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Monroe County Board of County Commissioners  
1100 Simonton Street  
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Subject: NAS Key West AICUZ

## Executive Summary

As a retired Naval Aviator *and* an involved Keys' citizen, I feel a strong sense of responsibility to weigh in on what appears to be a growing likelihood of a painful collision of those two worlds over the Air Installation Compatibility Use Zones (AICUZ) for Naval Air Station Key West, Florida.

Below, I have tried to identify the issues objectively with a goal of finding common ground that will satisfy the Navy's need to train and allow my civilian friends to live in peace. There is a great deal at stake for both sides.

The issue boils down to Encroachment – but it is a two-edged sword. The Navy has a right to expect that their pre-existing facility will not be forced to curtail operations because of subsequent development. Concurrently, the resident civilian community has the right to live free of *increased* impacts from Navy operations.

While there are indications that development encroachment is a factor, my preliminary findings have revealed a far greater encroachment imposed by the Navy. In addition, the Navy has failed to adequately involve the community in pertinent decisions, which has caused them to feel betrayed and abandoned. Among my recommendations, I suggest that the Navy fulfill their own AICUZ "Recommended Actions" and appoint a well-qualified AICUZ Officer and launch a sincere community outreach program (expressly not a public-relations campaign) to address the very real concerns of their host community, starting with an honest assessment of the environmental impacts of their current and planned activities.

If the Navy fulfills its responsibilities, Monroe County should uniformly ban all encroaching new development.

While the Navy brings many benefits to the area, it would be foolish to assume that the civilian community would never seek to sever their long-standing relationship. Economic concerns do not bind many of those who are most affected. Indeed, some who might suffer economically have expressed overriding concerns for their health, while others would profit from base closing.

Similarly, the County must be aware of the strategic importance of the Navy's facilities and the staunch defense of it that they will muster.

I believe there is a small chance for reconciliation that will depend on swift, sincere action from the Navy followed by equally sincere and robust action by the County. Failure to do so is likely to fuel the escalating confrontation.

Below is my best attempt to identify the issues and articulate solutions. If my analysis is incorrect, I welcome factual, public debate.

## Issues

### 1. Introduction of a noisier airplane without any analysis of the community impact

#### Non-linear noise propagation

According to Wyle Laboratories—the consultant who calculated the 2004 and 2007 AICUZ Day/Night Average Noise Levels (DNL) zones—the program used in those reports (NoiseMap) is not capable of predicting the noise impact of the latest aircraft (F/A-18E/F (Super Hornet), F-22 and F-35) because those aircraft exhibit non-linear noise propagation, and in the case of the F-22 and F-35, because of thrust vectoring. In simple terms, non-linear noise propagation means the level of noise does not dissipate at a constant rate. In this case, it means that the actual noise received at a distance from the noise source is often substantially greater than the noise predicted using obsolete modeling techniques like those used for the 2004 and 2007 AICUZ updates. Thrust vectoring is the ability to “point” the engine exhaust nozzle in order to change the angle of the airplane more rapidly than possible using traditional aerodynamic means. Because the exhaust nozzle can be pointed in other than the traditional straight-out-the-tail direction, the noise can also be “vectored”. According to Plotkin and Schultz of Wyle Laboratories (*Development of an Advanced Acoustic Model for Military Aircraft Noise*, 2007), the difference between the predicted and measured sound level can be as much as 20 dB for these cases. They recommend the use of Advanced Acoustic Model software (such as NMSim). To be clear, the F/A-18E/F aircraft is an immediate factor, while the F-22 and F-35 represent the next generation. The F-35 will replace older F/A-18s.

According to the *“Final Environmental Impact Statement for the Introduction of the F/A-18E/F to the East Coast of the United States”* (FEIS), the Field Carrier Landing Practice (FCLP) Sound Exposure Level (SEL) for the **F-14 is 99 dB**, while the **Super Hornets that have replaced the F-14 would produce 117 dB**, for an increase of 18 dB (Table 6-13, page 6-29). According to the NAS Key West 2007 AICUZ update (paragraph 4.3) and Waltz, Luckachko and Lee in their document *“Military Aviation and the Environment: Historical Trends and Comparison to Civil Aviation”*, a 10 dB increase doubles the annoyance level (AICUZ update paragraph 4.3), and **a twenty dB increase is perceived as four times louder**.

### 2. Questionable and undocumented modification of the AICUZ noise zones

The 2007 AICUZ Update (Introduction, section 1.5) states: “...The flight track for the approach to runway 07 was subsequently shortened from the standard flight track

used. **This change had a negative impact on NAS Key West air operations** but was modified by the Navy due to several factors. The factors include: the majority of operations using the airfield are by tactical military aircraft capable of tighter turns; pilots using the airfield are experienced in tactical maneuvers; weather for Boca Chica Field provides for 97% VFR flight conditions; and the pattern could be managed through a modification of course rules, thorough flight briefings and aggressive air traffic control procedures...”

*Who asked for this track modification and why did the Navy grant it? The explanation cited above lists the methods to accommodate the change, not the reason it was modified. At a recent Monroe County Board of County Commissioners meeting, neither the County nor NAS Key West claimed knowledge.*

3. **Air Installation Compatibility Use Zone.**

“Compatible” is defined as “able to exist, live or work together without conflict.” That’s the goal of an AICUZ.

4. **Deficient measurement of noise - Counting 1/2 of “closed pattern” events as was done for the 2004 and 2007 AICUZ updates is inconsistent with the FEIS method.**

The FEIS (page 12-6) states that “...each touch and go is counted as two operations: the landing is counted as one operation and the takeoff is counted as another.” **But in the 2004 and 2007 AICUZ updates (paragraph 3.3), the total number of operations of aircraft in FCLP, Touch and Go and Ground Controlled Approach (GCA) patterns is divided by two.** It makes no sense to divide the number of events in half just because the aircraft will return soon to land. To a person inside their home, if one airplane takes off and one lands a minute later, it matters not if that was the same airplane. Folks in their homes do not experience 1/2 of the noise just because the airplane is doing a GCA.

5. **Failure to address the Environmental Impact of the F/A-18E/F on NAS Key West**

The FEIS and Supplemental Environmental Impact Statement (SEIS) purport to evaluate the Environmental Impacts of the “Introduction of F/A-18E/F (Super Hornet) Aircraft to the East Coast of the United States.” Eight potential home-basing and six Outlying Landing Fields (OLF) alternatives were analyzed, and yet **NAS Key West was not evaluated in the 1,087-page document.** With the exception of eliminating NAS Key West as a potential Home Base because of its distance from the nearest Air-to-Ground range, **there is absolutely no discussion of the environmental impact of this very different aircraft relative to Key West.**

The magnitude of operations and resulting AICUZ impact at NAS Key West warrants full National Environmental Policy Act (NEPA) consideration, but only cursory review has been provided. The projected number of annual operations at the potential Outlying Landing Field (OLF) evaluated at length in the FEIS is 31,652 (FEIS, page 12-6), while the number of annual air operations projected for NAS Key West is 61,402, including 30,000 F-18 operations (16,000 F/A-18E/F and 14,000 F/A-18C/D), (NAS Key West 2007 AICUZ Update, p. 3-9).

The fact that there are no resident aircraft at NAS Key West is irrelevant to the impact of their operations. In actuality, transient pilots and their relative unfamiliarity with the operations and noise sensitivity are detrimental factors that lead to a greater likelihood of deviations from the ideal flight track, altitude and speed. Such deviations can be a greater factor in perceived noise than the noise characteristics of the aircraft.

The F/A-18E/F is mentioned in only 3 of the 232 pages of the “Environmental Assessment for Fleet Support and Infrastructure Improvements – Naval Air Station Key West” (EA). The document itemizes the impact of modernizing “ship and aircraft support functions and facilities”, with the bulk of the discussion focusing on ship support and dredging. If the EA fulfills the legal requirements of NEPA, then it certainly does not fulfill the spirit of that law.

*The three pages of the EA constitute the entirety of the environmental assessment for the introduction of the F/A-18E/F to NAS Key West.*

6. **“Local governments have the responsibility to protect the health, safety and welfare of their respective residents.”** (2007 AICUZ, paragraph 1.3, page 1-3)

Doing so requires honest and complete information.

#### 7. **Inadequate Community Outreach**

While the NAS Key West Public Affairs Officer has been prompt and open, the community in general has not been provided a complete and honest picture of the changes imposed by the introduction of a much noisier airplane.

#### 8. **Strict adherence to building restrictions within the AICUZ**

Monroe County must do its part to ensure that development is curtailed within a properly defined AICUZ.

9. **The disparity between the theoretical sound levels (as described by the DNL zone lines in the 2004 and 2007 AICUZ studies) and the anecdotal (and measured) sound levels in the surrounding community is substantial, and warrants “ground-truthing”.**

The Navy should volunteer to measure empirical DNL levels, based on actual flight paths, altitudes and real-world aircraft noise propagation. Indeed, in the absence of such, affected citizens have already begun their own measurements. As a result, the Navy has allowed their credibility with the civilian community to deteriorate.

10. **Failure to acknowledge increased sound levels leads to a widening gap between Navy statements and community experience, with resulting elevated cynicism.**

When honest communication breaks down between a government and its citizens, conspiracy theories and cynicism abound. It is clear from many researchers that the F/A-18E/F is a much louder aircraft compared to its predecessors, and yet the Navy has been dismissive of valid noise complaints.

## Recommendations:

- A. Appoint a well-qualified AICUZ officer to act as liaison with the civilian community.
- B. Establish a credible community outreach program. *Both of these recommendations reside in the 2004 and 2007 AICUZ updates (Section 8.2.1), but have not been accomplished.*
- C. Deliver a National Environmental Policy Act (NEPA) Environmental Impact Statement that properly and completely evaluates the impact of the F/A-18E/F on NAS Key West and environs, including proper noticing and community participation.
- D. A proper AICUZ map should be created for NAS Key West using Advanced Acoustic Model software that accounts for non-linear noise propagation.
- E. The Navy must require compliance with the established flight paths, altitudes, times and speeds. While youthful exuberance is and should be encouraged in Naval Aviators, the value of this facility to our National Defense requires that such exuberance—if it is manifested in the form of noise violations—be channeled to facilities that are not at risk from excessive noise.
- F. The Navy should perform an in-depth analysis to determine to what extent they can fulfill their essential training goals while minimizing the impact of noisier aircraft.
- G. The Navy should give strong consideration to providing noise monitors in the surrounding community to provide an objective measure of noise-related flight violations. Although detested by pilots, this is a common surveillance practice for civilian airports, and is called for in light of the noisier aircraft currently flying at NASKW.
- H. Training to land safely on an aircraft carrier is a very demanding task that requires many critiqued practice landings known as Field Carrier Landing Practices (FCLPs) prior to landing on a ship. The pattern at the ship is typically an 800-foot Carrier Break pattern, followed by a 600-foot pattern altitude leading to a landing on the flight deck. Subsequent landings are done with a 600-foot pattern. Practice approaches and landings at a land-based site are done with as much commonality as possible to the ship pattern.

Curiously, according to the 2004 and 2007 AICUZ updates, there were **zero** 800-foot Carrier Break Arrivals for E-2 and C-2 aircraft in CY01, and yet they performed far more FCLPs than any other aircraft (6,952 of the 7,436 total). The Carrier Break arrival (5,291 for all other aircraft in CY01) is an unnecessarily noisy maneuver in a noise-sensitive environment because there is little training value if it is not done in conjunction with FCLPs. It is noisier because it is flown at roughly 1/2 the 1500-foot altitude of the Overhead Break arrival.

**Reduction in the number of unnecessary 800-foot Carrier Breaks done should be considered as a means to reduce the noise impact of training operations.**

It would appear that this would be easy to accomplish since the E-2s and C-2s did nearly 7,000 FCLPs without ANY Carrier Breaks. Similarly, there is a disconnect between the number of Carrier Break patterns performed by all other aircraft (5,291) compared to the 484 FCLPs they subsequently made.

Are these data correct?

- I. Although bordering on blasphemy, the Navy should consider changing their time-honored aircraft carrier operations to reflect the reality of the available, land-based training environment, particularly if current and future aircraft are and will continue to be considerably noisier than their predecessors. Thus, it may be fruitful if the carrier pattern were elevated to a 1000-foot Break and 800-foot pattern altitude universally, as was done for FCLPs at NALF Fentress (FEIS, p. ES-4). Eight hundred feet is 33% higher than 600 feet, and the resulting sound attenuation is worth considering. This would involve a painful adjustment, since over 80 years of development has gone into the current system, and aircraft carrier visual landing systems and the “eye” of the Landing Signal Officers (who monitor and critique carrier landings) are all calibrated to the 600-foot pattern. One serious weakness of this proposal is that it would tend to elongate the distance and therefore the time needed to recover aircraft at the ship. The amount of time that the aircraft carrier can stay on a given heading for the recovery of dozens of airplanes is often limited.

In lieu of a universal change, the Navy would be well served to consider making the 1000-foot Carrier Break and 800-foot FCLP pattern standard at NAS Key West, as is the case at NALF Fentress, while using the 1500-foot pattern as much as possible.

- J. Monroe County should commit to adoption of a properly defined AICUZ to replace the 1977 AICUZ that is incorporated in the Monroe County Land Development Regulations, and the Federal Government should accept responsibility for “takings” if they are unable to adequately curtail their encroachment.
- K. Monroe County Attorney Opinion 001-2005 describes aptly Monroe County’s position relative to the proposed 2004/2007 AICUZ. While they do not oppose eventual implementation of some or all of the AICUZ update provisions, the current Monroe County Growth Management Division Director recommended that the County NOT become a party to this AICUZ study. It will take a considerable amount of sincere community liaison on the part of the Navy to convince skeptical County officials and their constituents to do otherwise.

**L. Don’t overplay the patriotism card**

It is *not* unpatriotic for citizens to petition their government for relief from a health threat imposed on them without their consent.

## Summary

It is my belief that the Navy has a small window of opportunity to re-establish an atmosphere of trust with the community surrounding NAS Key West. It is a vitally

important facility with a long and proud history. Encroachment goes both ways. Concurrent with Monroe County's strict adherence to development restrictions within a properly defined AICUZ, the Navy must divulge the true nature of their encroachment and curtail it to the maximum extent possible consistent with attaining their essential training goals.

It is my goal that the growing confrontation will be defused through frank and honest community liaison, leading to an agreement on an updated AICUZ study and a reasonably peaceful and *compatible* existence with the surrounding community.

Sincerely,



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