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Reports

Authorities Question Criteria for Access To Flight Simulators

By Josey Ballenger

WASHINGTON, September 25, 2001 — Congress and the executive branch are reviewing the largely unregulated access to the nations 527 licensed flight simulators, and to the unknown number sold abroad, in the wake of the Sept. 11 terrorist attacks.

High-end simulators are million-dollar "virtual reality" machines that recreate the sights, sounds and sensations of the cockpit, with the knobs and levers accurately laid out in 3-D. Professional pilots say they often come out sweating after an intense session.

Federal authorities have established that at least nine of the 19 suicide hijackers attended U.S. flight schools, and that at least three - Mohamed Atta, Marwan Al-Shehhi and Hani Hanjour - also rented flight time at simulator centers across the country.

Aviation experts say these men could have practiced crashing into the World Trade Center and other landmarks without detection.

Federal Aviation Administration officials are already discussing imposing tighter restrictions on who can use these simulators and requiring special licensing for manufacturers to export the machines.

In the U.S. House of Representatives, the aviation subcommittee of the Transportation and Infrastructure Committee is holding the second of two days of hearings on airline safety Sept. 25. In the Senate, the Commerce, Science and Transportation Committee and the Appropriations Committees transportation subcommittee held hearings on the same subject Sept. 20.

The FAA is required to inspect and approve all simulators used to instruct U.S. pilots, and a handful are FAA-certified through special arrangement with the State Department to help foreign governments, such as China's, that lack such a regulatory body.

However, no U.S. government agency monitors how many, or where, other non-military flight simulators have been exported in instances where they are not used to train U.S. pilots or where there is no government-to-government arrangement. Before Sept. 11, civil aircraft were not considered to be weapons, so civil-aircraft simulators didnt qualify under the "dual-use" criterion that requires extra regulation by the Commerce Department.

FAA officials and congressional staff members now say that Commerce might add civil-aircraft simulators to the list of commodities controlled under the Export Administration Act. The State Department already monitors exports of military-aircraft simulators.

Moves to tighten security are also afoot in Florida, which trains 20 percent of the worlds pilots, has more than 220 flight schools and where investigators have tied some of the suspected terrorists to flight schools and "sim" centers.

Republican Gov. Jeb Bush told reporters that it is "appropriate to look at the levels of regulation for these flight schools." Florida Department of Transportation officials say state Rep. Stacy Ritter, a Democrat from Coral Springs, is already drafting a bill to require schools to conduct background checks in coordination
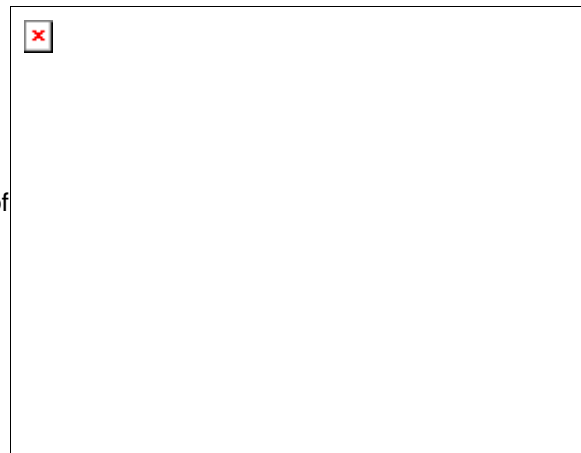
with the FBI, the state Department of Law Enforcement and the U.S. Immigration and Naturalization Service.

More than 500 FAA-certified simulators

The Federal Aviation Administration has approved 527 simulators that are in active use. They are operated by 47 airlines and flight schools at 86 locations across the United States and at 19 abroad; some of those locations could be shared among different operators. Of those 527 simulators, 21 are actively used Boeing 757s, and 24 are active Boeing 767s - the types of commercial aircraft used in the Sept. 11 terrorist attacks.

The North American locations stretch from Calgary, Vancouver and Toronto in Canada to Atlanta, Dallas-Fort Worth, Miami, Wichita, Kan., and Wilmington, Del., in the United States.

The flight schools and airlines overseas with FAA-approved devices are in Amsterdam, Beijing, Berlin, Helsinki, London, Luxembourg, Paris, Singapore and Palma de Mallorca, Spain.

Possible that terrorists practiced crashing on simulators

Advanced simulators run visual software that allows pilots to practice landing at various airports, here and abroad. To give the pilot real-life cues, the runways' environs - cityscapes and natural features such as waterways - are depicted by a field of white dots. The pilot can go off-course and fly around landmarks such as the Washington Monument, the Gateway Arch in St. Louis or the Empire State Building.

In the simulator, a pilot can practice taking off from New Yorks JFK Airport, turn left until heading due west, and see the skyline of Manhattan. "What you see in the box would be what you'd see in a night scene - the World Trade Center was, in fact, simulated," said Sam Woolsey, a retired United and PanAm captain living in California.

"It's an absolute possibility that (the terrorists) went out and rented a simulator and practiced running into the World Trade Center. What we used to do when we had a couple of spare minutes in our training session, we'd aim the airplane between the towers, or under the Golden Gate Bridge," the former commercial pilot said. "San Francisco, London, L.A. and Hong Kong - they're all replicated."

And the pilot can create different weather conditions - rain, fog, snow, high winds and turbulence - in a six-axis, hydraulic machine that twists and turns. The pilot can call up a daytime sky, or nightfall.

The leading manufacturers of simulators - which cost from $1 million to $10 million - are CAE of Saint-Laurent, Qubec, and New York-based FlightSafety International, which also operates the largest network of flight schools in the world. Thales Training and Simulation (formerly Thomson-CSF), headquartered in Crawley, England, is another big manufacturer. Other simulators in the FAAs database were made by the now-defunct U.S. companies Singer-Link, Redifusion and Conductron.

  No hard-drive memories

The consoles of flight simulators dont have the same hard-drive memories as desktop computers, so investigators may never know whether the hijackers practiced crashing into the World Trade Center or other landmarks. FAA officials say some airlines and flight schools set up video cameras inside simulators in order to record sessions for training purposes. But so far, no incriminating tapes have surfaced.

"In many of the modern simulators, there is the ability to record part of the flight and play it back - but once the machine is turned off, its gone. It *could* be recorded at the console, but I havent heard of it," said Ed Cook, acting manager of the FAA National Simulator Program Office in Atlanta.

"Certain facilities have a camera inside the simulator, and there are ways to store (on the hard drive), but nobody does it because it takes too much space," added an FAA engineer in the simulator program. "There is no way to figure out if someone did that. Its not like e-mail," where technicians can retrieve so-called deleted material on a hard drive even months after a user's intended removal.

However, according to news reports, FBI agents have interviewed dozens of people at flight schools and "sim" centers and established that at least nine of the suspects had attended aviation classes, had experience flying small planes, or both. Some also trained on 727 and 747 simulators.

Atta and Al-Shehhi - who were on the two United and American jets that struck the World Trade Center - reportedly each paid $10,000 for flying lessons at Huffman Aviation International in Venice, Fla., then $1,500 in cash for six hours in December at SimCenter Inc. at Opa-locka Airport in the southern part of the state.

And Hanjour, who was on the American Airlines flight that crashed into the Pentagon, reportedly trained at two schools in Arizona - the CRM Airline Training Center in Scottsdale in 1996 and 1997 and, in June, at the Sawyer School of Aviation in Phoenix.

No background checks Aviation experts say anyone can book simulation time, provided he or she has the cash and the experience, which is often unverified. They point out that aside from flight schools and private "sim" centers stationed at many U.S. airports, the hijackers might have gained access to the machines directly through an airline, if employed by one, or by buying sessions from an airline contracting out excess time. Another possibility is that the hijackers gained access through a wealthy owner, domestically or overseas, who purchased a simulator for private use. However, no person interviewed for this report knew of such a case.

"Pilots can take their training anywhere; all it takes is money," said Capt. Hal McNicol, who runs Flight Crews International, Inc., a pilot placement agency based at Los Angeles International Airport. Someone trained in Europe or the Middle East to fly a Boeing 737, for example, could transfer to another flight school or airline and upgrade his or her skills to a 757 or 767 on a simulator.

McNicol, a former Navy, commercial and private pilot, said flight schools and airlines ask unfamiliar pilots who book simulation time about their aviation experience. In theory, they require basic pilot and instrumentation licenses, which take a combined 300 hours worth of training. But they don't necessarily check certification. "Their obligation is to train the pilot," he said.

But that - like many other security measures the executive branch and Congress will be scrutinizing in the next few months - might change.
"For contract training, my understanding is that they haven't done extensive background checks up until now," said Archie Dillard, the FAA's national resource specialist for simulation engineering. "I expect that will change, like getting prior approval before they can enroll from some kind of authority like the FAA, or the INS, if they are a foreign national."
Minimal experience necessary What's more, experienced pilots say the hijackers who crashed Sept. 11 into the two powerful symbols needed only minimal aviation experience. The hijackers did not need to take off or land the aircraft, since they took over in mid-air. All they needed was a few hundred hours worth of basic training to keep the plane level. They could reprogram it to crash into a target.

"It doesn't take that much skill; just enough knowledge to home in on a radio station in New York or Washington, and the needle (zeroes) right in," said McNicol, referring to the automatic direction finder that steers an aircraft. "You don't have to know anything about flying, other than the wings have to be level to fly straight." McNicol noted that the suspects, some of whom attended flight schools in Florida and Arizona, "probably got all the information they needed [there]." "Anybody can buy manuals for these airplanes and learn how to do navigation," he added. "Anybody can buy an aeronautical map."

Indeed, federal investigators found that several of the 19 suspects had acquired flight training textbooks in English and Arabic, instructional videos and air traffic maps.

A pilot with only a couple of hundred hours experience could have pulled off the operation, concurred Richard Theokas, chairman of the flight training department at Embry-Riddle Aeronautical University in Daytona Beach, Fla. "You just need to know how to fly straight and level and keep on target," Theokas said. "These guys allowed others to take off, and they didn't have to land it."

The FBI has identified Embry-Riddle, along with FlightSafety Academy in Vero Beach, Fla., as possible training grounds for some of the suspects, although the use of fake and duplicate names has caused uncertainty. Authorities have established that the novice pilots got experience at other flight schools and simulator centers, such as the Palm Beach Flight School in Lantana and Jones Aviation at the Sarasota-Bradenton International Airport.

The FBI has also detained, for the second time, a French-Moroccan man named Habib Zacarias Musawi (also spelled Moussaoui), who first raised suspicion Aug. 17 when he sought simulator training for a 747 in Minnesota. Instructors at the Pan Am Flight School there were suspicious when Musawi offered several thousand dollars in cash and was not interested in takeoffs and landings, only in steering or flying in a horizontal position. The FBI discovered that he had earlier trained at another school in Norman, Okla.

According to several news reports, French intelligence informed the FBI in August that Musawi had traveled several times to Afghanistan, the home of Osama bin Laden, the leading suspect in the Sept. 11 suicide attacks. Bin Laden, a millionaire Saudi Arabian exile also indicted by the U.S. for the 1998 bombing of American Embassies in Kenya and Tanzania, runs an international terrorist organization called al-Qaida, meaning "the base." Musawi's behavior "should have been a very large warning flag, if that information had been put together in Washington," Vince Cannistraro, former executive director of the CIAs counterterrorism center, told ABC News. In an interview with *The Public i*, Cannistraro said that the FBI in Minnesota did not send the information on Musawi to headquarters.

Game producers erase sensitive references Regular PC users can also "fly" over New York and other cities on high-tech flight games available for as little as $40. But when a player makes a mistake, the program shows a crash without necessarily depicting objects blowing up. And there is no sensation of motion, as with a rotating, six-axis simulator. Nor does a keyboard or joystick mimic a cockpit dashboard.

Nonetheless, U.S. software makers are scurrying to remove all references to sensitive material. And within days of the terrorist attacks, British retailers Virgin Megastores and Woolworths removed "Flight Simulator 2000" from shelves. Woolworths also pulled PlayStation2s "City Crisis," another desktop game. So far, no U.S. chain has made a similar move, though some individual stores reportedly have.

"I can tell you as a (private) pilot that there is a huge distinction between real-world flight training and a desktop application," said Matt Pilla, a spokesman for Microsoft, which publishes the popular "Flight Simulator" series. "Its a fun game, but its very difficult to reproduce the sensory experience of real-life flight training. It's not how you learn to fly." But out of respect for the victims and the public, Pilla said Microsoft technicians are working on a "patch" that users will be able to download free to remove images of the World Trade Center on the current version. He estimated that the patch would be ready on the companys Web site by the end of September. And the upcoming version, "Flight Simulator 2002," originally due to arrive in shops this fall but now delayed, will not include the trade center.

Electronic Arts, another U.S. manufacturer, suspended for a week it's hit online game "Majestic," which uses Web sites, phone calls, e-mail and other electronic means for players to gather clues. Electronic Arts is also sanitizing future packaging for its retail games "Command & Conquer Red Alert 2" and "Yuris Revenge Expansion Pack," which depict U.S. monuments amidst a hypothetical war.

Another company, Scottsdale, Ariz.-based ARUSH Entertainment, rushed to remove images of a character battling his way around lower Manhattan. Yet another game maker, Ubi Soft Entertainment of San Francisco, is delaying the release, originally slated for Oct. 9, of a new Tom Clancy game, "Rogue Spear: Black Thorn" - in which players fight terrorists and rescue hostages - although its content reportedly will not be altered.

Doug Lowenstein, president of the Interactive Digital Software Association, which represents 90 percent of the entertainment software industry, might have put it best: "What was acceptable on Sept. 10 may not be acceptable ever again," he told reporters. "Everything has changed for everyone and every business in this country."

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