Testimony of

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Before the House Transportation and Infrastructure Committee

Subcommittee on Aviation

Wednesday, June 11, 2008

Air Traffic Control Facility Staffing

Executive Summary

The dramatic loss of air traffic controllers since the Federal Aviation Administration's (FAA) Sept. 3, 2006 imposition of work and pay rules on the controller workforce has produced a ripple effect throughout the entire air traffic system. Rampant understaffing has caused a significant increase in controller workload and a subsequent need to increase the use of overtime, resulting in a dangerous and unsustainable rise in controller fatigue. The shortage of controllers is noticeable in the increased time on position, decreased opportunities for rest and recovery both during and between shifts, decreased availability of radar assistants, and increased frequency of position combining; all of these factors are contributory to air traffic controller fatigue.

The FAA has attempted to remedy this situation by radically increasing its hiring. However, hiring alone will not alleviate the situation, as it ignores the value of experience as well as the time and burden of training replacements on veteran controllers. The system has lost over 40,000 years of experience since the beginning of FY 2007 and the total number of fully certified controllers left on board has fallen to a 16-year low. The imposed work rules have hastened the decision to retire for many veteran controllers. Nearly 98 percent of retirees since the beginning of FY 2007 left before reaching the mandatory retirement age of 56 and 44 percent of FY 2007 retirees left within their first year of eligibility. The National Airspace System is increasingly reliant upon inexperienced controllers.

Understaffing, and the related fatigue and influx of inexperience into the workforce, has had a dramatic and detrimental impact on controller training. With nearly one-fourth of the current workforce in training nationwide, and many facilities well exceeding that threshold, there is often not enough time or fully-certified controllers to provide adequate training to all those that require it. Trainees (developmentals) often sit in limbo, forced to wait as much as 18 months at a facility before receiving the necessary on-the-job training (OJT) to obtain certification. Trainees are often called upon to work live traffic before completing training, slowing their training still further.

All of these factors have led to a dramatic increase in both operational errors and system delays. The FAA is currently 17 percent over its own performance limit for serious errors and runway incursions are up 45 percent over last year. Delays have increased 18 percent from FY 2006 to FY 2007 despite a traffic increase of only 0.2 percent. The declines in both safety and efficiency trace back to an unprecedented rate of air traffic controller attrition and widespread controller understaffing, manifest in errors made by developmentals working solo, errors during OJT, and controller fatigue.

In order to relieve the burden that understaffing places on our air traffic controller workforce and the entire national airspace system, the National Air Traffic Controllers Association (NATCA) recommends the following:

- **The FAA must remove push factors motivating experienced controllers to leave the workforce by removing the imposed work rules and negotiating with NATCA on a mutually agreeable contract which controllers can ratify.**

- **The FAA must work with NATCA and the National Academy of Sciences, or another independent third party, to reestablish scientifically-based staffing standards for each FAA air traffic control facility.**
- **The FAA must work with NATCA and the National Academy of Sciences, or another independent third party, to establish concrete limits on trainee ratios at the facility level. These ratios, along with the current Trainee/Certified Professional Controller breakdown of the workforce by facility, must be published in the FAA's annual workforce report.**
- **The FAA must negotiate with NATCA to reach a contract that would reinstitute a career ladder that encourages movement by experienced controllers into more complex facilities.**
- **In order to avoid such crises in the future, the FAA and NATCA must work collaboratively on all issues affecting air traffic controllers or their operations.**

Background

In 2002, the Government Accountability Office (GAO) warned the Federal Aviation Administration (FAA) that it must prepare for a wave of controller attrition as those hired following the Professional Air Traffic Controllers Organization (PATCO) firings in 1981 reached the age of retirement eligibility. Rather than heed the warnings of the GAO and begin hiring in preparation, the FAA first ignored the situation and then worsened it.

The National Air Traffic Controllers Association (NATCA) and the FAA began contract negotiations in July 2005 over a successor agreement to the 2003 extension to the parties' 1998 collective bargaining agreement. The FAA unilaterally declared an impasse after only nine months of negotiations.

To NATCA, it became clear during the negotiations process that the FAA planned to exploit a clause in Title 49 United States Code, through an incorrect and logically contrived reading of the statute, to unilaterally impose its proposals on America's 14,000 air traffic controllers, essentially stripping this union of its collective bargaining rights.

The imposed work rules ushered in a dramatic decline in the working lives of air traffic controllers. They have and continue to suffer increased workload, decreased rest periods, loss of leave flexibility, removal of career advancement opportunities, pay cuts, and a variety of minor indignities that have created an unsatisfactory work environment. This, during the period of increased retirement eligibility against which the GAO warned, has brought about unprecedented levels of attrition. The vast majority of those that have separated had not yet reached the mandatory retirement of age 56.

Scope of the Air Traffic Controller Shortage

As of March 31, 2008, there were 11,164 Certified Professional Controllers (CPCs) working at Federal Aviation Administration (FAA) facilities, the lowest number in 16 years. The situation

is bad and getting worse, as controllers continue to flee the workforce at an unprecedented rate. 1,622 controllers left the FAA workforce during FY 2007, and 960 left in the first six months of FY 2008. There are 996 fewer CPCs today than there were before the imposed work rules and 1,637 lower than the high point in 2002[1]. There is no question that we are in the midst of what can only be described as a crisis in air traffic controller staffing.

In 1998 the FAA and the National Air Traffic Controllers Association (NATCA) agreed upon the optimal number of controllers for each facility based on a scientific formula derived from time-and-motion studies, sector complexity and workload, number of operations on the 90th percentile day, and relevant non-operational activities (i.e. training, annual/sick leave). Although the number of operations is similar to that of 1998[2] and relevant technological changes have been negligible, the FAA has abandoned these standards in favor of new staffing ranges which dilute the scientific data by averaging them with current staffing (comparisons to peer facilities suffering the same staffing shortage), past staffing lows (by defining "highest productivity" as the greatest number of operations per controller)[3] and "service unit input" which did not include NATCA. The result of this new calculation is that, although the air traffic system is operating within the FAA's flawed staffing ranges, the system is operating with only 71 percent of the number of controllers authorized in 1998.[4]

The situation is particularly dire at facilities in certain major metropolitan areas whose economic well-being depends heavily on air travel for business and tourism. During the past six months, controllers at Atlanta, Chicago, New York, Dallas, and Northern and Southern California have declared staffing emergencies for their regions, asserting their concern that understaffing would have a severe impact on operations in those areas.

In New York, for example, staffing at each of the three major metropolitan area towers are at 66.7 percent (LGA), 67.5 percent (EWR), and 72.9 percent (JFK), while New York Terminal Radar Approach Control (TRACON) is at 66.3 percent and New York Air Route Traffic Control Center (ARTCC) is at 62.2 percent of authorized staff levels[5].

The situation in New York is not unique. The graphs on the following pages depict staffing levels at each of the major towers, En Route Centers, and TRACONs.

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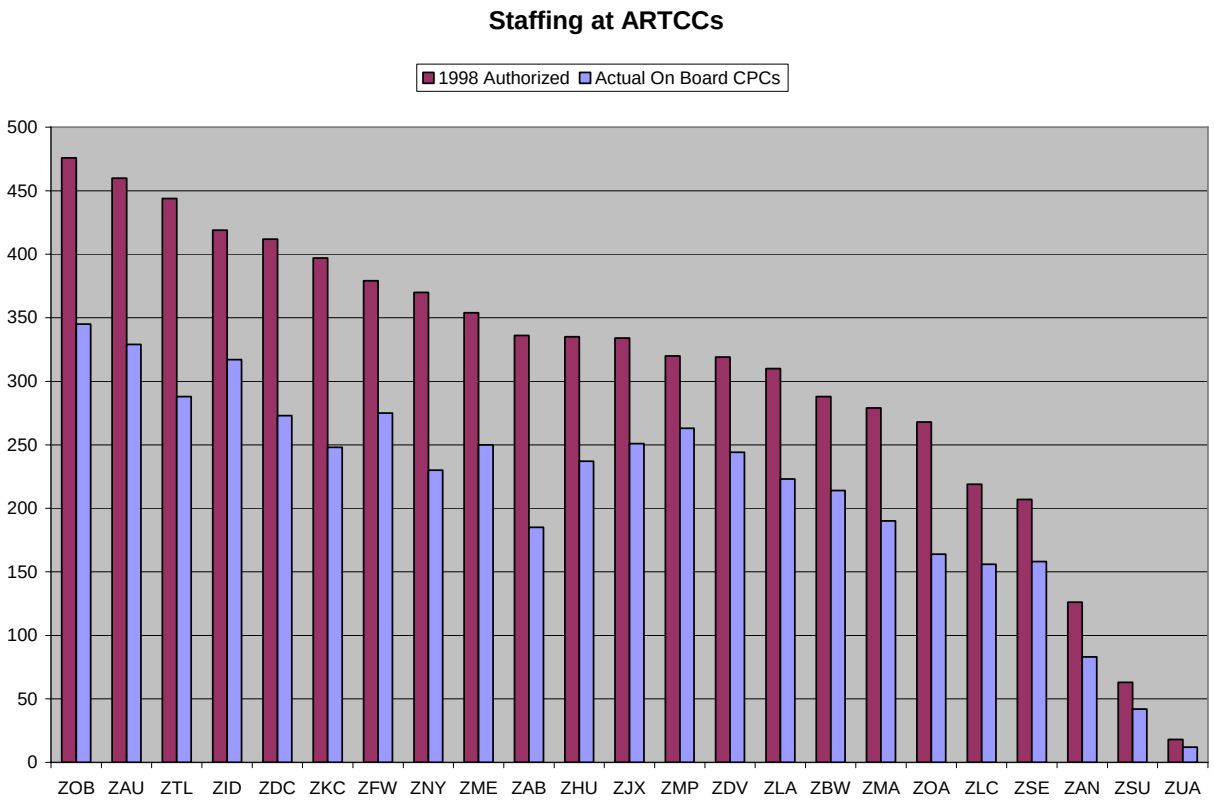
[1] Based on payroll data provided to NATCA by the FAA. Current as of 3/31/2008

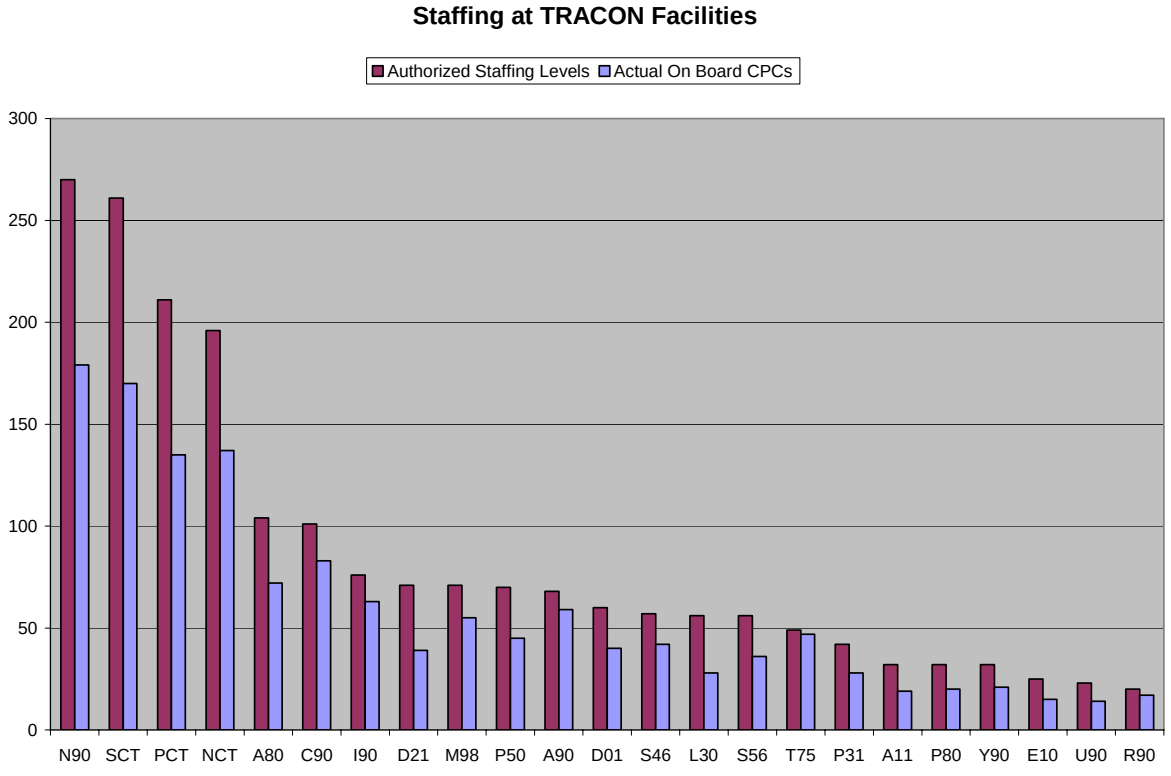
[2] According to the FAA's OPSNET database there were 45,394,027 instrument operations in FY2007 compared to 48,985,472 in FY1998 (93%).

[3] Federal Aviation Administration, "A Plan For the Future: 2007-2016" March 2007

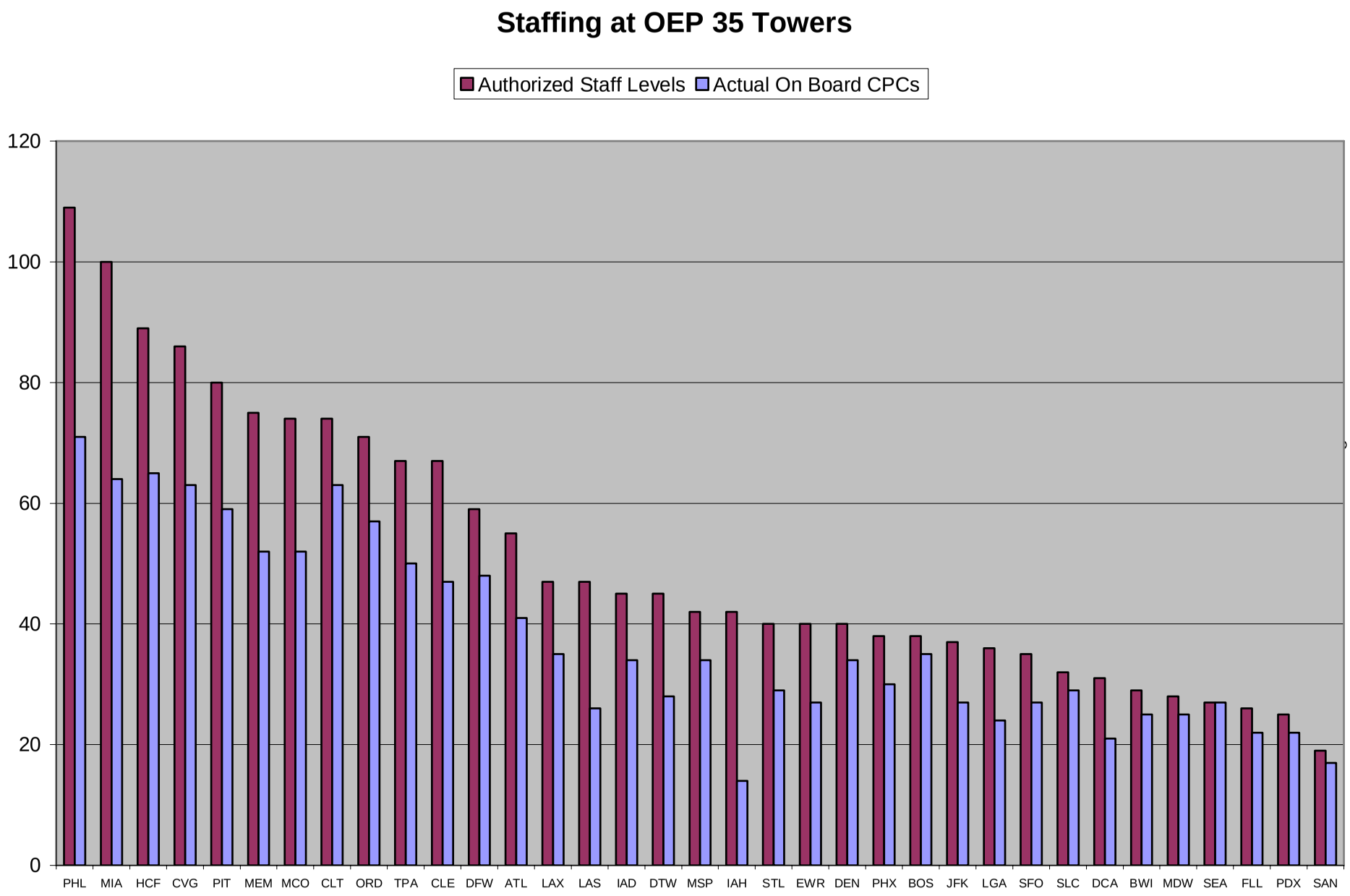
[4] Although the staffing levels authorized in 1998 do not exclude developmentals, at the time the contract was signed, developmentals in the system accounted for less than 10 percent of the authorized levels. No one at that time predicted that the number of trainees in the system would come to make up a significant portion of the workforce or that uncertified controllers would work large amounts of air traffic.

[5] Based on payroll data provided to NATCA by the FAA.





Staffing at ARTCCs and TRACONs is well below the authorized and scientifically-based staffing standard.



Staffing at these OEP 35 airports is well below the authorized and scientifically-based staffing standard.

The Origin of Understaffing: Unprecedented Levels of Air Traffic Controller attrition

In order to fully grasp the issue of air traffic controller understaffing and devise effective solutions, it is crucial to understand the origin of the understaffing problem. In its most recent workforce report, the FAA writes, "Fiscal Year 2007 was long projected to be a peak year for retirements of controllers hired in the years following the strike of 1981."[6] In this document and others, the FAA implies that the recent attrition is the natural outcome of an earlier hiring wave, and that the agency is fully in control of the situation. Neither could be further from the truth.

While the hiring wave that followed President Reagan's mass-firing of air traffic controllers in 1981 has created a rise in controller retirement eligibility, what we are currently experiencing cannot be explained by this alone. In 2002, the Government Accountability Office (GAO) conducted a study on air traffic controller attrition and warned the FAA of a potential future shortage of air traffic controllers. In this study, the GAO predicted that the same year, 2002, would be the peak for air traffic controller attrition, and that attrition would never exceed 4.4 percent of the workforce and that by 2007 attrition would have decreased to approximately 700, or 3.7 percent of the workforce[7]. The FAA predicted in June of 2006 that there would be 950 losses in FY 2007[8].

What actually occurred was an unprecedented 1,622 losses due to attrition in FY 2007. This number represents 8.7 percent of the year-end workforce, more than doubling GAO predictions in both raw numbers and percentages while shattering FAA predictions made only the previous year. Of these 1,622 losses, only 17 were mandatory retirements. In contrast, 894 retired before reaching their mandatory retirement age and an additional 200 resigned their FAA positions before reaching retirement eligibility.[9]

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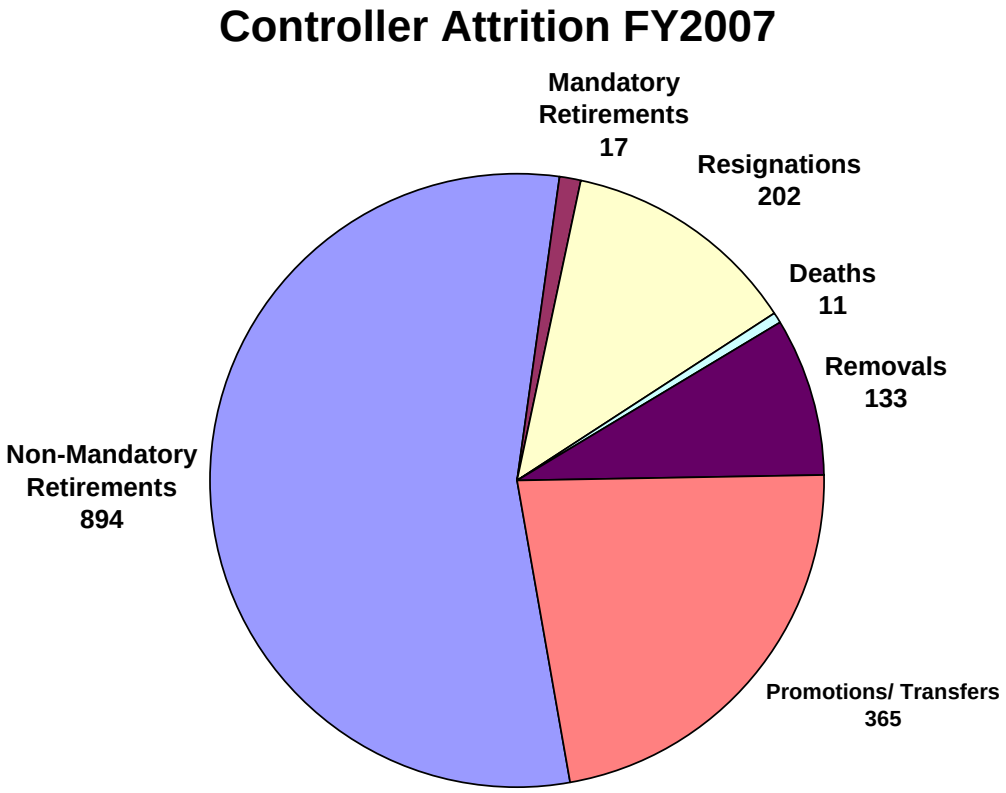
[6] Federal Aviation Administration, *A Plan for the Future: The Federal Aviation Administration's 10 Year Strategy for the Air Traffic Control Workforce 2008-2017*

[7] Source: 2002 GAO report entitled *Air Traffic Control: FAA Needs to Better Prepare for Impending Wave of Controller Attrition*

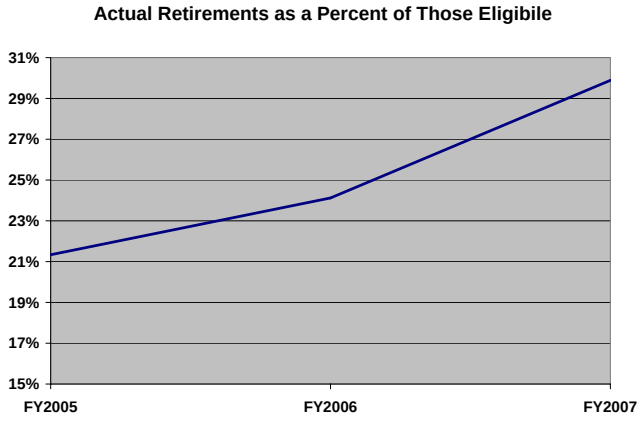
[8] Federal Aviation Administration "A Plan for the Future: 2006-2015"

[9] Based on payroll data provided to NATCA by the FAA.



The vast majority of the attrition we are experiencing is not due not to mandatory retirements but due to individuals opting to leave the workforce[10]

Both high attrition rates and high incidence of voluntary attrition have continued into this fiscal year. As of March 31st, 960 controllers have left the FAA workforce (including promotions and transfers) in FY 2008, a staggering 4.5 per day. Of those that left, only 1.3 percent did so because they had reached the mandatory retirement age; 15 percent resigned from the workforce without even being eligible to retire. The percent of retirement-eligible controllers who choose to leave has also increased significantly since the work rules were imposed.



[10] Based on data provided to NATCA by the FAA.

The percentage of people making the decision to retire has increased significantly since the work rules were imposed.[11]

The breakdown of attrition suggests that we must not only look at ways to repopulate the air traffic control workforce, but that we must also take steps to eliminate the "push" factors that continue to motivate the attrition of experienced controllers.

These push factors can be easily traced to the FAA's unilateral implementation upon the air traffic controller workforce a new set of work and pay rules by circumventing the collective bargaining process. These rules removed career advancement opportunities, established new pay bands that decreased controller wages considerably, reduced the availability and duration of rest periods, instituted unpopular changes to the annual leave policy, and created an adverse work environment.

Veteran controllers who are eligible to retire have, because of the new pay bands, already worked their three highest salary years that will determine their pensions. Combined with the deterioration of working conditions and a more acute fear of errors due to increased workload, all incentives for experienced controllers to stay on board until their mandatory retirement age have been removed.

One former controller summed up the sentiments of many in his resignation letter to the FAA:

> Under the FAA's new imposed work rules I cannot justify staying with the agency… I do not feel I can continue to work in an environment that is so vindictive, or for an employer who is more worried about the bottom line rather than safety. I cannot justify staying when I can return to a company that knows how and makes it a point to take care of its employees. My take home pay will go up, my quality of life will improve and my workload will decrease.[12]

What We Lose: The Value of Experience

The Federal Aviation Administration (FAA) continually assures Congress and other stakeholders that the Agency's aggressive hiring practices have negated the effect of attrition. According to its 2008 staffing plan, the FAA claims to have hired 1,815 "new controllers" in FY 2007 "to compensate for increased losses." The hiring of trainees, however, cannot make up for the loss of experienced controllers. Since the beginning of FY 2007, we have lost more than 40,000 years worth of experience[13].

The value of experience in this field is immeasurable, particularly during an era in which the training of the next generation of air traffic controllers plays such a central role. Study after study has shown that job experience is positively correlated with performance, largely because of

[11]Eligibility data based on data in workforce plans from 2005, 2006 & 2007. Actual retirement data for FY 2005 and FY 2006 from the 2006 and 2007 workforce plans, FY 2007 retirement data obtained by NATCA from the FAA.
[12] Employee resigned from Albuquerque ARTCC, in October 2006.
[13] Calculated based on FAA payroll data provided by the Agency to the Union.

the amount of knowledge one acquires over years on the job[14]. For air traffic controllers, experience means the ability to reflexively guide aircraft through routine operations without having to puzzle through each aspect of the procedure. It means that for everyday operations, safety is second nature and efficiency can become a priority. It means having seen and worked through a wide variety of unusual circumstances and the development of enhanced problem solving skills. It means being able to react easily to a change in circumstance by, for example, creating holding patterns on-the-fly or altering a rout to avoid a turbulent ride. It means understanding how one's own actions effect operations in neighboring airspace. It is this experience, knowledge and ability that we are losing and that cannot be replaced by simply hiring new trainees.

The continuing exodus of veteran controllers forces the National Airspace System to rely on increasingly inexperienced controllers to conduct training. The ratio of trainees is increasing and the most experienced Certified Professional Controllers (CPCs) are retiring, forcing us to tap into greener controllers to conduct training. One controller from the Southern California TRACON reports being asked to give official training on flight data while he was still in training himself. New controllers, even those who have achieved full performance level, have not yet acquired the same job knowledge, skills and abilities as those of their more experienced counterparts. As such, they are less able to pass such knowledge on to the trainees in their charge, decreasing the effectiveness of training and the readiness of the workforce.

The Reality of Training: High Trainee Ratios and Inadequate Infrastructure

It is important to recognize that new hires do not enter the workforce capable of working air traffic. Before they can do so, they must undergo a rigorous training process that typically takes three to five years to complete, as long as it takes for many to receive a college education. In order to maintain the safe and smooth operation of the air traffic system, the FAA would have had to act with foresight and increase hiring rates several years prior to the expected rise in attrition. The FAA was negligent in this regard.

Prior to 2005, Federal Aviation Administration (FAA) hiring was nearly non-existent; in 2004, the FAA hired 13 new trainees. Of those hired since 2005, only 538– 10 percent – have yet been able to achieve full certification. In that same period of time, we have lost 2,000 veteran controllers to retirement.

The FAA also underestimates the time it will take these new hires to reach full performance level. Although the Agency estimates that it now takes only two to three years to reach certification, only 50 percent hired in FY 2005 have become Certified Professional Controllers (CPCs), indicating that a majority of trainees need more than three years to reach CPC level. Although the FAA has claimed that innovations in training will reduce the necessary training time, experience in the field has not supported this notion. A combination of less prepared trainees entering the facilities and high trainee ratios has slowed down the training process for

[14] Quinones, Miguel, J. Kevin Ford, Mark Teachout "The Relationship Between Work Experience and Job Performance: A Conceptual and Meta-Analytic Review", *Personnel Psychology* 1995 v. 48.

many developmentals. Of those hired during FY 2007, 85 percent are still in training, 42 percent have not progressed beyond the academy graduate level.

	FY 2005	FY 2006	FY 2007	FY 2008	4 Year Total
Total Hired for FY	519	1116	1815	1877*	**5327**
CPC	166	215	153	4	538
CPC-IT	2	6	5	0	13
Third Developmental Level (D3)	62	167	182	12	423
Second Developmental Level (D2)	78	452	338	12	880
First Developmental Level (D1)	11	134	261	11	417
Academy Graduate	2	56	758	486	1302
Total Hired and still on Board	321	1030	1697	525	**3573**
Total Hired and Still in Training	155	815	1544	521	**3035**
Total Hired and Certified	166	215	153	4	**538**

*FAA Summer 2008 Planned hires vs AOB March 31, 2008

In its 2006 workforce report, the FAA made the following statement which was conspicuously absent from the most recent reports.

> "To reduce the on-the-job portion of facility training, developmentals need continuous, uninterrupted access to facility training opportunities and resources. However, management practices within the operational environment can have a detrimental effect on these opportunities and may greatly extend this time-to-certification. These practices include, but are not limited to, *canceling or delaying OJT [On the Job Training] to use developmentals to work positions they were previously certified on,* as staffing backup behind, spot leave, annual leave, work group assignments and a variety of other activities that remove CPCs from the operational environment."

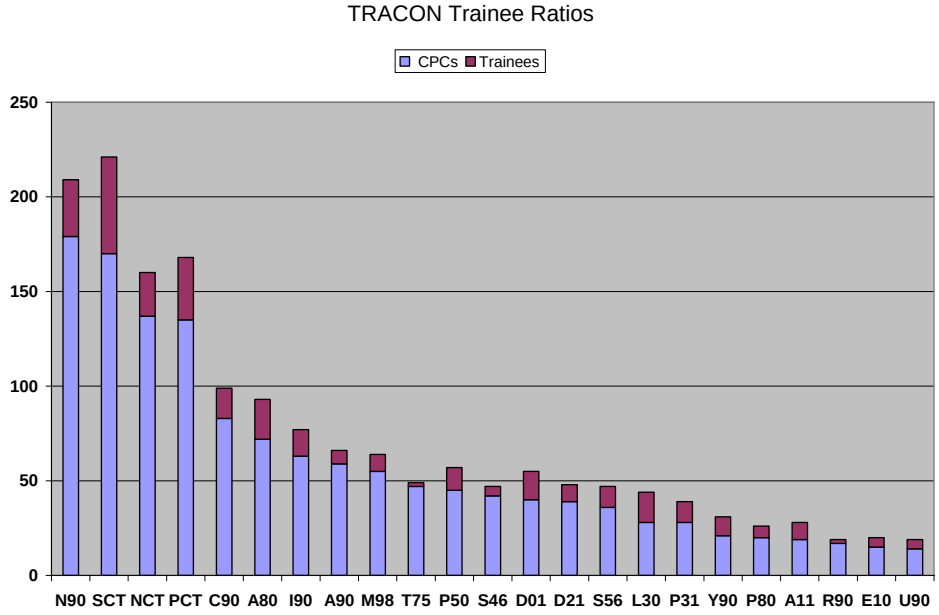
Instead of accelerating training by allowing developmentals uninterrupted access to on-the-job training (OJT) opportunities, the FAA is relying heavily on developmentals to work traffic. As it states in the 2008 workforce report, "these position qualified controllers are the focus of our staffing to traffic efforts."

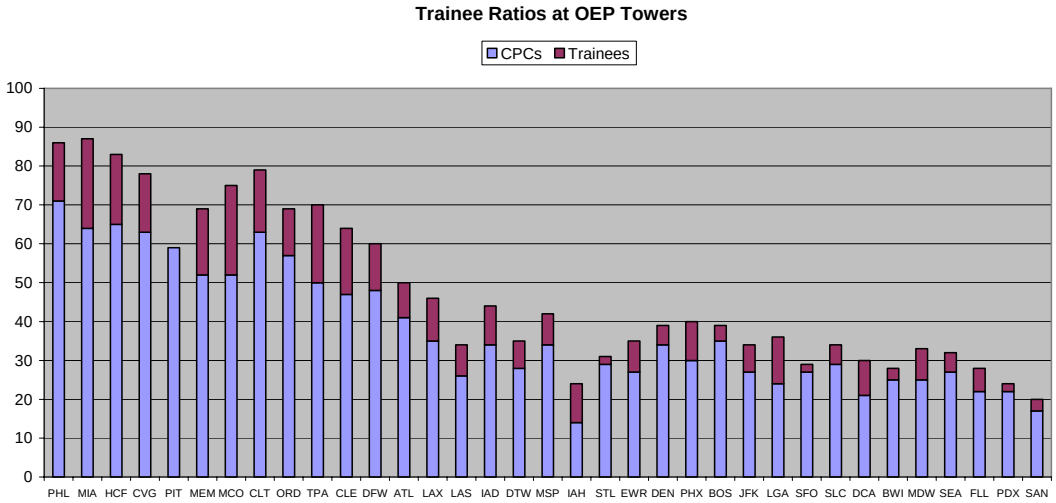
It has become necessary to rely on developmentals to work traffic because of the high and rising ratio of developmentals to the total workforce. As of March 31st, nearly one-fourth (23.3 percent) of the workforce was still in training. Of those developmentals, 38.4 percent are not yet permitted to work traffic on their own at any position. Although it has backpedaled on this statement in its most recent workforce report, in the past the FAA has held that the air traffic system can only safely and efficiently handle a workforce of 35 percent developmentals.[15] The Inspector General of the Department of Transportation has recently indicated that even this may be too high a percentage. In a recent document it reported, "Many facility managers, training officers, and union officials we spoke with disagreed with the FAA's estimate of an acceptable

[15] Department of Transportation Inspector General Report AV-2007-032, "FAA Continues To Make Progress In Implementing Its Controller Workforce Plan, But Further Efforts Are Needed In Several Key Areas" 9 February 2007 pg 13.

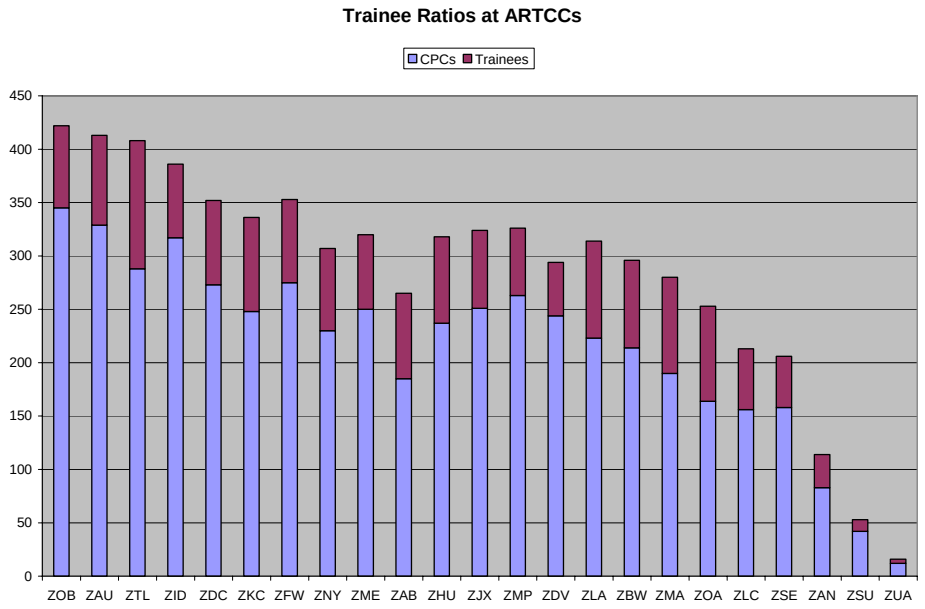
level of developmental controllers. It stated that, in order to achieve effective controller training while maintaining daily operations, the *maximum* percentage of developmental controllers should be limited to between 20 percent and 25 percent of a facility's total controller workforce."[16]

As of March 31st, forty-four air traffic facilities exceed 35 percent developmental ratio – double that of just three years ago – and 126 facilities exceed 25 percent. Even some major high-traffic facilities have exceedingly high developmental ratios. Las Vegas TRACON, Oakland Center, and Teterboro Tower all exceed 35 percent trainees.





[16] Statement made by Calvin L Scovel III, Inspector General, US Department of Transportation before The Senate Committee on Appropriations Subcommittee on Transportation, Housing and Urban Development, and Related Agencies 17 Apr 2008 " Key Safety and Modernization Challenges Facing the Federal Aviation Administration"



Trainees make up nearly ¼ of the workforce at most major facilities

Although OJT is an integral part of preparing the next generation of air traffic controllers, training itself adds a level of complexity to Air Traffic Control operations. During OJT, a trainee works live air traffic, while a CPC monitors both the trainee's actions and the radar. The CPC is held responsible for any errors made by the trainee. This combination of inexperience and complexity increases the likelihood of errors, while the increased workload for CPCs contributes to fatigue. Additionally, the high ratio of trainees also contributes to delays as the least experienced of controllers are least adept at quickly moving aircraft and more likely to increase the margin of separation to maintain safety.

Staffing shortages and high trainee ratios also have a direct effect on the efficiency of training itself. With so many trainees, and a small and shrinking number of CPCs, there are a limited number of controllers capable of providing training. These CPCs are also responsible for working the majority of air traffic and in many cases there simply aren't enough people to conduct training. In addition, when trainees make up such a large percentage of the workforce, facilities must frequently rely upon those certified to work particular positions to do so, thereby limiting their opportunities to receive OJT. At Miami Center, for example, trainees have had to wait up to sixteen months from their date of hire to receive OJT[17] due to the facility's staffing shortage.

The preparedness of the trainees entering the facility has also decreased as a result of the staffing shortage. The FAA's need for new hires has exceeded the number of individuals available from Collegiate Training Initiative (CTI) schools or the military, traditionally the two biggest air traffic control recruiting pools for the Agency. The FAA has therefore had to turn to the general public to fill the gap, recruiting through venues like Craigslist and Facebook. The general public

[17] Interview with facility representative from ZMA

requires greater amounts of training on air traffic control basics than do its CTI or military counterparts.

For the first time since the 1980s, trainees are being put directly into some of the most demanding and difficult terminal facilities after completing their classroom training at Oklahoma City. These facilities include Atlanta Hartsfield Jackson Tower (ATL), Atlanta TRACON (A80), Charlotte Tower (CLT), New York TRACON (N90), Dallas-Fort Worth Tower (DFW), San Francisco Tower (SFO), Southern California TRACON (SCT), and Northern California TRACON (NCT).

In the past, terminal trainees were placed in a lower-level tower to receive initial certification and would transfer to a higher-level facility as their careers and skills advanced. Higher level facilities had neither the curricula nor the training to teach new hires aircraft types, airline identification and other basic fundamental air traffic control knowledge and skills. The imposed work rules, however, removed financial incentives for experienced controllers to transfer to more difficult facilities because many would actually take a pay cut with such a transfer. With the staffing shortage and the removal of the career ladder, these facilities have had no choice but to turn directly to the academy for new hires. One exasperated trainer recently described his situation, saying, "For the first time, I was teaching a trainee who didn't know the difference between a regional jet and an MD80." Naturally, these developmentals require increased training time.

While high-level FAA officials tout improvements in the training system and claim that they decrease the necessary training time, in the field even management recognizes that this is not the case. In New York TRACON for example, management issued a notice in March of this year increasing the number training hours allotted for certification on nearly half of the positions in the Kennedy Area (the rest were unchanged), indicating that the FAA has not been able to increase the pace of certification.

The FAA, in short, is burning the candle at both ends when it comes to training. It is hiring a large number of trainees, with less background, relying upon them to work greater amounts of traffic, and expecting them to certify more quickly. All of this is expected to be accomplished with a certified controller workforce already stretched to the limit and continuing to shrink. This goal is unrealistic, and the practice is harmful to the air traffic control system.

Short-handed shifts, Overtime and Fatigue

The staffing shortage has created an environment conducive to high levels of fatigue among Air Traffic Controllers. Operations managers at understaffed facilities are faced with two choices for handling the ever-increasing air traffic: call in overtime or work short-staffed. In the most severe cases, they must do both simultaneously. Each of these options creates fatigue among the workforce.

The only way to fully staff shifts at severely understaffed facilities is to call in excessive overtime. While moderate amounts of overtime can be absorbed into the system without noticeable effects on performance, excessive overtime introduces fatigue into the system. In order to absorb the fatigue-inducing effects of overtime, an individual controller must have

sufficient time for recovery following a long week, while the workforce must be made up of non-fatigued controllers who can provide support during the shifts themselves. A recent study by the Government Accountability Office (GAO) reports that "at least 20 percent of the controllers at 25 air traffic control facilities, including towers at several major airports, were working six-day weeks." [18] These 25 facilities included six facilities that had between 40 percent and 52 percent of its controllers working six-day weeks, and seven facilities that had 30-39 percent working six-day weeks. Hartsfield-Jackson International Airport in Atlanta, the busiest airport in the country, had 52 percent of its controller workforce regularly working six-day weeks. This overtime rate is excessive. Under this system, an individual controller is likely to be required to work multiple six-day weeks in a short span of time, removing his opportunity for recovery. Additionally, a significant number of controllers on each shift are working overtime schedules, scarcely allowing a fatigued controller to rely on his coworkers for operational support, as the coworker's needs are as great as his own.

The other alternative is to work each shift without proper staffing levels. Prior to the imposition of the Agency's work rules in September of 2006, many facilities had locally-agreed-upon staffing levels for each shift, with larger facilities having these levels further delineated by area. Results of a recent facility survey conducted by the National Air Traffic Controllers Association (NATCA) showed 97 percent of facilities are operating at least one controller short on a typical shift. The average morning shift is operating with 1.7 fewer controllers than had previously been authorized (4.2 at major facilities), more than 367 controllers short in total. In the evenings the numbers are even worse. Each shift is short 1.8 controllers, for a total of 383 controllers short in the 211 facilities that responded to that question in the survey. [19]

Some of the busiest facilities in the country are also some of the most short-staffed. McCarran International Airport in Las Vegas (LAS) operated with only 33 percent of the authorized number of controllers on a randomly selected day. JFK Tower in New York operated with 43 percent of the authorized amount.

A short-staffed shift often means controllers are afforded fewer opportunities for rest and recovery during the shift itself. They are being required to work longer on position and given shorter rest periods. Although the FAA had, until recently, limited time on position to 2 hours based on the results of a Civil Aeronautics Medical Institute (CAMI) study, this limitation was removed when the imposed work rules were instituted. In Atlanta tower (ATL), controllers describe that they are given exactly 20 minutes of break time, regardless of the length of time on position or the intensity of the traffic.

Not only are controllers working longer on position, but the workload during that time has increased as well. On a short-handed shift, managers reduce the number of Radar Assistants (RAs), increasing the workload for the controller working radar. A controller working without an assistant is responsible not only for communication with aircraft but also coordination with

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[18] GAO Report to Congressional Requesters, *Runway and Ramp Safety: Sustained Efforts to Address Leadership, Technology, and Other Challenges Needed to Reduce Accidents and Incidents* GAO-08-29

[19] NATCA Government Affairs department issued this survey on 11 November 2007 and collected responses through 29 January 2008. A total of 238 responses were received. 215 facilities answered the questions relevant to the shift staffing statistics indicated. The data shown is based on the responses from those 215 facilities.

other controller positions and facilities and updating flight progress information. Additionally, managers may be forced to combine positions, creating greater complexity by requiring each controller to monitor greater numbers of confliction points and an increased volume of aircraft. One recent internal FAA document reported that so far this fiscal year as many as 56.3 percent of errors in Eastern En Route facilities occur when there are combined sectors, combined Radar/RA positions, or both.[20]

Although levels of fatigue cannot be easily measured, the effects are very real and should not be underestimated. One study showed that the cognitive psychomotor impairment experienced after 17 hours of sustained wakefulness was the equivalent of that experienced by an individual with a blood alcohol concentration of .05 percent, the legal intoxication limit for driving in most western countries.[21] For air traffic controllers in particular, a GAO report on runway and ramp safety[22] cited controller fatigue as one of the main threats to runway safety and asserted that "progress on addressing runway safety will be impeded until the human factors issues involving fatigue are addressed."

The relationship between safety and fatigue is clear. In April 2007, the National Transportation Safety Board (NTSB) placed fatigue on its list of most-wanted transportation safety improvements, calling upon the FAA to take steps to "reduce accidents and incidents caused by human fatigue." Since 1989 the NTSB has issued more than 80 fatigue-related safety recommendations.

When it comes to controller workload, one study explained "unacceptable overload results in performance failure."[23] However, as safety is always the top priority for air traffic controllers, these individuals do everything in their power to avoid performance failure. A study found that most controllers use some form of adaptive strategy to manage their performance vis-à-vis workload and fatigue, "Controllers handled an unexpected increase in traffic load adaptively by decreasing the amount of time they spent processing each aircraft, especially in verbal communication with the pilot. Controllers may also cease less important, peripheral tasks, thus leaving more time for active control, or alternatively they can regulate load by increasing spacing, stacking aircraft, or preventing aircraft from entering their sector."[24] Each of these adaptive strategies result in a decline in service or efficiency; the last three strategies involve slowing the flow of air traffic, contributing to delays.

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[20] Weekly En Route (FY 08) Report May 30, 2008 Eastern Facilities, Federal Aviation Administration.

[21] Dawson, Drew and Katherine Reid, "Fatigue, Alcohol, and Performance Impairment", *Nature* vol. 388 p. 235-237. 17 July 1997

[22] GAO Report to Congressional Requesters *Runway and Ramp Safety: Sustained Efforts to Address Leadership, Technology, and Other Challenges Needed to Reduce Accidents and Incidents* GAO-08-29

[23] Raja Parasuraman, and Peter A. Hancock, "2.4 Adaptive Control of Mental Workload," in *Stress, Workload, and Fatigue* ed. Peter A. Hancock and Paula A. Desmond (Mahwah, NJ: Lawrence Erlbaum Associates, 2001), 306 http://www.questia.com/PM.qst?a=o&d=108667168.

[24] Raja Parasuraman, and Peter A. Hancock, "2.4 Adaptive Control of Mental Workload," in *Stress, Workload, and Fatigue* ed. Peter A. Hancock and Paula A. Desmond (Mahwah, NJ: Lawrence Erlbaum Associates, 2001), 306 http://www.questia.com/PM.qst?a=o&d=108667168.

Casualties of Understaffing: Safety

A survey of more than 230 air traffic control facilities showed an overall eight percent increase in operational errors between FY 2006 and FY 2007. Seventy-eight facilities – including 36 major facilities – reported an increase in errors.[25] It should be noted that these survey results are likely to reflect an underestimate of the actual increase in near-misses. In June of 2007 the Federal Aviation Administration (FAA) redefined the term operational error so as to only include those incidents where less than 90 percent of the separation minimum was maintained, thereby skewing the statistics to give the appearance of improvements to safety.[26]

So far in FY 2008, safety appears to be further compromised. Except for the first two days of the fiscal year, the FAA has exceeded its own benchmarks for allowable numbers of operational errors every day.[27] As of June 2nd, there have been 249 serious operational errors (Category A & B) this fiscal year, 17 percent more than the FAA's own performance limit. Runway incursions are also a serious problem. Identified by the National Transportation Safety Board (NTSB) as an area in serious need of safety improvements, the FAA's record has worsened on runway incursions this fiscal year. As of June 2nd, there have been 16 serious runway incursions (Category A & B), a 45 percent increase over the same time last year.

Although the FAA has frequently stated publicly that we are in the "safest period of aviation history"[28], internal FAA communications paint quite a different picture. In a memo dated May 16, 2008, a District Manager wrote to his local managers, "As you are already aware of, we are experiencing a significant increase in operational errors across the country. The greater concern is the rise in A and B errors and it's starting to look like we might not meet our flight plan goals if we do not get the operational errors under control as soon as possible."[29] Similarly, in an FAA briefing on OE/ODs in March of 2008, the Agency stated that "there has been a <u>dramatic</u> increase in OE/ODs reported in Terminal during January, February and March 2008" (emphasis FAA's).

These documents also suggest causes for the increase in operational errors. The May 16th memo states that, "Overall, the operational errors (from a national perspective) seem to be occurring in light traffic situations and are related to a general lack of attention or situational awareness." The memo goes on to say that "Another area of concern is the rise in operational errors while conducting OJT." The March presentation also lists "OJT in progress" as well as "Non-FPL [full performance level] working position" as factors in operational errors.

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[25] NATCA Government Affairs Department issued this survey on 11 November 2007 and collected responses through 29 January 2008. A total of 238 responses were received.

[26] FAA Air Traffic Organization Policy Notice N JO 7210.663, Subject: Operational Error Reporting, Investigation, and Severity Policies

[27] Source: FAA today 10/1/2007 – 6/2/2008

[28] FAA press release April 2, 2008 "FAA Announces Improvements to Inspection Program"; Remarks by Mary Peters to the Aero Club January 22, 2008 "Aviation Congestion And The Way Forward: No More Delay"; Statement of Hank Krakowski COO of the ATO before House Transportation and Infrastructure on Subcommittee on Aviation February 13, 2008.

[29] Federal Aviation Administration Memorandum from David A Price, District Manager, Kansas City District to All Kansas City District Managers. Subject: Operational Errors. May 16, 2008

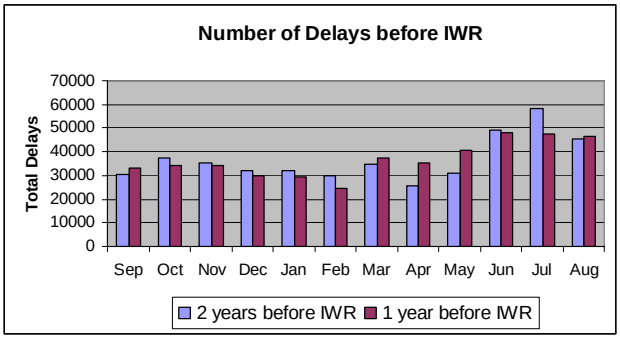
These causes are consistent with NATCA's assertions that understaffing, fatigue, and high trainee ratios are serious liabilities to the safety of the National Airspace System. Lack of situational awareness, particularly during low-traffic situations, is indicative of fatigue. Controllers have frequently reported making errors in the comparative calm following a major push when their tired minds begin to relax. Understaffing limits a controller's ability to take breaks and recuperate after busy times, leaving a fatigued controller behind the scope. The fact that errors are occurring frequently when developmentals are working solo and during OJT indicates that the high ratios of trainees and overreliance upon those without full certification to work traffic is detrimental to the safety of the NAS, as well.

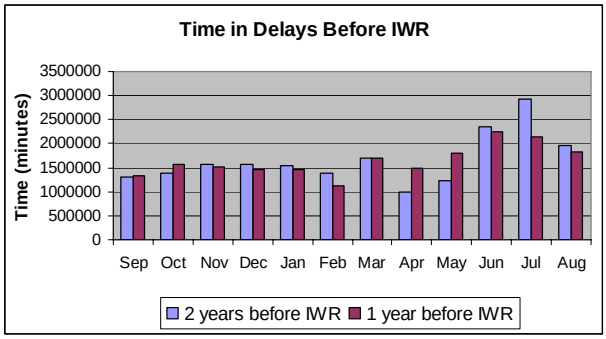
Casualties of Understaffing: Delays

As any air traveler in the United States can tell you, delays have increased significantly throughout the National Airspace System (NAS) over the last several years. 20,378 more aircraft were delayed in FY 2007 than in the previous fiscal year. The average length of the delay also increased by over six minutes, making for a combined increase of nearly 363 weeks over the previous fiscal year.[30]

There are many factors which can contribute to delays including, but not limited to weather, airline scheduling, overcrowded runways, and airport construction. Yet these factors have been relatively stable. A popular misconception attributes this increase in delays to an increase in air travel. However, the increase in delays far out-measures the increase in operations. According to FAA data, total operations in FY 2007 were only 0.2 percent higher than the previous fiscal year. In contrast, total time of delays increased by 18 percent.[31]

The variable that has changed in the past few years has been the staffing levels at air traffic control facilities. The steep increase in delays can be largely traced back to the work rules imposed on the air traffic controllers. Observe the following pairs of graphs. The first pair shows delays by month from September 2004 to August 2006 – the two years immediately preceding the imposition of the imposed work rules. While overall errors increased in the latter year the increase was by no means consistent.[32]

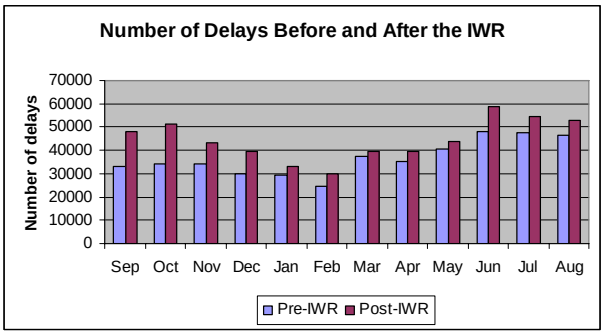


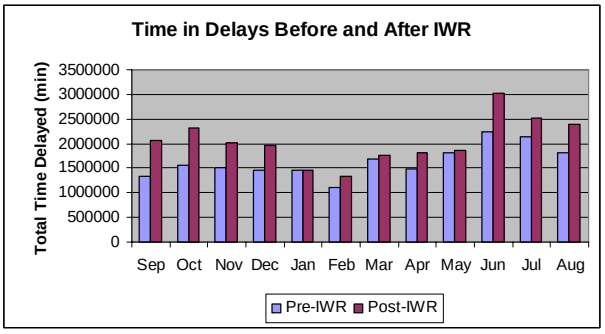


This stands in stark contrast to the second pair, which looks at delays from September 2005 to August 2007 – the years immediately preceding and immediately following the imposed work

[30] Source: OPSNET delays database
[31] Source: OPSNET operations database
[32] Source: OPSNET delays database

rules. During the first year under the imposed work rules, there has been a consistent increase in delays in every single month, as well as a far more profound increase in overall delays.





It comes as no surprise that the facilities suffering from some of the most dire staffing shortages are also experiencing severe increases in delays. Philadelphia Airport, for example, is operating with 42 fewer controllers than it was authorized in 1998 (61 percent), and is ranked 29th of 32 in departure on-time performance with only 69 percent of flights leaving on time. This is a three-point decrease since the previous year and a 13-point decrease since 2002.[33]

In fact, the five worst-ranked airports for arrival delays are each operating with no more than 76 percent of its approved work force. LaGuardia, the airport with the largest percentage of arrival delays, has 64 percent of its approved number of controllers; Newark has 65 percent; JFK has 73 percent, Philadelphia, as noted above, has 61 percent, and O'Hare has 76 percent of the approved workforce. [34]

Even those facilities with comparatively few delays are beginning to feel the effects of the imposed work rules. Orlando Airport has fallen from fifth in on-time performance (arrivals) to 15th between November 2006 and November 2007. During that same time frame, 34 individuals –nearly 50 percent of those employed there – left the workforce at Orlando Tower. [35]

Realigning of Facilities and Services Impacts Staffing

Another factor that will further aggravate the staffing crisis is the Federal Aviation Administration's (FAA) recent insistence on moving forward with ill-conceived facility and service realignments. Consolidations, co-locations and decombinings actually require more controllers, not less.

When controllers at such facilities are certified in both the tower and the radar room, management has the flexibility to pull from each to fill gaps when a controller calls in sick or takes leave. If the tower is down a man, the ATM can call on a controller working in the TRACON to go upstairs, and vice-versa. When the facilities are split and controllers are only trained to work radar or tower, management loses that flexibility and therefore staffing must be increased to compensate.

[33] RITA Bureau of Transportation Statistics
[34] RITA Bureau of Transportation Statistics
[35] RITA Bureau of Transportation Statistics

In the past, National Air Traffic Controllers Association (NATCA) has endorsed realignments when the restructuring not only sought to save money but also to increase efficiency and provide operational benefits, and made sense from a workforce and airspace perspective. In such situations, NATCA and the FAA, working collaboratively, mutually agreed that additional controllers would be needed to accommodate the moves safely and efficiently.

In Chicago, New York, Atlanta, Northern California, Dallas, Southern California and Washington, DC, (where the radar functions of BWI, National, Andrews, Richmond and Dulles airports were combined into one single facility - Potomac TRACON), the Agency and the union worked together to ensure that positions were filled and scopes were manned when the radar functions were removed from the towers in combined, or up/down, Tower-TRACON facilities. In stark contrast, the FAA's most recent round of realignments is being conducted without controller involvement or input, and NATCA's concerns about the lack of controllers to adequately and safely fill positions are being ignored.

Southern California TRACON (SCT), one of the most woefully understaffed facilities in the country with 100 less controllers today (160) than it had in 2004, was forced last year to reconfigure its operations to absorb the radar functions and air traffic operations of the Palm Springs International Airport (PSP). The transfer of PSP radar has been anything but smooth, with numerous radar and communication outages taking place since the move last year, and it has been further complicated by the dreadfully low staffing levels, leading to a backlog in controllers waiting to certify on airspace despite the Agency cutting back on training requirements.

The FAA has since moved the radar functions from Beaumont to Houston, is in the midst of moving Pueblo to Denver and will soon begin similar moves in Charlotte, Philadelphia, Miami, Memphis and Palm Beach. Before these major realignments can be allowed to move forward, significant concerns, such as insufficient staffing, must be addressed.

Recommendations

1. The first and most important step in controlling the air traffic controller staffing shortage is stemming the flow of experienced controllers from the workforce. In order to do stabilize the workforce, we must remove the push factors created by the imposed work rules. These include, but are not limited to, a reduction in pay resulting in many controllers having already worked their highest three salary years, reduction of time and availability of rest periods, unpopular changes to leave policy, and an unfriendly work environment. The only way to effectively and comprehensively, mend this situation is for **the imposed work rules to be removed and for the FAA to return to the bargaining table with NATCA in order to reach a mutually-acceptable contract.**

2. In its 2007 workforce plan, the FAA established a new set of staffing ranges which replaced those established in 1998 based on a scientific formula which took into account time and motion studies, sector complexity and workload, number of operations on the

90th percentile day, and relevant non-operational activities (i.e. training, leave). The new ranges appear to be based more on available staffing than actual air traffic control needs. **The FAA must work with NATCA and the National Academy of Sciences, or other independent third party, to re-establish scientifically-based staffing ranges for each facility.**

3. Poor planning and unprecedented attrition have combined to create an unmanageably high ratio of trainees to total workforce that has proven harmful to the safety and efficiency of the NAS and to the effectiveness of the training program. The FAA must not be permitted to continually re-baseline acceptable trainee ratios nor conceal from stakeholders the reality of the training situation. **The FAA must work with NATCA and the National Academy of Sciences, or another independent third party to establish concrete limits on trainee ratios on the facility level. These ratios along with the current Trainee/Certified Professional Controller breakdown of the workforce by facility, must be published in the FAA's annual workforce report.**

4. High level terminal facilities are being forced to train developmentals with no previous air traffic control experience, despite lacking training infrastructure or curricula to handle their educational requirements. The FAA must remove the imposed pay rules, and return to the bargaining table with NATCA to **reach a contract that would re-institute a career ladder,** encouraging experienced controllers to transfer to more demanding facilities.

5. Standardized training has produced the safest air traffic control system in the world. Unfortunately, the imposed work rules have so significantly impeded the FAA's ability to provide that training that the Agency's has resorted to issuing waivers to bypass certain training requirements in facilities across the country, including such busy facilities as Chicago, New York, Miami, Houston and Indianapolis. NATCA opposes the blanket issuance of such training waivers and strongly recommends that **standardized training continue to be the foundation for the development of skilled and capable air traffic controllers.**

6. There are many multifaceted challenges facing the FAA, including staffing, training, and new technologies and policies. Many of the difficulties we are now experiencing with staffing and training could have been reduced in severity or avoided entirely if the FAA had been willing to work meaningfully with NATCA. **In order to avoid such crises in the future, the FAA must work collaboratively and cooperatively with NATCA on all issues affecting air traffic controllers or their operations.**