ASRS Directline

A Newsletter by the Analysts of NASA's Aviation Safety Reporting System

The Aviation Safety Reporting System
is a cooperative program established
by the Federal Aviation Administration's
Office of The Assistant Administrator
for Aviation Safety, and administered by the
National Aeronautics and Space Administration.

ASRS INTRODUCES...

by Ed Cheaney

...ASRS Directline, a new quarterly publication designed to return to the aviation public information received at NASA's Aviation Safety Reporting System (ASRS) office in Mountain View, California. The airmen now comprising the ASRS technical staff occupy a unique vantage point from which to view the operation of the aviation system. All are experienced pilots or controllers who have taken on two demanding tasks at ASRS. Firstly, they process incoming ASRS reports to pinpoint the human or system factors involved in each occurrence, remove all reporter-identifying information from each record, and prepare incident records for insertion into the computerized database. Secondly, they conduct in-depth review of aviation safety topics using the information in the database.

Reports are currently arriving at a rate of about 3,000 per month. ASRS's standard analysis process insures that each one is examined and evaluated independently by at least two members of the technical staff. This means that every quarter each of these thoroughly experienced professionals reviews an average of 1,000 submissions describing incidents or situations regarded as safety-critical by the pilot or controller reporters.

Each report receives full and thoughtful attention. Inevitably, however, a small number of reports examined in each quarter strike an analyst as being especially important, interesting, or novel depending on the analyst's particular experience and professional sensitivities.

This quarterly journal is a forum in which the ASRS technical staff speaks out on a selected set of topics suggested by individually provocative reports received at ASRS during the reporting quarter. Each staff member nominated a number of topics; the final set appearing here was screened for inclusion by the full group. The discussions, each drafted by the staff member submitting the chosen topic, are not research study reports in the classic sense. Instead, they present current thoughts, including subjective reactions, about the operation of the aviation system by a deeply involved, experienced, and uniquely qualified group of professional airmen.

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Reports received to August 1990 were utilized in the preparation of articles contained in this issue.

ARTICLE	ASRS REPORT
Readback / Hearback	#96032 #96167
Air Traffic Control and Aircraft Performance	#115246 #105785
There I Was... ...At Least I Thought I Was	#68636 #44466 #41266 #117306
The Tiger In Your Tank	#119619
Time Allocation and Navigation Errors	#118642 #118988 #117339

Although the discussions in this issue were inspired by reports received in the current quarter, the authors, in the course of preparation, routinely searched the ASRS data base to avail themselves of pertinent reports related to the topic. Copies of these reports are available without charge to interested readers. To obtain them, write to:

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READBACK / HEARBACK

by Bill Monan

Problems

What's going on up there? puzzle ATC controllers in their reports to the ASRS involving numerous pilot errors in clearance readbacks. *What's going on down there?* query airmen reporters who dutifully read back ATC instructions only to be subsequently informed that they have "busted" their altitudes, turned to wrong headings, lined up with wrong parallel runways or have descended below minimum safe altitudes.

"What's going on"—as indicated in ASRS data—is that all too frequently airmen are reading back wrong numbers and the ATC controllers are failing to catch the pilots' errors in the readbacks. We call this the hearback problem.

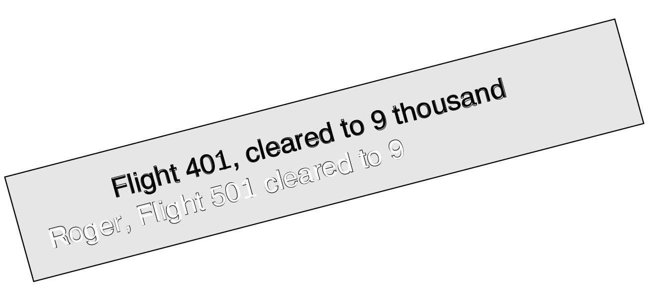
The ASRS has published several studies on pilot/controller communications breakdowns. The FAA and the industry have actively campaigned for improvement in these areas. Yet, ASRS submissions confirm that hearback problems in pilot / controller communications continue to be acute.

Causes of Communications Breakdown

Why aren't pilots "getting it straight?" We examined a sample set of ASRS reports from airmen and controllers, and identified four major patterns of causal sources for pilot errors in their readbacks.

Readback Problems

(1) **Similar aircraft call signs**. Airlines with their hub operations, have set a major trap for their airmen. Trips 40**1**, 40**2**, 40**3** .... Flight ABC**1** and XYZ**1**, GY**C** and GY**E**—all operating on the same frequency, at the same time and in the same airspace. "Good for marketing," protested a reporter, "no good for us."



(2) **Only one pilot listening on ATC frequency**. "Picking up the ATIS" and "talking to the company" represented a time-critical gap in backup monitoring during two-pilot operations.

(3) **Slips of mind and tongue**. The typical human errors in this category included: Being advised of traffic at another flight level and accepting the information as clearance to that flight level; the classic "one zero" and "one one thousand" mix-up; the L/R confusion in parallel runways; the interpretation of "maintain two five zero" as an altitude rather than an airspeed limitation.

(4) **Mind-set**, **pre-programmed for..., and expectancy factors**. The airmen who request "higher" or "lower" tend to be spring-loaded to "hear what we wanted to hear" upon receipt of a blurred call sign transmission.

The incident set included traffic conflicts, altitude busts, crossing restrictions not made, heading/track deviations, active runway transgressions, and mix-ups of takeoff clearances and parallel runways. Two reports of controlled flight toward terrain were reported.

Hearback Problems

"Why didn't the controller catch the pilot error?" was the questioning theme in the data set. While the sources for pilot readback failures were clearly delineated in the narratives, hearback deficiencies diffused into a tangle of erratic, randomly overlapping causal circumstances. But the underlying problem seems to be the sheer volume of traffic: the 9 a.m. - 5 p.m. rush of departures/arrivals; the behind-the-scenes tasks of land-lines, phones and hand-offs; the congested frequencies with "stepped on" transmissions; the working of several discrete frequencies; and, at times, the time and attention-consuming repeats of call-ups or clearances to individual aircraft. These activities, together with human fallibilities of inexperience, distractions and fatigue set the stage for hearback

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failures. Indeed, a series of pilot narratives recognized controller "overload," "working too many aircraft," "overwork" and frequency saturation.

These facility conditions provide strong motivations for airmen to drop any "how-the-system-is-supposed-to-work" idealism and adopt a more realistic approach to cockpit communication practices. As a working premise, airmen should assume that during congested traffic conditions, the controller may be unable to hear, or is not listening to their readbacks.

Digging Deeper

The report set included a number of aggressively optimistic assumptions on the part of pilots regarding ATC performance. Reluctantly, but more and more frequently, airmen are accepting silence as a confirmation that readbacks are correct. Pilots respond to doubtful or partially heard clearances with perfunctory readbacks expecting controllers to catch any and all errors.

Airmen hold to the illusion that ATC radar controllers are continuously observing their aircraft as they progress through the airway structure. The reality is that controllers continually scan the entire scope; they generally do not focus on individual targets. Descent clearances that "seem a little early" or to altitudes that "seem too low" or turns in the wrong direction may well be intended for another aircraft.

*"The dim shape of the mountain came into view ... seconds before the '**WHOOP... WHOOP... PULL UP'** sounded."*

Finally, airmen who fail to brief upon minimum safe altitudes within or near a terminal area or during the approach phase are vulnerable to readback / hearback errors leading to "controlled flight toward terrain." Such an event is described in an ASRS report from a shaken pilot who admitted to not checking the charts prior to a night time descent:

> "The dim shape of the mountain came into view...seconds before the 'WHOOP...WHOOP...PULL UP' sounded. We both pulled back abruptly on the controls and climbed..."

The ATC controller's report added further details: "The tapes revealed that I had told the pilot to descend to 7,000 feet (6500 is the MEA) but he had read back 5,000. He got down to 5,700 feet, about 2 miles from a 5,687 foot mountain before I saw him."

Summarized the airman, "I don't know how much we missed by, but it certainly emphasizes the importance of good communications between controller and the pilots."

"Reading the tape" was the final administrative step that identified the readback/hearback sequence in a recent NTSB assisted international accident investigation:

Time - 06:32
CONTROLLER :
"Air Carrier ABC, descend [to/two] four zero zero. Cleared for the NDB approach..."

PILOT :
"Okay, four zero zero."

TAPE READOUT :
"WHOOP . WHOOP . PULL UP"
"WHOOP . WHOOP . PULL UP"

Time - 06:34
SOUND OF IMPACT

Summary and Recommendations

When pilots read back ATC clearances, they are asking a question: "Did we get it right?" Unfortunately, ASRS reports reveal that ATC is not always listening. Contrary to many pilots' assumptions, controller silence is **not** confirmation of a readback's correctness, especially during peak traffic periods.

Pilots can take several precautions to reduce the likelihood of readback / hearback failures:

- Ask for verification of any ATC instruction about which there is doubt. Don't read back a "best guess" at a clearance, expecting ATC to catch any mistakes.
- Be aware that being off ATC frequency while picking up the ATIS or while talking to the company is a potential communications trap for a two man crew.
- Use standard communications procedures in reading back clearances. "Okays," "roger's," and mike clicks are poor substitutes for readbacks.

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Air Traffic Control and *Expected* Aircraft Performance

by Ed Arri

Traffic Separation

The separation of IFR aircraft by air traffic controllers is based on a number of known factors. One of these factors is the anticipated performance of the type of aircraft, as aircraft of similar type generally climb, descend, and turn in a like manner. Controllers are familiar with the performance of these aircraft and base their instructions on what they expect the aircraft to do. But pilots do not always do the expected. Here are some examples.

Conflict On Departure

In one ASRS report, a heavy air carrier jet [aircraft 1] made a *wide* left turn after departure, while the second aircraft, also a heavy air carrier of similar type [aircraft 2] departing the same runway made a *tight* left turn. A loss of separation resulted from the differing performance exhibited by these two aircraft. The controller was busy with 10 to 12 other aircraft and stated that by the time he saw the developing situation, "...the two aircraft were about 4 miles apart, but converging rapidly. I climb[ed] [aircraft 1] to 11,000 feet and attempted to stop [aircraft 2's] climb." The controller also said that "...when the targets converged, I estimated that [aircraft 1] was 1000 to 1200 feet above [aircraft 2]. However I don't think I had the required separation all during this time." The reporter believes that the "...primary cause of this incident was [aircraft 1] turning much wider than **expected***, and [aircraft 2] turning much more sharply and climbing much more quickly than **anticipated***." (*Emphasis added.)

Conflict on Descent

In another ASRS report, a controller had opposite direction traffic in his sector at FL330 and FL310 with good spacing between aircraft. The higher aircraft (at FL330) was approaching destination and requested a lower altitude. The controller, expecting a normal rate of descent, issued a clearance to the higher aircraft to descend to FL250. This aircraft had over 4 minutes to descend through the altitude of the aircraft at FL310, and to FL290 or below in order to maintain legal separation. (There were 14 or 15 other aircraft also being worked by the controller, thus he was unable to devote full attention to the descending aircraft.) Soon, however, the controller noticed that the aircraft descending out of FL330 had a "...rate of descent [that] was 400 feet per minute, slower than expected." Recognizing a deteriorating situation, he turned one aircraft 20 degrees; however the turn was not timely enough to prevent a loss of separation and an operational error.

Examples of Unanticipated Performance That Cause Problems For ATC

- An aircraft on departure leveling off momentarily, increasing airspeed, and inadvertently overtaking the first departure
- Aircraft clearing the runway too slowly after landing, resulting in a go-around for the following aircraft.
- Pilots' failing to advise until too late that SID restrictions cannot be met.
- Pilots' accepting clearance for an immediate take-off, and then delaying in position.
- Aircraft prematurely slowing to approach speed, leading to excessive vectors for other aircraft.
- Pilots' acceptance of an altitude crossing restriction, and then announcing too late "...unable to comply."
- Pilot deviation from an assigned route or vector heading for weather avoidance without ATC approval.

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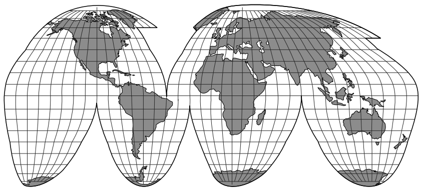
Time Allocation... ...and Navigation Errors

by Roy Chamberlin



INTERNATIONAL

The ASRS program has just celebrated its 13th year of operation and it is interesting to note that there are still an uncomfortable number of track deviations on over-water flights being reported. Even one would be uncomfortable to the individuals involved.

Common Threads

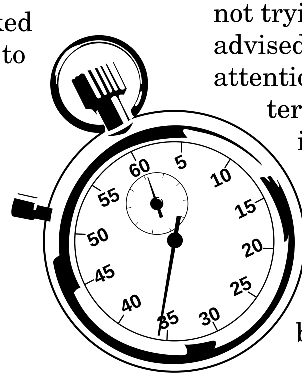
Incorrect Waypoint Entry

There do seem to be a couple of common threads within most of the track deviation reports. The first is that the wrong coordinates were placed into the primary INS or Omega navigation unit, yet these were not identified as being incorrect.

States one reporter: "I reloaded waypoints 6 through 9 using the remote feature of our system..." A short time later "...I also inserted the #1 and #2 waypoints which included the erroneous...coordinates." In another report, the pilot explains "...ATC advised me I was going south, [I] had set the wrong coordinates in the computer..."

Distraction

The second thread is that input of erroneous data occurred at periods of high activity (usually a re-route with the associated INS updates) coupled with other distractions that added to the workload of the flight crew. In an example of re-route activity, one reporter writes: "Our flight appeared to be totally routine until approaching [VOR]...At that time we received a track change re-route...I immediately asked the flight engineer for the track message to update the INS's...A radio frequency change to [Center] took place in a few moments...I then began to complete the remainder of my paperwork involved with a track change..."



Sometimes there seemed to be too many changes. In the reporters own words:

"At about level off —

(1) [Center A] cleared me off route...this required INS change.
(2) [Center B] changed the oceanic route...this required INS change as well as re-plot.
(3) [Center C] cleared me...this required INS change.
(4) [Center C] re-cleared direct...this required INS change and re-plot.
(5) [Center C] (on next frequency) re-cleared me ...this required INS change and re-plot [etc.]"

And sometimes distraction has its origin in normal routine: "...Captain was having breakfast" at the same time a re-route and frequency change occurred, which appears to have taken him out of the loop. The error was not caught in time to prevent a major track deviation. "[Center] gave us a 90 degree correction to the right...and advised us we were off course and in [foreign and unfriendly] airspace."

Tying The Threads: Critical Phase of Flight

Because the developing conditions experienced by these flight crews were not extraordinary, they did not recognize that high workload compounded by distraction produced a situation of overload. In the analysis of many previous reports where the flight crews were placed in situations of overload, important numbers and information tended to be disregarded or discarded. The pilot might look, but he or she did not recognize a discrepancy. In each of the situations presented, the flights were viewed as normal or routine by the flight crews, but were actually near, or in, *a critical phase of flight*.

The Solution: Time Allocation

The solution to the problem of task overload lies in not trying to do too much at one time. Pilots are advised to delay some tasks to a time when proper attention may be devoted to that task. (ASRS has a term for this—we call it "Misplaced Duty Priority.") In the analysis of one of the reports used in this article, had the flight crew performed only the minimum necessary items at the time of the re-route, such as entering the next required waypoint and completing the gross error check, they would likely not have been overloaded.

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The Tiger In Your Tank

by Perry Thomas and Charles Drew

The Tiger's Trap

Recently, an airline pilot on a pleasure flight in his light twin stopped at an airport in a south eastern state to file a flight plan and fuel before continuing on the over-water portion of his flight to the Bahamas. Requesting that the fixed base operators' fueler fill the main and auxiliary tanks, he went inside to do his paperwork and get a bite to eat with his traveling companion. He returned to the aircraft about 45 minutes later, servicing both engines with oil and draining the fuel tank sumps during his pre-flight. Start-up and taxi-out were followed by engine run-up. Everything appeared normal.

After take-off, power reduction and initial climb, the pilot was cleared to Center frequency. Good cockpit discipline was a habit for this experienced pilot as he utilized his normal instrument scan. In his own words, "...during my scan I noticed the left cylinder head temperature was above the red line. The right cylinder head temperature was slightly high. I tapped the gauge and checked all other indications—oil pressure was a little bit low but in the green band. Oil temperature had risen slightly, but was also within limits. I reduced power on the left engine and notified Center that I needed to return for landing. By now the left cylinder head temperature had come down well into the green band."

After landing, the pilot taxied to the FBO's ramp, noting that all engine indications were normal as he shut down. Post-flight inspection revealed no problems and the pilot decided that he had experienced a gauge problem. Requesting that *the fuel tanks be topped off*, he went back inside to re-file his flight plan.

About 30 minutes later he again pre-flighted the aircraft, and using the check list completed engine start and taxi out. A thorough engine run up ensued and "...left and right engines checked OK with all engine instruments normal. After take off I watched the cylinder head temperatures closely. As I made the first power reduction to 25 inches manifold pressure and 2500 RPM, the left cylinder head temperature began to rise. I stayed with Tower, reduced power, came back in and landed." The third taxi-in and shut-down of the day was accomplished without incident.

By now convinced that he had a mechanical problem, the pilot once again entered the offices of the FBO to search for a mechanic, no easy task on a Sunday. Entering into discussion with an FBO employee, he was informed that there was a possibility of fuel contamination. The pilot of a high wing single-engine aircraft had spilled some fuel down his arm while draining his fuel tank sumps, and had become suspicious when he noticed the faint smell and oily feel of kerosene. The single-engine pilot conferred with several other pilots also doing pre-flights and they collectively decided that the 100 low lead aviation gasoline was contaminated with jet fuel.

New Twist on an Old Problem

Subsequent investigation revealed that the 100LL avgas was indeed contaminated, but there is a different twist to this all too common occurrence. The fuelers had not made the mistake of pumping jet fuel into reciprocating engine light aircraft; it was the trucks themselves that were contaminated. Nor had the trucks been filled from the wrong storage tank at the tank farm. Upon delivery from the refinery, 8,000 gallons of jet fuel had been accidentally added to the FBO's 100LL storage tank, creating the first level of contamination. The trucks were filled from this tank, and the percentage of jet fuel was reduced again, creating the second level in the contamination. Finally, the trucks filled the aircraft tanks and the third level of contamination occurred. By now the percentage of jet fuel was so low that *normal pre-flight fuel tank sump inspection did not reveal an observable color change in the blue 100LL fuel*.

A number of aircraft received the contaminated fuel, of which a few actually got airborne. In the words of the reporter, "...fortunately no one was injured or killed as a result of the contaminated fuel, and the circumstances of this incident merit review to prevent a recurrence." Examination of the reporter's aircraft the next day revealed significant damage to both engines. Engines are now being replaced on several aircraft, including the reporter's light twin.

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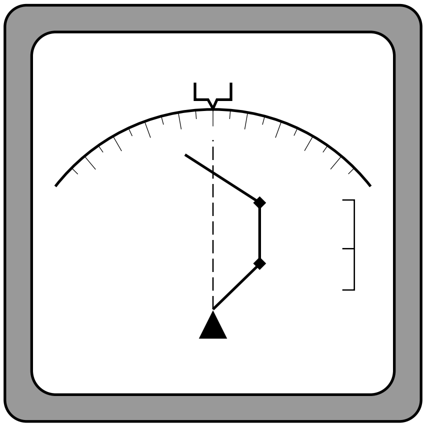
There I Was...
...At Least I Thought I Was

by Mike Smiley

Advanced TECHNOLOGY Aircraft



Recently an incident was reported to ASRS that emphasizes the need for flight crews flying advanced technology aircraft to back up the computer-generated route and navigation database with "old fashioned" navigation charts. Let's examine this incident through the eyes of the reporting flight crew:

> "We were in the approach portion of the flight, among scattered cumulus clouds and thunderstorms, on autopilot with LNAV and VNAV engaged. We had been told to expect no delays. Approach Control gave traffic ahead holding instructions at [intersection A] with right turns instead of the published left turns because of a thunderstorm. We verified the cell on our radar and received holding instructions, also at [intersection A] with right turns. When we were about 20 miles from [intersection A], Approach Control issued clearance for us to hold at [intersection B] because of weather. We tried to enter [intersection B] as a waypoint but the computer rejected it as 'not in NAV DATA BASE.' By the time we located the distance from the VOR to [intersection B] on our charts and switched to VOR mode we were past the intersection. The controller asked us if we knew we were 5 miles past [intersection B] and issued a heading. We complied and shortly after were vectored inbound."

A rare occurrence? An isolated event? Not at all! You can find related incidents in the ASRS database spanning many years and involving virtually every phase of flight.

Phase of Flight

Departure Phase

> "After receiving clearance, a departure route was programmed into the FMS. Ground Control asked if we would accept Runway 01, but we declined due to crosswind and requested Runway 28. I changed the runway in the FMS but in the process of programming, I did not activate the revised departure route. The result was that no course line was displayed from the runway to the first fix. Confusion and lack of communication between the captain and myself led to our lack of 'a last minute' verification of charts and specific departure procedures. After takeoff the Captain initiated what he thought was the correct turn. Departure Control soon asked us if we were flying the revised departure route. We replied 'Negative.' "

The flight crew sums it up—"Problems of this type can only be avoided through greater vigilance and a commitment to use whatever caution necessary to avoid such errors; one must avoid undue dependency on computer generated flight paths."

Enroute Phase

The enroute phase is the phase of flight where technology has supposedly all but eliminated workload. Or has it? "The controller instructed us to hold at [intersection B] on the airway, left turns, 10 mile legs. I inadvertently started to hold at [intersection A] and ATC told us to turn right immediately to a 090 degree heading. He then cleared us direct to [intersection B] to hold on the airway..." The crew suggests complicating factors, among them "relying on the database without maps available."

Descent Phase

Descent and crossing fixes add their share to the dilemma:

> "We were issued clearance to cross 50 [miles] north of the VOR at [FL] 270. I punched it into the FMS using a new waypoint I thought was 47 north of the VOR. However the aircraft had not begun descent when ATC asked us how far north of the VOR we showed. As the VOR receivers tune automatically, it took a few moments to find a chart and obtain the VOR frequency—whereupon we discovered we had just passed the 50 mile fix."

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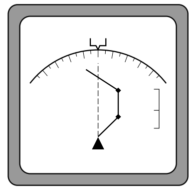


There I Was...*continued*

Approach Phase

Even the approach phase is not immune from track errors, although this is usually where the crew is very alert:

> "The FMC was working slowly and incorrectly. We set up the computer for the ILS approach and received vectors from ATC. I thought the vectors were for the ILS but they were really for the VOR approach to a visual. Tower then said we were too high, and, if the field was in sight that we were cleared for a visual approach."

ATC Involvement

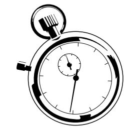
Sometimes re-programming woes appear to be caused by a combination of ATC not understanding flight crew workload, and the flight crew not being ready for changes. ATC clearance amendments that are not on the FMC route of flight can pose significant workload increases for flight crews flying advanced technology aircraft, even when the flight crew is able to comply. If the clearance change is received when the workload is already high, such as immediately prior to takeoff, the result can be even more dramatic:

> "Tower said '...cleared for takeoff, maintain 2000 feet, at [VOR] 154 degree radial turn left heading 220 degrees.' We had to sit on the runway, pull out different maps, install the 154 degree radial, locate the [VOR] identifier and reset clearance altitude."

Conclusions

As we all know, today's ATC environment is getting more congested and complex. Advanced technology aircraft systems, though reliable, are not perfect and will occasionally malfunction. **A sure defense against this condition is to have all appropriate charts available. Additionally, if any difficulty is encountered** in programming or utilizing automated flight management systems, **don't hesitate to take manual control of the aircraft** and fly it where you are supposed to go. Implement these two simple rules and you will avoid, "...at least I thought I was there."

Time Allocation...*continued*



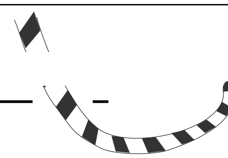
In summary, available time should be allocated to the task with the greatest priority. As soon as that task has been satisfactorily handled, another task will now have the greatest priority. Pilots are advised to avoid the tendency to rush or hurry through a given task.

For those airlines that do not already do so, the problem of time allocation should be addressed in recurrent or initial training guides, and emphasis should be given to the hazards of "tunnel vision" during critical phases of flight

* * * *

Transoceanic deviations most likely started with Columbus who was highly praised for finding the New World, when all he wanted was to find the Northwest passage. Upon returning to Spain he told Queen Isabella, **"The Center gave us a call..."**

The Tiger In Your Tank, *con*



Avoiding The Tiger

Two recommendations for avoiding the dangers of fuel contamination can be based on this incident.

1. Fuel retailers should check for fuel compatibility before fuel transfer operations.
2. Pilots should be advised to check the smell and perhaps the feel of fuel samples in addition to visual inspection for contaminants and color.

The problem of aviation gasoline contaminated by jet fuel is not a new one. While most turbine engines have tolerance for aviation gasoline, the reverse is not true; reciprocating engines may be damaged by very low levels of jet fuel. Recent adoption of different type nozzles on the fuel truck dispensers have reduced but not, as we can see, entirely eliminated the problem. A line service manager who was consulted for information for this article suggested the possibility of different size, or different type hose connectors for storage tanks and delivery trucks, thus making inadvertent hookup to the wrong tank difficult. FBO fuel service personnel need also to practice greater vigilance in fuel transfer operations. The final check remains with the pilot, of course. The examination of a fuel sample by **smell** and **feel** in addition to the usual color check might well be advised—perhaps he may avoid "the tiger in the tank."

Readback / Hearback, *continued...*

Controllers can also take steps to safeguard against readback / hearback failures:

- Be aware that an altitude mentioned for purposes other than a clearance, such as a traffic pointout, may occasionally be interpreted by pilots as an instruction to go to that altitude.
- Deliver cautionary messages such as “similar call signs on frequency” to help reduce call sign confusion.

The consequeces of readback / hearback failures vary, but when they occur in the context of high rate of climb / descent operations, ASRS reports frequently conclude: “It was too late to intervene—the aircraft had already passed through an occupied altitude.”

The Future

Reflecting a major trend in ASRS data, the report set poses troublesome questions concerning the ATC-pilot communications procedures. Are traffic growth and congested frequencies compressing the traditional to-from-to exchanges into a one-way transmission? Are airline managements aware of the similar call sign problem? Are airmen placing full-time confidence upon a confirmation procedure that works only part of the time? Can data link help solve some of these problems? Postulated a pilot reporter: “If, in truth, controllers are unable to listen, then we should change the system.”

ATC & Acft Performance, *continued...*

In the conclusion of his narrative, the controller reporter recommended that “...pilots advise if they cannot comply with AIM suggested descent rates.”*

Summing It Up

If a standard rate turn cannot be made, or a climb/ descent rate is anticipated to be other than normal, notify the controller so that an alternate plan can be used to ensure separation. With the number of aircraft using the ATC system today, good communication and a clear understanding between the controller and pilot on what is expected is absolutely essential for a smooth and safe flight.

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* Paragraph 270 (d) of the Airmans Information Manual directs that ...“When ATC has not used the term ‘AT PILOT’S DISCRETION’ nor imposed any climb or descent restrictions, pilots should initiate climb or descent promptly on acknowledgement of the clearance. Descend or climb at an optimum rate consistent with the operating characteristics of the aircraft to 1,000 feet above or below the assigned altitude, and then attempt to descend or climb at a rate of 500 feet per minute until the assigned altitude is reached. If at anytime the pilot is unable to climb or descend at a rate of at least 500 feet a minute, advise ATC.”

In The Works **for the next issue of** ***ASRS Directline*****:**

- **The One Zero Thousand / One One Thousand Problem**
- **Hectopascals—International Flight Operations**
- **High Altitude Engine Failures**
- **The Last Leg Syndrome**
- **Weather Deviations—The Continuing ATC / Pilot Conflict**

Dear Reader,

The NASA Aviation Safety Reporting System (ASRS) program has just completed it's thirteenth year of operation. During this period more than one hundred twenty eight thousand reports have been received from all segments of the aviation public. The reports range from student pilot problems to human factor and design problems of the most advanced technology aircraft. As part of our ongoing efforts to return this information to the aviation community, ASRS has produced a new quarterly publication, "***ASRS Directline***."

As you have seen, the articles are based on actual ASRS reports that have been identified as significant by ASRS analysts during the current quarter. You have received issue number one. This is a limited edition being distributed for comment to a select group of aviation leaders. We are very interested in your reactions to this publication. If you have comments, please fill them out below, detach the post-paid page, fold, and drop in the mail. In the near future, we will be contacting a select few of you for comments; time and resource restraints will not permit us to contact all of you.

I would like to thank you in advance for your contribution, as we at NASA's ASRS program would like to make "***ASRS Directline***" one of the best aviation publications available.

Sincerely,

W.D. Reynard
Director ASRS

Comments and Suggestions:

Cut Comment page along dashed line, fold, staple or tape, and drop in mail