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Cockpit Image Recorders: A Picture Is Worth a Thousand Words

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Everywhere we go our moves are randomly recorded, but suggest a video camera be placed in the cockpit of an aircraft, a pilot's workplace, and watch out! The pilot unions immediately switch off the auto-pilot and begin complaining how this would be a clear and abominable violation of their members' privacy rights. Do bankers, gas station attendants, convenience store clerks, jailers, blackjack dealers and doormen complain about cameras in their workplaces? Would we listen if they did?

For the last four years, the U.S. National Transportation Safety Board's (NTSB) goal of putting video cameras in the cockpits of large commercial jets has been frustrated, in large part, by the efforts of the major pilot unions. This article will review the efforts by the NTSB and others to require video cameras in the cockpits of large transport category aircraft, discuss the arguments for and against this proposal, and conclude the time has come for the Federal Aviation Administration (FAA) to put safety first and follow the NTSB's five-year-old recommendation that it mandate video cameras in the cockpit.

Cockpit Video Image Recorders Are Now on the NTSB's "Most Wanted" List

The NTSB, an independent Federal agency, is charged by Congress with investigating every civil aviation accident in the United States.¹ The NTSB's primary function is to promote safety

in transportation.² Since inception, the NTSB has investigated more than 124,000 aviation accidents. During an investigation, the NTSB is responsible for the determination of facts, conditions and circumstances, and the probable causes of civil aircraft accidents. The NTSB then "makes transportation safety recommendations to Federal, State, and local agencies and private organizations to reduce the likelihood of recurrences of transportation accidents."³

In 1990, the NTSB first cited the need for video recording of the cockpit environment.⁴ At that time, the Board stated it would "monitor and evaluate progress in the application of video technology to the cockpits of air transports."⁵ On April 11, 2000, NTSB Chairman James Hall sent a nine-page safety recommendation letter to FAA Administrator Jane Garvey urging that commercial airliners subject to cockpit voice and data recorder requirements be retrofitted with a "crash protected video image recording system" by January 1, 2005; and that all such aircraft manufactured new after January 1, 2003, contain two such systems. Chairman Hall explained to the FAA that, in the nine years since the NTSB first cited the need for cockpit video image recorders:

Considerable progress has been made in video and flight recorder technologies, and the need for video recording has become more evident. Electronic image recording of the cockpit environment is now both technologically and economically feasible.⁶

After the FAA failed to issue a timely technical standard order concerning video cameras in the cockpit, the NTSB in 2002 added this aviation goal to its "Most Wanted" list: "Install video recorders in cockpits to give investigators more information to solve complex accidents."⁷ On its "Most Wanted" list, the NTSB identifies "critical changes needed to reduce transportation accidents and save lives."⁸

In continuing efforts, the NTSB has conducted several symposia where individuals from the aviation industry, unions, and government have made presentations pertaining to the issue of cockpit image recorders.⁹ Taking its efforts up a notch, on July 27-28, 2004, the agency convened a public meeting at its Washington, D.C., office to discuss *Aviation Image Recording*. At this meeting, a senior NTSB investigator, Frank Hilldrup, testified as the first witness. After describing the history of the NTSB's efforts to obtain video cameras in cockpits he concluded: "I believe it is clear that cockpit image recorders would greatly enhance investigators' ability

to more precisely and quickly determine the circumstances of aviation accidents and incidents.”¹⁰

The second witness to testify at the public meeting last July was Ken Smart, who heads the United Kingdom’s equivalent of the NTSB, the Air Accidents Investigation Branch. Mr. Smart has been one of the world’s leading proponents of video cameras in cockpits, working actively on the issue for approximately twenty years:

Finally, my—my thoughts are that if our industry is serious about our intention, our declared intention, to more fully understand the human performance issues associated with accidents as a means of reducing accidents in the future and enhancing public safety, then my view is that cockpit image recording is an essential part of achieving that aim. It will provide a missing link in the information chain that helps our understanding of these accidents, and it will provide essential evidence in those thankfully few cases where we—accident investigation organizations around the world really struggle to understand the cause of the accidents that fall into that particular category. But having said that, image recorders will also provide essential information on almost all the accidents that we investigate insofar as they provide additional information. I would not—I would not suggest that they should ever replace cockpit voice recording or flight data recording. They’re complementary methods of recording. They’re not mutually exclusive—they’re not substitutes for either recording.¹¹

The Pilot Unions Strenuously Object to Cockpit Image Recorders

In its August 2004 issue of *Pilot Perspective*¹² the Allied Pilots Association (APA) provided its members with “talking points” to inform them how to respond when asked about cockpit video imaging. The APA’s “primary message” was:

APA is strongly opposed to cockpit imaging recorders because the benefits of video imaging are vastly overrated and because far more effective and efficient tools exist that will not only obtain the safety data necessary to accurately investigate an accident but also help to prevent future accidents.

In the same publication the APA also identified six “secondary messages” for its members to use as “talking points” in the public debate:

- Experts are clear that the imagery information gathered from cockpit image recorders is unlikely to provide the detailed data that proponents promise or that is vital to any accurate air carrier accident investigation.
- Digital flight data recorder information is unambiguous and not subject to analytical shortcomings associated with video. The NTSB has already recommended expanding the digital flight data recorder information available.
- Cockpit imaging recorders could lead investigators to draw flawed and premature conclusions or to curtail a thorough assessment of all factors in an accident.
- The nation’s leading experts ranked critical actions that could further enhance commercial aviation safety and cockpit video didn’t make the list.
- History has shown that in the current environment it is impossible to safeguard the privacy of cockpit voice recorders, much less cockpit image recorders. When cockpit voice recorders were originally installed, it was done with clear guarantees about pilot privacy. Those guarantees are no longer in place. Given the significant technological concerns that exist, we do not believe that the costs and pilot privacy issues are outweighed by any purported benefits.
- Accident prevention is more cost effective than accident investigation. Given the financial challenges facing the industry today, we need to focus our resources where they will make the greatest difference.

The Air Line Pilots Association (ALPA), the largest and oldest airline pilot union in the world, representing 64,000 pilots, likewise is opposed to any use of video recording in the cockpit. Its advocacy is remarkably similar to the APA’s “talking points.” According to ALPA, “CIR (cockpit image recorders) provide no significant additional benefits, while inflicting a far greater invasion of privacy than CVR [cockpit voice recorder] recordings.” ALPA elaborates:

Current technology already provides investigators with the tools they need to determine the causes of airline accidents. . . . Video imaging would add virtually nothing

of real value to the investigative process, and could, due to its subjective nature, actually lead investigators down the wrong path.

Contrary to popular opinion, compared to the precise data provided by the DFDR and forensic evidence, video imaging is an imprecise form of information. If an image shows a pilot's hand moving toward a switch or moving his or her leg, that does not prove that he/she activated that switch or made an input to the rudder, whereas the DFDR will show the exact state of each switch, the exact amount of rudder input. Given the proper sensors, the DFDR can even distinguish between the pilot pushing on the pedal and the pedal pushing on the pilot—a distinction impossible to determine with video.¹³

The Pilot Unions' Objections Should Be Overruled

The primary argument against mandating cockpit video image recorders for air transport aircraft is the claim that the information these cameras would provide would be of little or no value. While the APA makes this point by arguing the benefit of video recorders is "overrated;" ALPA goes even further, alleging "video imaging would add virtually nothing of real value to the investigative process." These contentions fall apart on careful inspection.

The "aviation experts" relied on by the pilot associations seem mostly to be their own members or close affiliates, whose opinions on the value of video cameras in cockpits differ from most of the unbiased aviation experts, including individuals with major responsibilities at the NTSB and similar organizations in other countries. In explaining why cockpit video image recorders are on its *Most Wanted List* the NTSB recently explained:

The Safety Board asked for the installation of cockpit image recorders in large transport aircraft to provide information that would supplement existing CVR and FDR data in accident investigations. This kind of additional information would have been extremely valuable in a number of important accident investigations, including ValuJet 592 near Miami, Silk Air 185 in Indonesia, Swissair 111 near Peggy's Cove, Nova Scotia, and EgyptAir 990.¹⁴

The NTSB described the perceived value of cockpit video imaging reporting in more detail when it initiated its safety recommendation in April of 2000. After setting forth the facts and investigation circumstances for the ValuJet, SilkAir, Swissair, and EgyptAir disaster cases the Board explained:

These accidents are just the most recent in a long history of accident and incident investigations that might have benefited from the capture of a graphic record of the cockpit environment. Reconstructing the events that led to many accidents has been difficult for investigators because of limited data. This lack of information was evident during the ValuJet investigation. Although the conventional CVR and DFDR recorded sounds and relatively comprehensive airplane data at the time of the initial fire, they did not show the cockpit environmental conditions that the flight crew faced during the initial portion of the fire. This information is critical in determining whether the crew had subtle indications of smoke or fire, whether they followed procedures, or whether or not their actions were effective in clearing smoke from the cockpit. If the conditions were known, it might be possible to modify aircraft systems or training programs to assist future crews in recognizing these indications and effecting a safe recovery.

The Swissair MD-11 accident was very similar to the ValuJet accident, except the fire is not believed to have progressed as quickly, giving the crew more time to attempt to effect a safe recovery. However, the lack of cockpit imagery has resulted in many unanswered questions about the origin of the fire, the first indications of a fire in the cockpit, the procedures used, and the effectiveness of the procedures in clearing smoke from the cockpit. Questions also remain regarding the progression of the fire, the availability of critical flight instruments, and whether the crew was overcome or debilitated by the smoke and fire during the final minutes of the flight.

The Safety Board's current investigation of the crash of EgyptAir flight 990, a Boeing 767 aircraft, further highlights the need for electronic cockpit imagery on commercial transport aircraft. Even though the aircraft was

equipped with a 30-minute CVR and a DFDR that sampled over 150 parameters, the Safety Board is concerned that the full circumstances that led to the descent into the ocean may never be fully understood because of the lack of electronic cockpit imagery. The data appear to indicate that the flight was proceeding normally at about 33,000 feet until the autopilot disconnected. About 8 seconds later, a large nose-down elevator deflection and reduction of power to both engines were recorded, and the airplane began a rapid descent. During this descent, the airplane reached a maximum nose-down pitch angle of about 40°. The last few seconds of the data recorder showed that the pitch attitude of the aircraft rose to about 10° nose down. It also showed an elevator split in the last 15 seconds, during which the No. 1 elevator (left, or captain's side) was in the nose-up position, while the No. 2 elevator (right, first officer's side) was in the nose-down position. The maximum split between the elevators during that period was about 7°. In the last second of data, the elevator split appeared to be lessening. DFDR parameters 'engine start lever,' both left and right, changed from 'run' to 'cut-off.' The changes in these and other engine parameters are consistent with both engines shutting down. Also, the speed brake handle moved from the stowed position to the deployed position. The origins of the actions, as well as the circumstances prompting the actions, that resulted in the changes in the aircraft's controls may never be definitively resolved because of the lack of electronic images of the cockpit. The Safety Board continues to actively gather more information in an attempt to answer the unresolved questions, but the Board does not have any direct evidence of these actions in the cockpit.¹⁵

In the EgyptAir case, it appears likely the relief co-pilot intentionally crashed the plane while the captain tried to stop him, although the Egyptian government and others persist in arguing that is not what happened. The uproar over what happened interfered with any real investigation of why the relief co-pilot may have intentionally crashed the plane. Given the events of September 11, 2001, in retrospect, there is no telling what important intelligence advances may have been possible if a cockpit video recording definitively showed what happened in the cockpit, and Egypt, instead of denying that the co-pilot intentionally crashed the air-

craft, focused on what might have been behind their co-pilot's actions. A terrorist connection to the crash has never been ruled out.

At the public hearing last July, the NTSB presented a strong technical case supporting its view that cockpit image recordings would have great value. One expert described the benefit argument advanced by the Board as "unanswerable."¹⁶ Another observed:

Now we arrive at the need for image recording systems. The desire for cockpit image recordings to assist in post-accident investigations has been well known within our industry for many years. Now, with the convergence of several enabling technologies, cost effective commercial image recorders are possible.¹⁷

No one is arguing any currently available information should be traded in order to obtain video evidence of what happened in the cockpit of an aircraft before a crash. The role and importance of cockpit voice and flight data recorders is established. Nothing about mandating cockpit voice cameras will diminish the importance of cockpit voice recorders or flight data recorders.

The objection that video evidence would likely be valueless also defies common sense. More information will be available with video imaging than without it. It is a non sequitur to suggest additional information to evaluate air disasters would be valueless, especially when the world's lead investigating agency has documented the need for this information through retrospective analysis of a number of major air crash cases.

The secondary points relied on by the pilot associations to oppose cameras in the cockpit are as or more flawed than their primary message. Contrary to the associations' contentions:

- The unbiased experts have reaffirmed their long held conviction that the imagery information gathered from cockpit image recorders will provide valuable data that will be important in most air carrier accident investigations.
- While digital flight data recorder information is unambiguous and not subject to analytical shortcomings associated with video, this fact does not alter the value of additional video information to help answer questions flight data recorders cannot address.
- There is no evidence cockpit imaging recorders could lead investigators to draw flawed and premature conclusions, or to curtail a thorough assessment of all factors in an

accident. It is hard to imagine how more information after a crash would lead to a less reliable investigation result.

- The contention that the "nation's leading experts ranked critical actions that could further enhance commercial aviation safety and cockpit video didn't make the list" is belied by the fact that cockpit video imaging is a major goal of the NTSB and similar organizations and is one of a handful of recommendations on the NTSB's "Most Wanted" list.
- History has not shown that in the current environment it is impossible to safeguard the privacy of cockpit voice recorders. The system of statutory and court protection has resulted in rare instances of improper public disclosure of private information.
- In answer to the half-hearted argument that, "given the financial challenges facing the industry today, we need to focus our resources where they will make the greatest difference," it must be remembered that the cost of cameras in the cockpit is projected to be fairly nominal in the context of aircraft operations, accounting for a tiny fraction of an aircraft's projected revenues at \$1,500 to \$10,000 per aircraft, according to experts who testified at the NTSB public meeting.

Mr. Smart was asked an important question at the NTSB's public meeting on cockpit video recorders last July:

DR. BYRNE: Just one, Mr. Smart. You've—you've discussed many benefits today about this technology, image recording. As an accident investigator, what negatives exist, or limitations exist, with the use of this technology?

MR. SMART: The down side of recording is nearly always in—outside the direct evidence, it's—it's the issues that are—that concern the Allied Pilots Association. It's the misuse of this information when it's available. I—I fully understand their concerns, and I'd mirror Frank Hilldrup's words at the end of his presentation where he said that we need to address that aspect of it in terms of legislation. I guess this is one of the things we're going to be considering tomorrow. Other than that, as I sit here, I can't think of too many issues on the down side, apart

from the normal factors that beset us in an investigation in that, you know, the camera angle that we really wanted was obscured for some reason or another, that side of things. But the—the positive aspects of image recording will vastly outweigh anything negative in that sense.¹⁸

The Privacy Solution

Privacy is a legitimate but manageable issue. The same statutory structure used to protect the privacy rights of pilots in relation to the release of cockpit voice recorder transcripts and recordings can be implemented in respect to cockpit image recorders. The United States Congress has passed two statutes that relate to access to cockpit voice recorder information. 49 U.S.C.S. §§ 1114, 1154 (2004), and 49 U.S.C.S. § 1154 (2004). Section 1114 governs release of information by the National Transportation Safety NTSB. As relevant, this statute states:

c) Cockpit recordings and transcripts.

(1) The NTSB may not disclose publicly any part of a cockpit voice or video recorder recording or transcript of oral communications by and between flight crew members and ground stations related to an accident or incident investigated by the NTSB. However, the NTSB shall make public any part of a transcript or any written depiction of visual information the NTSB decides is relevant to the accident or incident— . . .

Section 1154 governs the procedures for private litigants obtaining voice recorder tapes and transcripts. According to this statute, "a court may allow discovery by a party of a cockpit . . . recorder transcript if, after an in-camera review of the transcript, the court decides that (i) the part of the transcript made available to the public under § 1114(c) or 1114(d) of this Title does not provide the party with sufficient information for the party to receive a fair trial and (ii) discovery of additional parts of the transcript is necessary to provide the party with sufficient information for the party to receive a fair trial." Subsection (a)(3) states that "a court may allow discovery by a party of a cockpit . . . recorder recording if, after an in-camera review of the recording, the court decides that—(a) the parts of the transcript made available to the public . . . and through discovery . . . [of additional sections of the transcript] do not provide the party with sufficient information

for the party to receive a fair trial; and (b) discovery of the cockpit . . . recorder recording is necessary to provide the party with sufficient information for the party to receive a fair trial.”¹⁹

When access to the transcript or recording is allowed under § 1154, subsection (a)(4) requires the court to issue a protective order “to limit the use of the part of the transcript or the recording to the judicial proceeding” and “to prohibit dissemination of the part of the transcript or the recording to any person that does not need access to the part of the transcript or the recording for the proceeding.”

It is true that private parties litigating contested cases involving air crash liability have been routinely granted access to cockpit voice recorder recordings and transcripts subject to appropriate protective orders. A recent ruling illustrates how courts strike a balance under these statutes between litigants’ need to access to cockpit voice recorder tapes and the restrictions placed on litigants to prevent improper release of the tapes to the public:

The Court specifically finds that the tape is one of the few neutral pieces of evidence available to plaintiffs to support their claims, and, as such, it is clearly relevant under Rule 26(b). See *In re Air Crash Disaster at John F. Kennedy Int’l Airport on June 24, 1975*, 687 F.2d 626, 630 (2d Cir. 1982) (“The CVR tape is an important piece of evidence in an aircrash case.”). Moreover, the transcript of the tape is insufficient since, as plaintiffs note, it is not complete and it does not reflect noises that might be meaningful to plaintiffs’ experts. *In re Air Crash in the Florida Everglades on May 11, 1996*, MDL 1131, CV 96-1542-CIV-DAVIS (order filed May 28, 1999); *In re Aircrash Near Roselawn, Indiana on October 31, 1994*, MDL 1070, 95 C 4593 (N.D. Ill.) (Order filed December 4, 1996). . . . Finally, a protective order will prevent the dissemination of the CVR tape in a manner contrary to Congress’ intent in enacting 49 U.S.C. § 1154. If the existing protective order is not sufficient to prevent the tape from being used for sensational or unwarranted purposes, the parties can enter into a more detailed protective order, as has been done in other aircrash cases. See, e.g., *In re: Air Crash at Agana, Guam on August 6, 1997*, MDL 1237, ML 7211 (C.D. Cal.) (Order Filed February 12, 1999).²⁰

These statutes and the courts enforcing them strike an appropriate balance between the privacy concerns so often expressed by pilots and the private and public need for core data upon which to investigate and, when warranted, litigate air disaster cases. The same would hold true regarding cockpit image recorders.

Former NTSB Chairman James Hall summarized the privacy issue in a recent speech:

The Safety Board is sensitive to the privacy concerns that have been expressed by pilot associations and others with respect to recording images of flight crews. In order to protect crew members' privacy, the Safety Board, in its request for reauthorization, asked Congress to apply the same protections that exist for CVRs to the use of image recorders in all modes of transportation. Under these provisions, a cockpit image recording would not be publicly released.

The Board also is aware of concerns regarding the treatment of video (as well as other types of recordings) in foreign accidents, and we're working with ICAO to improve protections afforded to recorded information on an international level.²¹

Any privacy concerns imaginable can be adequately addressed by legislation, including any concern that an employer may elect to use a cockpit image recorder to review its pilots' conduct. It is inappropriate for the pilots' associations to use the privacy issue as a sword in an attempt to defeat or delay a government mandate for video cameras in air transport cockpits. We agree with former NTSB Chairman Hall's statement: "given the history of complex accident investigations and the lack of crucial information regarding the cockpit environment, I believe that the safety of the flying public must take precedence over all other concerns."

The Bottom Line

Cockpit image recorders would exponentially assist the NTSB in its efforts to rapidly, effectively and efficiently determine the factors related to an aircraft accident. Have you ever heard the expression that a picture is worth a thousand words? Are images of a pilot's actions, or lack thereof, too much to ask for? Why not give the leading investigative body in the world what it has sought for

years? Is there really such a thing as *too much* information when air safety is involved?

Automatic information recording devices such as cockpit voice and flight data recorders have proven to be very useful in gathering *factual* information after an air crash. The fact that this information is recorded immediately prior to and during the accident sequence often gives investigators the ability to quickly determine and correct a problem. This knowledge results in the development of timely and more precise safety recommendations that are likely to reduce future similar accidents. Images of the cockpit would not only help investigators but enhance air safety.

Five years is enough delay. If the FAA had acted in 2000, as the NTSB requested, the cockpits of our air transport aircraft would already have the video cameras they need installed.

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Endnotes

¹ 49 U.S.C.S. § 1132(a)(1)(A).

² 49 C.F.R. § 800.3.

³ *Id.*

⁴ National Transportation Safety Board. 1990. *USAir Flight 105, Boeing 737-200, N283AU, Kansas City International Airport, Missouri, September 8, 1989*. Aircraft Incident Report NTSB/AAR-90/04, Washington, DC.

⁵ *Id.*

⁶ NTSB Safety Recommendation A-00-30 and A-00-31, p. 1 (April 11, 2000).

⁷ NTSB Most Wanted Transportation Safety Improvements 2004-2005; http://www.nts.gov/recs/mostwanted/aviation__recorders.htm.

⁸ *Id.*

⁹ Carol Carmody, Remarks at the NTSB Public Hearing Concerning Aviation Image Recording (July 27-28, 2004) (transcript available at http://nts.gov/Events/2004/av__img__rec/agenda.htm).

¹⁰ Transcript of NTSB Public Hearing Concerning Aviation Image Recording, p. 25 (July 27, 2004) (transcript available at http://nts.gov/Events/2004/av__img__rec/agenda.htm).

¹¹ *Id.* at 46-47.

¹² Available at http://www.alliedpilots.org/Public/Publications/Perspective/pp__v7.pdf. *Pilot Perspective* is an official publication of the Allied Pilots Association, representing the approximately 13,000 pilots of American Airlines.

¹³ Air Line Pilots Association, International Cockpit Images Recorders, www.alpa.org/Default.aspx?tabid=240.

¹⁴ Available at http://www.nts.gov/recs/mostwanted/aviation__recorders.htm.

¹⁵ NTSB Safety Recommendation A-00-30 and A-00-31, pp. 2-3 (April 11, 2000).

¹⁶ Transcript of NTSB Public Hearing Concerning Aviation Image Recording, p. 288 (July 27-28, 2004) (transcript available at http://nts.gov/Events/2004/av__img__rec/agenda.htm).

¹⁷ *Id.* at 223.

¹⁸ *Id.* at 70-71.

¹⁹ 49 U.S.C.S. § 1154.

²⁰ Available at http://www.aviationtoday.com/cgi/av/show__mag.cgi?pub=av&mon=0101&file=0101viewpoint.htm.

²¹ *McCoy v. Southwest Airlines Co.*, 208 F.R.D. 617, 620 (C.D. Cal. 2002).

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