best explanation I can give you. It’s self-healing. The way it was described to me is that it works like a seatbelt. Pull hard and it clamps down to resist you. Pull slowly and it gives you slack. It’s got something to do with some guy named Winslow.”

Jack’s head snapped up and he looked the Admiral squarely in the eye. “Admiral, this is ‘Narcissus.’” he said with surprise. “But this is still in the concept stage.”

“That’s why we’re fooling around out here in the tool shed instead of driving it around with a flag painted on it,” the Admiral replied with a broad smile.

Narcissus was the code name for a highly-classified research project that was trying to design a light, bullet-proof material. The concept was derived from an arcane branch of materials science called rheology pioneered by American scientist Willis Winslow in the 1940s. In layman’s terms, he studied how different fluids reacted in different conditions. The class of material that was now being tested had a long and complex name—high affinity, cross-linked, visco-elastic emulsion—but the nature of it was quite simple. In a stable condition, it was a gel, but when you tried to shear it quickly, say by piercing it using a knife or a bullet, it acted like a solid. A sandwich construction that could be made to contain the gel would be flexible at rest, but transform into an extremely rigid structural panel if put under stress. If a material could be found that satisfied these properties it might be able to be used for body armor, shells of personnel carriers, fuselages of aircraft, or even hulls of warships, as well as a host of civilian applications in the future.

The name Narcissus was chosen because, like the character in Greek mythology, it was only attracted to itself. That was the “high affinity” part. If the material was ever compromised, the surrounding material was supposed to be able to flow together to “heal” itself, like the human body heals a wound, but wouldn’t adhere to anything else. As far as Jack knew, the research work at the Naval Research Laboratory was known to only a few people in the intelligence community, and hadn’t advanced to the “grey project” stage.

“This is supposed to be classified, sir,” Jack said, looking at the man holding the box and to the two others observing from the platform.

“Well, call this the proof of concept,” the Admiral said. “And don’t worry about these men. They’re used to taking apart big, secret things here.” He swept his free hand around to signify the enormous space inside the building. “That’s what they do for a living.”

“But Admiral, this is like strapping a Saturn rocket onto a 747 full of passengers to see if it will improve the flight time between Singapore and New York,” Jack protested. “This is still experimental.”

“Maybe, but times are tough. Iraq is bleeding the treasury dry. The government is telling all of the departments to be creative. Do more with less. Encourage lateral thinking. Before the Department of Defense can ask for more resources to develop a military application for this goo, they have to have a working concept. This is cheap,” he gestured to the yacht, “compared to mocking up a destroyer.” The Admiral paused and turned to face him. “You see, Jack, it’s not about Martha and me sailing to Australia. It’s about the boat making the trip and showing that it will work. I have confidence in this technology. I’d bet my life on it. This is extremely important to the defense of our country.” He placed the plug back into the box and the sailor retreated to rejoin the other sailors. The Admiral grinned. “The boys at the Lighthouse don’t want us to lose any of it,” he said.

The Admiral took Jack by the shoulder and steered him toward the steps of the scaffolding. “What these clever men had to figure out was how to drill holes in the stuff,” he said. “It turns out that if you cool it with liquid nitrogen down to minus fifty degrees Celsius it gets hard enough to cut, but only with diamond blades.” He started up the steps. “Let me show you around.”

From the deck, it looked to Jack like any other luxury yacht, with some modifications for sailing alone or with a small crew. He could see that all of the lines used to control the sails were placed for easy access from the helm.

“The mast is some kind of carbon fiber as well,” said the Admiral as he started down the companionway into the main saloon.

Jack followed. The interior was fitted out to be bright and practical, not luxurious, so there were no varnished wood finishes or crystal chandeliers, but at the same time it was a comfortable layout.

“Who designed it?” Jack asked when they were out of earshot of the other men. He looked around, taking in the interior features.

“The guys in D.C. I think they based it on some current designs, but then broke some rules to spice it up quite a bit. It’s the fastest yacht in its class. They spent quite a while testing the scale model in the tanks at the lab. For them it was like being let out to play in the sandbox. Some of them are sailors themselves, and they just couldn’t wait to put some of their ideas to work.”

“How long have you had it?” asked Jack, poking his head into one of the forward staterooms.



“About six months. Every system and every feature has been tested and re-tested in some pretty demanding conditions. That cooling water problem,” he said, jerking his thumb over his shoulder, “showed up a while ago when we were trying to sink her out in the channel off Koko Head.” He smiled at the memory and shook his head. “Just couldn’t do it. The winged keel and water ballast really improve the stability. One more thing: that gel is lighter than water. Trying to sink this boat is like trying to sink a foam beer cooler.”

Jack was impressed with what he saw. The yacht’s technical systems were cutting edge and the interior had been well thought out, with ample head room for his six-foot two-inch frame. He walked through the passage to the owner’s quarters in the stern, behind the cockpit. It was fitted with a double bunk, plenty of stowage for clothing and books, with its own head and shower and small tub. Part of the bunk and some of the finishes had been dismantled to accommodate today’s work, but the cabin, and indeed the rest of the yacht, appeared to be equipped—even provisioned—and ready to go. Jack remarked on the state of readiness.

“Remember, that’s our job,” said the Admiral. “Ready to go at a moment’s notice.”

“What day were you planning to leave?”

“In ten days. ETD was Saturday the ninth of August at 0900.”

“I’ll need a single sideband radio.”

The Admiral grinned again, this time, Jack thought, with a great deal of pride and satisfaction. “We can arrange that.”

“Good. Then let’s not keep the boys at the Lighthouse waiting any longer.”