

Examining U.S. Air Force Spectrum Management in the Continental United States

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ISSUE

The Department of the Air Force's (DAF's) ability to test, train, and operate in the continental United States (CONUS) is challenged not only by the increasing congestion of the electromagnetic spectrum (EMS) but also by DAF and federal administrative requirements because EMS-dependent DAF equipment must be certified and allocated to an increasingly limited spectrum, which requires long processing times. These challenges result in delays in deploying and training with spectrum-dependent equipment, ultimately challenging the DAF's technological edge in the EMS. In our research, we sought to answer the following key questions:

- What are the common U.S. Air Force (USAF) CONUS spectrum management processes and what technology is used for them?
- What are the root causes of delays in CONUS spectrum certification and frequency assignment?
- How can timelines be shortened for CONUS spectrum certification and frequency assignment processing?



APPROACH

We reviewed guidance documents for USAF, U.S. Department of Defense (DoD), and federal EMS management. In addition, we reviewed spectrum management training documentation and pipelines. We also conducted semistructured interviews and discussions with spectrum managers and EMS operations subject-matter experts at several operational commands, test ranges, and at USAF headquarters to collect input on procedures. Finally, we set out to analyze data from spectrum management systems to identify the sources of delays and their potential root causes.



KEY FINDINGS

- Each DAF guideline provides up to nine months to process spectrum certification and assignment submissions within the DAF; these submissions are generally completed within guidelines despite much manual coordination between DAF organizations.
- Although many of the certification submissions are approved at the DAF level within guidelines, they can still require up to three months of approval time at the federal level.

- The National Telecommunications and Information Administration processes more than 90,000 frequency assignment applications per year, and the DAF has no day-to-day insight as to the reasons for a delay or the pending length of a delay for a given submission.
- It is difficult to quantify and qualify delays in the DAF with precision because corrections and updates to certification and frequency allocation submissions often require manual work and because data on delays and their reasons is not automatically collected over time.
- There is no standard workflow across the DAF for processing spectrum certification and assignment submissions at the unit level. Overcoming delays requires coordination with submitters via email and telephone.
- Enterprise databases for spectrum management are managed by Defense Information Services Agency (DISA) for all service components and within the DAF, but federal agencies employ different spectrum management databases.
- DISA spectrum management technology does not produce automated reporting of certification and assignment delays, and DAF technology and workflows are not standardized.
- Overcoming delays in requests for frequencies for electromagnetic attack test and training is largely a manual process and can require coordination with commercial providers and such federal agencies as the Federal Aviation Administration and Federal Communications Commission.
- Spectrum management within the DAF is carried out by a mix of military and civilian personnel; the number of enlisted personnel and their training under a new cyber career field designator do not reflect the importance of the EMS to operations and potential future conflicts.
- Interactions between spectrum managers and certification and assignment applicants are often focused on correcting submission errors, which suggests that they share an unfamiliarity with standard forms and administrative processes, especially at the levels below major command.



RECOMMENDATIONS

We present the following DAF-focused recommendations that can be advocated for and implemented by the Air Force Spectrum Management Office with support from the Air Force Electromagnetic Spectrum Superiority Directorate:

- Establish a DAF-accessible record of delays, flag those outside reasonable guidelines, and describe their impact.
- Advocate for updates to DoD-enterprise spectrum management tools, such as Spectrum XXI, to identify DAF-wide and DoD problem areas.
- Develop and acquire technology that aids users and helps automate the certification and frequency allocation submission process.
- Establish DAF-wide standards for spectrum management technology and workflows for processing spectrum certifications and assignment applications.
- Develop new training materials for early career, enlisted spectrum managers that focus on developing core capabilities, such as spectrum expertise, process administration, and engagement with industry and operations.
- Develop DAF spectrum management community-knowledge management systems so that airmen have access to the most-recent and relevant information available to support the unique mission that spectrum managers have within their new cyber specialty designator.



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