

Incursion Prevention Technique #1

A message from Mr. Dan Cilli, Senior Systems Analyst, Air Traffic Specialty Runway Safety Program Office

As I travel widely speaking to numerous pilot groups, I get exposed to cockpit activities that could explain to the ATCS why apparent breakdowns in communication between the pilot and controller occur. Here is a procedure that we picked up on in separate meetings with pilots from World Airways and FEDEX.

FAA regulations require an airline flight crew to brief their arrival procedures before beginning their final descent. Some companies have expanded this regulation to include the landing rollout, turn-off, and taxi routes to the gate. Some commercial aircraft are equipped with a separate nose wheel steering mechanism that is located only on the captain's side of the cockpit. Captains will often share the flight control responsibility with their co-pilot. The captain in the left seat will be at the controls from takeoff to landing for one whole flight while the first officer operates the navigation system and is the chief communicator with ATC. On the next leg, the roles will often be reversed. Consider these three examples and the complications they pose to both the flight crew and the controller.

EXAMPLE 1:

If ATC issues a turn off the runway opposite direction to what the flight crew anticipated and briefed prior to final descent, the crew - according to company policy - must complete another partial briefing among themselves for the voice recorder.

EXAMPLE 2:

If ATC issues an unexpected turn-off and taxi route too soon in the landing rollout (speeds in excess of 60 knots), the communicating flight officer will usually have the flight controlling officer stop the aircraft after clearing the runway to conduct the amended briefing.

EXAMPLE 3:

If the aircraft in use is one with the nose wheel steering only on one side and the co-pilot was at the controls for the landing, the co-pilot must make a handoff to the captain for the taxi to the ramp. If the taxi instructions were other than that which was briefed by the crew, the handoff has two elements: the co-pilot must conduct the control transfer and the captain has to inform the co-pilot why he will not be executing their previously briefed route.

And remember, during all of these internal responsibilities of the flight crew, someone has got to be listening and responding correctly to subsequent transmissions from ATC, as well as assuming the task of retracting the flaps, changing radio frequencies, communicating with flight operations and/or ramp control, switching the transponder to standby, and several other post-landing activities that add to cockpit task saturation.

THE BOTTOM LINE:

The fact that flight crews seldom make a mistake during this period of expanded workload is commendable. But the reality for the controller is that the chances of something going wrong in our exchanges with commercial pilots are considerably higher during this phase of activity. ATC's timing of essential exchanges could actually complicate flight deck situational awareness and create an atmosphere that leads to a pilot deviation and incursion. In our OJT process, we've often conveyed the "when" in our timing of landing/rollout communications. We just wanted to add some "why" to your knowledge bank.

Incursion Prevention Technique #2

Human Factors, Denial, CRM, Technology...and more

We all tend to deny making mistakes in a society that blames and demands heavy penalties from those of us who do make them, especially ones with huge financial implications such as aircraft accidents.

Denial is a defense mechanism that is used in our society to ensure our survival. All elements must be open to introspection if we are to displace the potential for disaster with triumph.

Human Error is seldom proven as the cause of an accident either because of denial (tunnel vision) or death.

Doctors/Pilots/ATCS's are good at denying their liability in an incident/accident.

Two levels of Human Error: the potential for it; and owning up to the potential for it. We won't crack the former until we peel away the latter.

Flying: long periods of boredom interspersed with the need of concentration and rapid decision-making actions.

The image of the original pilot (barnstormers) is identical to that of today's enthusiast of "extreme sports." But the image has changed to that of the cool, calculating, professional who is paid for what he does and what he knows (Are you like James Bond...?)

If this is true -- what should I do? Revelation/Response. True truth.

We have to be willing to change as quickly as the environment (technology) that we are creating.

There was a least 5,900 years of recorded History in which man's desires and efforts to fly were either unsuccessful OR considered by many as man's sinful desire to be rid of another unwanted shackle fastened to him by a protective god. But it only took 85 years for man to progress from the first flight to a flying Airbus with all it's capabilities of height, speed, distance, and passenger load.

Man-made machines are becoming more sophisticated, but mankind's propensity to make human errors remains constant.

The highly automated aircraft is almost deified and pilots could become unwilling to challenge or contradict the equipment.

Pilot Error vs. Human Error: a first-time student pilot will make numerous pilot errors. A well trained, certified pilot will seldom make a pilot error; but the potential for Human Error remains equal for both

Enforcement action against pilots by the Flight Standards District Office should only be initiated for Pilot Error, not for Human Error.

What is the distinctive in ATC between Controller Error vs. Human Error? One should be dealt with as a deficiency requiring remedial training. The other needs to be dealt with as a Revelation/Response.

Aviation is simply a less forgiving environment when a human error occurs.

Situational Awareness example: The Eastern Airlines L1011 incident at MIA with the bad landing gear indication that resulted in CFIT Everglades - 1972. Poor controller phraseology in response to the low altitude alert: "How are things coming out there?"

Cockpit hierarchy (which is even stronger in Eastern nations) can cause the First Officer to weigh offering advice that may be unwelcome against offering advice that may be wrong.

Lufthansa directive: The officer flying at the time of an emergency shall continue flying while the other officer(s) determine what is wrong. Then the entire flight crew will consult with each other concerning the action to be taken. It must be a unanimous decision.

CRM skills (Communication) became a prevalent training activity after a 1979 study revealed Poor Communication Skills/Poor Crew Cooperation caused more errors than did poor technical skills.

For every task, there is an optimum level of arousal. Extremes, high or low, reduce any possibility of good decision-making.

The experience level of the new "right-seaters" in our nation's airlines is probably lower now than it has ever been.

As stress increases in an emergency situation, the skills that a pilot will resort to are more often the ones initially learned rather than the latest techniques practiced in the simulator. This is referred to as "regression of learning."

Pilots, cabin crew, ATCS, dispatchers, and AMT's are all responsible for the outcome of a flight. Human factors must be part of training and certification. (Hopefully this will also include management.)

One area avoided thus far is how personality factors into the study of Human Factors.

Pilot Error vs. Human Error: a first-time student pilot will make numerous pilot errors. A well trained, certified pilot will seldom make a pilot error; but the potential for Human Error remains equal for both

Pilot and Controller mistakes arise from human factors that are common among all.

Internally generated thought can block out simultaneously generated externally generated information. PARIS

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§ THE SPRING
(This is often mistakenly read as “Paris in the spring.”)

The most notable characteristic of successful flyers and controllers is their absolute faith in themselves.

THE STROOP TEST (can be taken on the internet)

OBSERVATIONS - This test demonstrates our mental vitality and flexibility. We can read faster than we can name colors.

To perform well in this experiment, we must rely on the mechanism referred to as **INHIBITION**. We must inhibit—or stop—one response to an outside stimulus to say or do something else. Some things that we can do easily and/or automatically **INTERFERE** with the activities that require more effort to comprehend and/or execute.

The more fatigued one is, the more difficult it is to overcome this limitation.

BOTTOM LINE: If there are 2 (or more) opposing/conflicting cues (external stimuli), we will more likely choose the automatic (easy) one.

How well do you resist outside interference?

How good is your ability to cope with cognitive stress and to process complex input or output situations?

FINAL THOUGHTS

In order to identify all of the human factors that can or have led to errors by pilots or controllers, there needs to be a willingness on the part of the aviator and controller to “come clean” on the issue/error at hand. And this will only be profitable if the person has good self-esteem and self-knowledge with no agenda to hold back. Self-knowledge usually only comes later in life; but because we have been born and raised in such an “unforgiving” environment - disciplined for misbehavior, poor grades in school, demotion or dismissal - we have become skillful in disguising our weaknesses and have lost sight of them by overcompensating with our strengths.

There are some negative aspects of “group thinking” –

Peer Pressure – pressure exerted by the majority upon the individual who expresses doubt or who does not support the opinion of the majority.

Time Pressure – time is more important than the task.

Self-censorship – keeping silent concerning our own misgivings about the team’s activity.

Unanimity – if we all are in agreement, we must be right.

Incursion Prevention Technique #3

A controller doesn't have to work in a facility very long before voices of some aircraft or vehicle operators become familiar to the controller - and vice versa. This familiarity results in expectations between the operators at both ends of the microphone. For example, a particular voice may result in a sense of heightened alertness on the part of the ground controller if past performances by this customer warrant special attention. On the other hand, a historically professional performance by a familiar voice may instill a false sense of confidence in the controller who expects another flawless performance by this customer. The latter of these two conclusions by Air Traffic Control (ATC) is not without its risks

Many airline companies as well as other commercial and corporate aircraft operators "import" Aircraft Maintenance Technicians (AMT's) on an as needed basis from locations across the country, and even the globe for that matter. And although these technicians are taxi-qualified and sound very professional, they may have never been on your airport before. The air traffic controller's familiarity with the tail number and the daily routine of a particular operator – regardless of the voice – may also promote a casual confidence within the controller that is unwise. Numerous interviews with experienced technicians indicate that they know the routine and how to manage their radio to pose the least amount of impact on the ground control frequency. They would just like ATC to know that they may not be as familiar with your turf as you might think they are.

Recently, airline pilots have also told us that they can also be caught in the "familiarity trap," especially at hub airports. A crew that is domiciled in the Western USA hub of a particular air carrier may seldom pass through the hub in the Eastern USA. Yet, ATC will assume that every crew of a locally dominant carrier is very familiar with the local drill and the lay of the land, when just the opposite may be true. This is especially prevalent during the final days of the month when the reserve crews are replacing the line crews who have reached their maximum hours for the month.

The Bottom Line...

Communication shortcuts with local customers are convenient tools, but there can be two drawbacks: (1) the customer may not possess the airport or procedural familiarity that ATC anticipated; and (2) the situational awareness of all other customers on the frequency may be somewhat stifled by coded or abbreviated communications that are understood only by a few.

Incursion Prevention Technique #4

Analysis of a recent controller error became quite thorough due to the openness of the employee during the preliminary investigation. The scenario was ripe with the day-to-day stressors that most often result in peak performance by a controller, but sometimes result in a “bad call.”

The Scenario: Controller “A” cleared a departing aircraft into “position and hold” to allow a runway crossing that he had just authorized. But the same controller then issued a take-off clearance just 31 seconds after the crossing began. The crossing was not complete, thus a runway incursion under the heading of an operational error occurred. The departing aircraft observed the conflict long before reaching 25 knots and aborted takeoff.

The Interview: Controller “A” offered the following causes for his error. The crossing aircraft could not be seen because his view was obstructed by a large radar display. He had forgotten the crossing that he had authorized and was in a hurry. The hurried atmosphere was a result of two conditions: the controller had already taken the departing aircraft off of the runway once already, and he was striving to comply with the various flow restrictions (for example, EDCT) miles in trail like fixes.

To categorize the elements of the incident, it breaks down this way: ergonomics (obstructed view), short-term memory loss (forgot), keen sense for timely customer service (had taken the aircraft off the runway once before; making amends), demanding influences (EDCT, flow restrictions, hitting gaps).

The Bottom Line: The decision making process of the ATCS is often complex. It is as crafty as it is vulnerable. The actual safety record of the ATC system is a testimony to the incredible attention to detail that is demonstrated so widely. But the incident detailed above proves that there is always the potential for a singular detail to distort a well balanced and comprehensive thought process. Some detail will seize too much attention and detract from other details that may be equally or more important. There is no sure-proof procedure or personal technique to prevent the loss of a well-balanced “mental” scan during the decision making process. But recognizing our own - or someone else’s - excessive preoccupation with a single detail, may be the sole means of “snapping out of it” and restoring effective situational awareness just in the nick of time.

Incursion Prevention Technique #5

The **Type A** personality is typified as a person who must rush to get things done. They must watch the clock because they are in a race against time. Their work is dependent upon others who must also work in a timely manner. If someone fails to meet this standard, frustration abounds among those impacted. The careless mistakes of others are very irritating because a **Type A** cannot afford the waste of time. A **Type A** individual tries (actually needs) to perform multiple tasks at once. Their goals are immediate and they need to dominate in every situation.

There are **Type A** personalities in every profession. But there are very few professions in which the atmosphere is so adept at transforming a “mild mannered” individual into the super human being known as the **AIR TRAFFIC CONTROLLER**. There is perhaps a higher concentration of these personalities in air traffic control than any other profession. And if not a natural-born **Type A**, the striving for 100% accuracy on the part of every 2152 in the performance of daily duties would lead the casual observer to conclude that the entire ATC workforce is made up of **Type A** individuals. Although the team makeup is truly a diverse one, the team output is greater than the sum of its parts. The personal recognition of each other’s worth adds to the potency of the team and results in a synergy that exceeds expectations.

To be successful as an ATCS, one has to adapt to the environment and to the task of doing things quickly and perfectly. It’s a high speed/high demand atmosphere. Confidence in one’s personal ability is a must. SOP’s are the tools of the trade that free up brainpower, enabling the multi-task controller to perform efficiently. The experienced controller will execute intricate tasks instinctively. But herein is both the strength and weakness of this **Type A** personality. The accuracy of the work produced by a **Type A** individual is dependent upon an appropriate level of arousal. And this “appropriate” arousal level fluctuates within the individual in frequent and random patterns. We don’t know what causes arousal to dance around as it does; we only know the results. If one becomes overly stimulated, distractions – either internal or external – will cause mistakes such as hearback/readback errors. At the other end of the arousal spectrum is the lethargic or indifferent performer who has not “spooled up” for the task. This condition will often result in poor situational awareness and the lack of positive control.

One would do well to remember that we only brought our raw materials to the hiring table. The system and the training process turned us into the valuable resource that we’ve become. And we’ve been rewarded with an adequate and reliable income for the service we are now capable of providing. There is a tendency of **Type A** individuals that negatively impacts their usefulness. Arrogance has no redeemable value. Worse yet, it has the ability to dissipate the effectiveness of the other useful attributes of the **Type A**. Arrogance will surface as one begins to see themselves as the father of their skills and their affluence, when in reality we were endowed with these refinements as a result of the training efforts and benevolence of others. The undesirable result of

arrogance is that we are no longer open to the advice or assistance that others around us are equipped to offer. The team concept erodes when we do not value the person beside us or behind us as much as we value ourselves. **The National Airspace System is a team that runs coast to coast.** The glory hound negatively impacts the entire team. Arrogance is not something that people strive to achieve. It's something that overtakes us from within. Be alert for the ambush; it's sure to surface.

Type A performances by team players are the formula for the "**A Team**" in every facility.

Incursion Prevention Technique #6

Transport Canada and NAV CANADA created an incursion-prevention committee that provided recommendations for the prevention of incursions by air traffic controllers. Due to heightened awareness among controllers and more accurately reporting airport incidents, there was an increase of incursions over a 4-year period from 60 to 279. But due to the performance improvement emphasis within the controller workforce, ATC errors only increased by 4 over the same period. So whereas the 28 controller errors made up a 46% contribution to the 60 incursions reported in the first year of the campaign, ATC only contributed 32—or 11 percent—of the 279 incursions in year 4. Senior management in NAV CANADA reports that the secret to this success can be attributed to emphasizing the following activities during annual ATCS recurrent training:

The pilot readback – Many runway incursions involved the incorrect or missing read backs of hold-short instructions. Obtaining a read back of any hold or hold-short clearance is mandatory.

Ground taxi – Make taxi clearances concise the first time. Provide details that will eliminate confusion or the possibility of pilot error, and then stay out of the cockpit and let the pilot execute the clearance. Pilots are busy, and ATC has the vantage point for catching pilot errors if necessary.

Use of memory aids – Controllers have strips, lights and other memory joggers as well as more advanced technology in some locations. Address the consistent and accurate use of these devices during recurrent training.

Use of position relief checklists – Emphasizing the thoroughness of the position relief briefing cannot be overstated nor over-implemented. Poor practices in this area have surfaced in controller errors more often than had been anticipated.

Scanning techniques – Proper scanning is best defined as the entire tower team vigilantly browsing the entire airport surface, the final approach courses of all runways—active and inactive—and the visible celestial dome.

Are you disappointed that you did not see anything new? As has always been recited, “there is no silver bullet that will effectively reduce controller (or pilot) error.” Can these familiar keys to success have the some dramatic results in the FAA? They will if we also adopt the necessary thrust behind them. Supervisors and management must consistently evaluate performance against this standard. Controller reaction to these keys must move beyond the polite endorsement of them as essential tools to a sustained focus on the topics that these mini-bullets above summarize.

Incursion Prevention Technique #7

This edition is short on substance in support of the topic above, but it may prove informative to some. The CPC has the knack for taking a revelation or a new experience and making appropriate and effective adjustments to his/her personal technique.

Airbus and Boeing aircraft, like many others, have performance characteristics that vary considerably, especially on final approach. Most notable to the tower controller would be the ability to execute a go-around. A Boeing may be able to execute a go-around more quickly than an Airbus. Pilot proficiency and appropriate cockpit resource management regimens make these differences transparent to the air traffic controller. But the difference could become dramatically obvious during a short final, ATC-initiated go-around. The lowest elevation from which a Boeing could execute a safe go-around will more likely result in a touch-and-go for the Airbus. This is due to the differences in the inherent lag time attributed to aircraft design and engine performance.

Did you know that the FAR requires the mechanic (AMT) of a commercial airline to establish two-way communications with ATC prior to performing any engine run-up? One of the reasons for this regulation is to ensure that the AMT is linked with the fastest means of activating an Alert in response to an engine fire. There is no faster means of rolling the equipment than the tower crash phone. So when an AMT calls Ground for a radio check, it's not just for convenience.

Commercial pilots continually request that Runway Safety Office personnel remind ATC to keep two-way communication to a minimum during critical phases of flight such as between the outer marker and a runway rollout speed in excess of 60 knots. In addition to intra-cockpit communications and responsibilities, pilots may also need to perform an internal "hand-off" of the aircraft from one pilot to the other just prior to the runway turn-off. If essential or tactical information must be conveyed to a crew before reaching a speed of 60 knots or less, prefacing the information with "you need not acknowledge..." will keep distractions to a minimum.

Try to recall the last episode of rage that overcame you. Perhaps it occurred when some careless or ruthless driver jeopardized your safety. Could you truthfully say that you remained clear-headed, though angered or did you become the "warrior avenger"? It is most likely that you required several minutes and miles to regain your composure. Insults induce anger. Pilots who become victims of perceived bullying by ATC become no less agitated. How precisely will an irritated pilot execute ATC instructions while involved in complex tasks? When this senseless risk is introduced into a cockpit, the pilot is then called upon to add anger management to his/her list of priorities. Until otherwise brought under control, anger—and its contaminating affect—dominates an environment. The necessity of assertiveness by ATC should not be allowed to erode into belligerence. A professional cadence with a cool demeanor is most constructive.

Incursion Prevention Technique #8

In a Human Factors paper published by the International Airline Transport Association in 1997, the three most common and least manageable triggers in a human error event are INATTENTION, PREOCCUPATION and FORGETFULNESS. Their target audience was the airline pilot. But reflecting upon the ATC operational error that results in a runway incursion, the same three triggers are more likely the culprits than poor controller judgment.

When ATC is at its best, each individual of the tower team is actively engaged in the overall surface movement of traffic. Local and Ground and Cab Coordinator are looking for the opportunities to keep traffic that is in motion moving while taking advantage of the gaps that result in front of stationary or slow-moving traffic. But when a controller is deeply involved in formulating a strategy for making and hitting tight gaps, and reassuring themselves that the strategy is unfolding as planned, PREOCCUPATION can trip up this artist and cause the oversight of a detail that should have been included in the mental scan of that strategy.

INATTENTION has a connotation that some sort of blameworthy behavior or negligence has occurred. The reality is that INATTENTION in a controller or pilot is more often the failure to see, yet acting with reasonable behavior. Behavioral scientists agree that there are limitations to how much humans can observe under certain situations. Sight is often an “unintuitive” element of our perceptual process. We seldom have to give much thought to what we see. But when our perceptive skills become overloaded—or in some cases, when they are under-stimulated—we can experience inattention blindness: we do NOT see things that are plainly in view.

Education will not eradicate the all-too-human tendency for FORGETFULNESS. It does not need to be defined, but it cannot be explained. And there are no sure remedies for this affliction. The only recourse ATC has in dealing with FORGETFULNESS is an ethic called “Compliance PLUS”. By “compliance” we mean performing the task as dictated by regulations and SOP’s. The “PLUS” feature is a combination of the use of facility-wide memory joggers and customized or personalized checklists—usually of a mental variety. Checklists are intended to prevent acts of omission. The simpler they are, the better.

In new training literature the FAA has published for flight instructors, there is a suggested mnemonic device for pilots to use when evaluating the risks of their activity. T.E.A.M. is the mnemonic checklist. It refers to risk management alternatives: TRANSFER, ELIMINATE, ACCEPT, MINIMIZE. Can the risk be Transferred, i.e. to ATC? Can it be Eliminated altogether? Should it be Accepted as is, or Minimized to an acceptable level? Perhaps this device can be of use to ATC while contemplating the reality of the 3 risks above. Because those 3 risks are so personal, in most cases the error-management solution must also be personal.

Incursion Prevention Technique #10

Here are some interesting findings from a scholarly paper entitled *Avenues for Safe and Effective Communications in Air Traffic Control: the Role of Phraseology and Intelligibility*. A total of 65 European air traffic controllers, male and female, participated in a study. They varied in experience from new trainees to employees with more than 10 years of experience. These individuals were asked to listen to 30 real air traffic control communications that varied in phraseology (correct versus incorrect) and in intelligibility (proper speech rate without background distractions). The messages also varied in content: simple ones with only two elements to the more complex ones with up to ten elements. The controllers were asked to listen to the messages of fellow controllers and to reproduce them in writing. Only one chance for listening was provided, a feature particularly common in ATC communications in which an immediate readback and flawless execution is expected. The results of this activity may prove useful in both a personal effort to improve or sustain good clearance delivery techniques as well as a topical emphasis for future periodic evaluations of controllers by the supervisor.

Controller responses were analyzed for their reproduction accuracy of 1) the sequence of the elements, 2) the general content of the reproduction, and 3) omissions. The best results were obtained for intelligible messages regardless of the phraseology used. Messages that contained correct phraseology as the only virtue came in a distant second. Understandably, transmissions that lacked both intelligibility and proper phraseology possessed the most reproduction errors. According to the authors of this paper, the “first implication of these results is the suggestion that intelligibility is the most important variable for communications’ [effectiveness]. The use of correct phraseology on its own is not a guarantee of greater efficacy in terms of communications.”

In another human factors paper that compares the safety cultures of air traffic management and nuclear power plant management in which they offer the best operating practices of each for the consideration of the other, air traffic was offered the following. “[Air traffic] risk assessments ‘compartmentalize’ too much...[not recognizing that] some of our [activities] become ‘someone else’s problem’”. This could boil down to simply saying that letter-perfect delivery may not assure letter-perfect reception. In the numerous Pilot Safety Seminars and Pilot/Controller Forums that are held throughout the nation, pilot comments often surface about controller speech rate.

It is important to remember that letter-perfect delivery is still an element of the controller’s performance standard. But the intended purpose of such precision is easily contaminated by a delivery rate that does not take into consideration the listening skills or workload of the receiver at the other end.

Incursion Prevention Technique #11

Even in heavy traffic situations, the experienced controller can perform many automatic routines without much conscious attention. But seldom an hour goes by when the random dynamics of customer demand require the controller to engage in more complex problem solving to maintain the high safety standards. In such a situation more effort will be devoted to sensing, predicting, coordinating, communicating, executing and monitoring. In either of the above conditions however, human reliability is the key ingredient. Behavior scientists and accident investigators have formulated various outlines for the analysis of a controller error, but they are confounded in their efforts to conduct error prediction. Thus, an effective strategy to accomplish the reduction of operational errors eludes the supervisor and manager.

Reducing controller error—a high priority in the ATO—is entirely dependent upon controller reliability. Early detection of an unfolding error is the best that technology can provide the air traffic management system. But where controllers function as a team, nothing is more effective in assuring controller reliability than a well timed “are you going to be okay right here” from an attentive neighbor at an adjacent position.

Much of a controller’s decision making can be classified as a reasonable risk calculation. Consider the thought process involved in getting maximum use of a runway and minimizing delays. A controller must anticipate the length of a pilot’s landing rollout, the time it will take to clear the runway, and then conclude whether or not there is enough time to get the next departure into position and airborne with the required longitudinal spacing between the departure and the next arrival. Commonly referred to as the “pucker factor”, so much of this calculation is dependent upon the varying performance characteristics of aircraft and even more so upon the diverse skills of pilots. Herein is where the controller is confronted with the risk. Is it reasonable to assume that like aircraft will perform in similar ways regardless of the pilot’s experience level? Will the sound of a pilot’s voice create an accurate perception on the part of the controller as to the pilot’s proficiency level and/or situational awareness? More often than not these calculations are “right on”. The performance standard for ATC requires human reliability 100% of the time. Science says that this standard can never be achieved and the ATC record reveals that it never has been. What can the supervisor and manager do to reduce controller errors?

Much has been written about “Groupthink” and the negative symptoms and some of the solutions of this social behavior. There are several points that aptly describe the character of a controller team that could erode into a risk. The illusion of invulnerability could cause some members to ignore obvious dangers and take extreme risks. The successes of a good team can sometimes lead to inherent morality, rationalization and stereotyping. When a team is confident that their way is best, that other teams’ methods are inferior to their own and when they are unrelenting in their defense of their actions, it may take a strong, patient leader to persuade them to consider the input of

others. Self-censorship arises when a member withholds their dissent or a timely intervention. This person is plagued by the consensus of the team, concluding that if so many others are convinced all is well, the lone dissenter could be mistaken. The leader of a well functioning team must remain impartial and allow space for the dissenter within the group to be considered.

The apparent correlation between rising traffic volume and rising ATC errors is only coincidental. Analysis of errors indicates that errors occur more often in the routine and lighter-than-normal traffic situations. But the ongoing success of the air traffic management system is inseparable from human reliability. Just as redundancy is built into NAS equipment for the purpose of sustaining system reliability in excess of 99%, sustaining an atmosphere that fosters an ever-vigilant team is the sole management tool for improving the human reliability factor in ATC.