

Before the
Federal Aviation Administration
Washington, D.C. 20591

In the Matter of)	
)	
Safe, Efficient Use and Preservation of the)	Docket No. FAA-2006-25002
Navigable Airspace)	Notice No. 06-06
)	

Comments of the

ASSOCIATION OF FEDERAL COMMUNICATIONS CONSULTING ENGINEERS

The Association of Federal Communications Consulting Engineers (AFCCE), through its Aeronautical FAA Liaison Committee, respectfully submits these comments for the record in the above captioned proceeding. AFCCE is an organization of Communications Professionals established over 50 years ago whose members include licensed professional engineers who serve clients in all fields of radio communications, executive engineers in major broadcasting/communications companies/organizations, as well as associate members in allied companies such as equipment manufacturers, service providers, government agencies and communications law professionals. It regularly participates in rule making activities which may affect its members and their clients, and through its committee structure, offers its expertise to regulatory and standards-setting bodies on a broad range of communications issues. It has previously commented to the Federal Communications Commission and the Federal Aviation Administration on matters included in the instant NPRM.

Use of the "Airspace"

The "airspace" above the earth's surface has many users including manmade structures (buildings, smokestacks, water tanks, etc.), radio communications systems (antennas, towers), and aviation. It is not the purpose of these comments to argue whether these categories of users are co-equal but to assert that aviation is not the only airspace user, particularly of that airspace within 2,000 feet of the surface formed by the natural terrain. The use of that airspace by the first two categories of users is controlled, by and large, by the local authorities through zoning and permitting processes. These rights are not reserved to the federal government nor federally pre-empted by any statutory authority. Thus, a local government may approve construction of a tall building, for example, regardless of the opinion of the FAA even though that construction may have a perceived adverse effect on an aeronautical facility or operation. Entities other than those having aviation interests also have rights to use the airspace.

Statutory Authority

The FAA appears to be confusing its mandate to "consider" aeronautical obstructions with an assumed authority to approve (or disapprove) such constructions. No such authority exists nor was it intended. The FAA's role under the Federal Aviation Act is to evaluate the impact of proposed construction on the National Airspace System (NAS) and, if such construction is deemed to be a "hazard to air navigation", to notify aircraft operators/pilots of such hazards and/or amend its procedures such that aircraft under its control avoid the obstructions with appropriate safety margins. The agency has no direct authority to stop or prevent construction of any structure which has been approved by local authorities.

Because of the existence of an interagency agreement, the Federal Communications Commission (FCC) will not issue a construction permit for a proposed radio frequency emitter ("station") if the FAA has determined that such construction would, by virtue of its conclusion of substantial adverse effect on the safe and efficient use of the navigable airspace, be a hazard to air navigation.

While the construction of most stations requires pre-approval of the FCC (via the construction permit or licensing processes) there are many services or types of services which do not require prior, site-specific authorization from the FCC. This includes cellular/wireless services and BRS/EBS systems which use frequencies identified by the FAA in the NPRM as requiring notice. The plethora of unlicensed services being authorized by the FCC would also fall into this category and would use most of the frequency bands identified by the FAA to fall under its notification requirements. It is not clear that the FAA's proposed notification process would encompass these users or how the agency would effectively control such construction.

Historical Data

The FAA maintains an aviation incident/accident database apart from the National Transportation Safety Board (NTSB) database. The latter database contains only events which meet the NTSB criteria for defining an "incident" or "accident" which would not include many of the incidents reported in the FAA database, particularly with respect to minor events not involving air carrier (airline) operators.

The FAA database covers the period from 1983 to the present – nearly 24 years – and contains 86,525 separate event entries. A search ^{1/} of this database for radio (communications, navigation) interference entries yielded only one incident. That incident (involving an air carrier operation at Fairbanks, Alaska in 2003) apparently was caused by a classic “stuck-microphone” event where the airliner’s defective radio equipment “experienced uncontrolled radio transmissions” interfering with all communications on the frequency (including ATC communications to other aircraft). The interfering airliner crew apparently solved the problem by shutting-off the equipment and using a cell phone to communicate with ATC.

Thus, in 24 years and 86,525 incidents, exactly none, zero, were of the type that the FAA seems to be concerned about and which its proposed onerous notification rules would have addressed.

Out of an abundance of caution, the NTSB database – which begins in 1962, nearly 45 years ago – was also searched. Only one “hit” was found in those 45 years of data. This incident report related a 1999 event where a helicopter, in Portugal, flew directly in front of “the main lobe of a high frequency, high energy transmission antenna” which caused interference to its radio and on-board intercom systems as well as engine control and telemetering equipment. The event prompted a precautionary landing resulting in no damage or injuries. Interestingly, the frequency band in which this interference occurred –

^{1/} To facilitate the search of the 86,525 events, the search engine was limited to the principal phases of aircraft flight and ground operation phases including:

- Ground/Taxi Preflight
- Take Off, Initial Climb
- Normal Cruise
- Holding
- Final Approach, Landing
- Missed Approach
- Taxi Post-Landing

All categories except “Normal Cruise” yielded zero “hits”.

the high frequency band – is not covered by the FAA’s proposal. Again, a non-event for the purposes of this proceeding.

Basis for Assumption of Interference

As previously noted, there is virtually no history of any accidents or incidents in the extensive NTSB database covering over 40 years or the 20+-year span of the FAA database which cite “interference” as a causal or related factor; this fact speaks volumes regarding whether the draconian process the FAA is proposing is really needed.

The FAA offers no technical support for its premise that transmitters in any of the designated frequency bands has any calculable potential for interference to aeronautical facilities. It only states these emitters “may” cause interference; no examples, calculations, data, analyses or other support is proffered. Perhaps this is because there is no scientific basis for support. AFCCE submits that such an unscientific approach has no place in this proceeding where the burden of proof that a problem exists rests with the FAA; it has not met that requirement.

Interference Evaluation Methodologies

Over 15 years ago the FAA adopted EMI requirements and also put in-place an Airspace Analysis Model (AAM) which purportedly would permit the prediction of adverse effects to aeronautical navigation facilities by terrestrial radio frequency emitters, particularly FM broadcast transmitters. The model was flawed from the outset and routinely over-predicted interference to the aeronautical facilities. Comments from the industry, including the AFCCE, the National Association of Broadcasters and others prompted the FAA to finally revise the software but, even now, decades later, the current version still does not accurately determine the existence of interference.

A good indicator of the efficacy of an algorithm, such as the AAM, is to apply it to existing, known scenarios and compare the results with the actual experience in the field. In the case of FM broadcasting, for example, the service is mature and there have been few significant changes in transmission facilities - particularly in major urbanized areas - for decades. When applying the AAM to these existing scenarios in places like New York, Chicago, Seattle, Miami, Atlanta and Detroit significant adverse interference is predicted to the principal ILS approaches to all the major airports. These airports handle several thousand flights per day which rely on the ILS systems with no reported problems. Therefore, it would not be imprudent to conclude that the AAM model is not a reliable predictor and is of little value in the real world. The fact that the FAA continues to rely ^{2/} on this model does not speak well of its ability to deal with these types of spectrum management issues.

Over the years, the FAA has focused primarily on interference from high power broadcast facilities in the VHF bands and, even more specifically, on those operating in the FM broadcast band (88 MHz - 108 MHz). In fact, the aforementioned AAM analysis/prediction tool was specifically designed to address FM broadcast issues. Of course, the real issue is not the broadcast transmitters it is the airborne receivers some of which may be susceptible to received-induced intermodulation or "overload" in the presence of signals from properly operating broadcast transmitters (and, in some cases, from in-band signals from the FAA's own ILS and VOR stations). The worldwide aviation community through the ICAO (International Civil Aviation Organization) standards setting body, has implemented standards for aircraft receiver "FM Immunity" which now have the force of law in EU member states and many other countries. While the USA is an ICAO member, represented by the FAA, the FAA has refused to require compliance with this standard for aircraft which operate domestically and has applied it only to air carrier and other aircraft of US registry operating internationally.

^{2/} As of September 7, 2006, the database necessary to run the AAM analysis model was not available on the FAA website and reports from AFCCE members indicate that this condition has existed for some time with no explanation given. Thus, practitioners currently have no way of evaluating proposals on behalf of their clients to determine whether the operating parameters will "pass" the FAA AAM "test", albeit flawed. This capability is essential to properly evaluating and designing such facilities.

Receivers which are in compliance with this standard are “immune” to intentionally generated interference resulting from the presence of properly operating broadcast transmitters but the FAA continues to use the flawed AAM model which was designed to “protect” the worst-case receiver performance – in many cases, receivers designed and installed over 30 years ago.

AFCCE submits that the FCC is the appropriate agency to determine and regulate the out-of-band emissions from radio transmitters which is the principal means of controlling interference; it has done so for over 70 years and has been, so far, extremely effective in doing so. If the FAA believes that the out-of-band emissions from certain categories, classes or types of transmitters may interfere with aeronautical systems in adjacent bands, it must simply request, through the rule making process, that the FCC change existing standards, or implement new requirements, that will adequately protect the aeronautical services. The FCC is the expert agency in these matters and it, solely, authorizes and regulates use of the spectrum allocated for non-government use. To require that entities authorized and regulated by the FCC submit to a process of review (de facto approval) by another agency in matters involving use of the radio spectrum has no statutory basis.

Notice and Availability of Information

For many decades, the venerable FAA Form 7460-1, Notice of Proposed Construction or Alteration, has served both FAA and user needs quite adequately. The construction of a 1,000 ft. (AGL) tower, for example, is recognized as an obstruction (but not necessarily a hazard) to air navigation and there are few, if any, commenters – including AFCCE – who would argue or propose that there is no need to advise the FAA of such proposed construction in sufficient time to allow the FAA to advise aeronautical interests of its presence and to amend its procedures, if necessary; this is also true for shorter structures near airports which have the potential for obstructing established approach or departure procedures.

To suggest, however, that virtually any user authorized by the FCC to use the radio frequency spectrum must submit to an “obstruction” analysis based on EMI considerations is without merit. AFCCE opposes such expansion of notice requirements for the reasons stated herein.

Burden on Spectrum Users

At the time these comments were being finalized, numerous commenters had already posted their comments to this docket. Included therein are detailed analyses submitted by the FCC and several organizations such as the National Association of Broadcasters, PCIA – The Wireless Infrastructure Association – and the National Public Safety Telecommunications Council, all of which support the conclusion that the FAA has grossly underestimated the extent (and cost) of the “paperwork” burden that will be imposed on radio spectrum users. AFCCE has carefully reviewed these comments, agrees in principle with their conclusions, and incorporates them by reference in its instant comments, but believes that the actual error in impact assessment more closely approximates an order-of-magnitude.

AFCCE suggests that the more appropriate way for the FAA to monitor activities in the electromagnetic spectrum not under its purview would be [to] use the extensive and generally complete and accurate FCC databases readily available to anyone at www.fcc.gov. This process can readily be automated to search and evaluate all licensed radio transmission proposals for matters which may be of concern to the FAA.

Other Matters

Termination of Determination of No Hazard. The FAA proposes to dramatically change the current policy regarding the period during which a final determination of “no hazard” remains valid. Currently, a determination remains valid (effective) indefinitely as long

as there is a pending FCC application which has not been finally adjudicated. The FAA states that "if the FCC refuses to issue a permit, the final determination expires on the date of the FCC's refusal". Actually, the language needs to be clarified to state that the termination date is that of the final adjudication of the application. An FCC staff decision to deny issuance of a construction permit is subject to a review and appeal process if requested by the applicant. Though rare, these processes can take years before reaching a final adjudication. An applicant should not survive this process only to find that it no longer has a usable site or operating parameters because the FAA has terminated its determination and, for new reasons, refuses to re-issue a "no-hazard" determination.

Now the FAA proposes to "extend" the original determination (while there is a pending timely filed application for construction permit) "for up to 12 months" provided the additional time "is warranted because of FCC requirements". This is totally untenable for broadcast station applicants and, perhaps, other categories of applicants as the FCC record is replete with instances of protracted proceedings of processing which required months or years longer than the maximum period of 30 months now being proposed by the FAA.

Furthermore, the FAA also proposes that such extensions will only be granted if the applicant can "submit evidence that additional time is warranted because of FCC requirements". There are numerous cases where the FCC has timely issues a construction permit but the permittee is unable to construct for reasons beyond its control. These reasons include local permitting issues, weather delays and equipment delivery problems among others. Applicants seeking an extension must convince the FCC that such conditions exist and that the delay is beyond their direct control. Even though these delays can and do last for months or even years, the FCC has set a very high threshold of proof for grant of an extension. Convincing one regulatory agency that an extension is warranted should be sufficient.

As with the proffered premises for its technical interference requirements, the FAA has presented no support for this portion of its proposal; it cites no specific cases where delays encountered by extended FCC Construction Permits have resulted in significant adverse effects on the NAS. Absent such data, there is no basis for suggesting such changes. Conversely, it is clear that adoption of the proposal would have significant adverse effects on FCC permittees and licensees.

Instrument Approaches to Non-Public Airports. The Federal Aviation Act does not give the FAA authority to regulate airspace related to private use facilities. With the exception of airports open to public use (by air carrier and general aviation aircraft) and restricted government/military facilities (which have a “public” component) the FAA’s plan to protect the airspace associated with unpublished, private use IAP’s treads on the property rights of others and the jurisdiction of local governments through their permitting and zoning processes. While it may establish such approach procedures for private benefit, it must not let the existence of such procedures trump the rights of a broadcaster, for example, to erect on its property, a facility which is authorized/licensed to serve the public by the FCC. In such a case where a private use IAP exists, the FAA must alter the approach procedure to accommodate the structure or, if the conflicting uses are mutually exclusive with no compensating adjustments available, hold public hearings to determine which proposal best serves the public interest; to do otherwise would put the agency in the position of fostering a private enterprise with no direct public benefit over the interests of facilities licensed by the federal government to use public airwaves to serve the public.

Minor Facility Changes. Many FCC authorized radio facilities are permitted to make certain types of changes in their antennas without prior approval, subject to notification for the record subsequent to making these changes. This latitude is afforded because the FCC properly considers these changes to be of little or no significance in terms of electromagnetic

impact. Yet, the FAA is suggesting that it needs to review such changes and it will decide whether a proposed change will have an adverse impact requiring issuance of a Determination of Hazard to Air Navigation regardless of what the expert radio agency, the FCC, determines even though this process has been used successfully for decades without any cases of actual interference being reported by the FAA. This part of the FAA proposal is probably the most over-reaching and the need for it has not been established.

UHF Facilities. For years the FAA has “determined” that UHF broadcasters (in the frequency range of 470 – 806 MHz) would cause interference to FAA communications facilities in the range of 118 – 137 MHz. No amount of explanation by radio communications experts would satisfy the agency that such interference was virtually impossible from a properly operating UHF transmitter more than 300 MHz higher in frequency. The agency typically issued a “no hazard” determination with a “condition” of “no interference”. This usually required additional communication with the proponent and, of course, processing delay for naught. Apparently, the agency now agrees – after two or more decades of undue paper shuffling – that the industry was right as it is noted the UHF broadcasting band is not included in its list of frequency bands requiring notification. We concur and trust that this was not an oversight but rather an awakening to the fact that such requirements were – and remain – unnecessary.

Conclusion

The FAA has not demonstrated a need for the procedures it proposes to adopt nor has it provided even a scintilla of technical data or scientific postulation in support of its proposals.

Its own databases and those of the National Transportation Safety Board do not contain a single incident or accident related to the type of “interference” that it bases its proposal on; these publicly-available records span nearly 45 years (in the case of the NTSB

and 20+ years in the case of the FAA AIDS database) and the absence of a single reported incident affecting the safe outcome of a flight or aircraft operation is telling.

The FAA's continued use of technically flawed analysis tools in disregard of comments and advice provided by expert communications engineers and agencies does not speak well of its ability to be a spectrum manager for facilities/frequencies not under its purview and regulated by the expert communications agency, the FCC.

The FAA's impact analyses grossly understate the financial burdens and other effects on parties which would be affected by adoption of its proposed rules. Various parties have opined that these miscalculations range from a low value of approximately 200% to high value approaching an order-of-magnitude. AFCCE believes that the actual impact will at least an order-of-magnitude greater than that estimated by the FAA.

All of this to fix a problem that does not exist. To paraphrase an old colloquialism: if it is not broken, please do not fix it.

Recommendations


AFCCE recommends that:

1. This proceeding be terminated.
2. The Federal Aviation Administration monitor the FCC databases for proposals which it believes may impact aeronautical facilities/operations and "coordinate" with the FCC in such matters as mandated by Congress.
3. The Federal Aviation Administration convene an Aviation Rulemaking Advisory Committee (ARAC), as it has done on other aeronautical matters in the past, and invite members of the communications industry as well as aeronautical interests to participate.

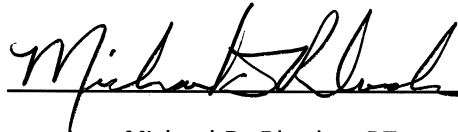
4. Charge the ARAC with analyzing whether a problem exists and, if so, recommending how it can be addressed including, if necessary, appropriately crafted and supported changes to the agency's rules through the rulemaking process.

Respectfully submitted,

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