

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554**

In the Matter of)	
)	
Fostering Innovation and Investment in the Wireless Communications Market)	GN Docket No. 09-157
)	
A National Broadband Plan for Our Future)	GN Docket No. 09-51

To: The Commission

COMMENTS ON NOTICE OF INQUIRY

The National Association of Manufacturers and MRFAC, Inc. (“NAM/MRFAC”) hereby submit their comments on the above-captioned Notice of Inquiry (“Notice” or “NOI”). The agency has posed numerous questions intended to gather information for possible improvements in its decision-making processes relative to innovative wireless technologies. NAM/MRFAC welcomes the opportunity to contribute their views on this important subject.

Introduction

The NAM -- representing an employment base of 18 million people manufacturing products in the United States -- is the nation’s largest and oldest multi-industry trade association. The NAM represents 14,000 member companies (including 10,000 small and mid-sized manufacturers) and 350 member associations serving manufacturers and employees in every industrial sector and all 50 states. Headquartered in Washington, D.C., the NAM has 10 additional offices across the country.

MRFAC is one of the Commission’s certified frequency coordinators for the private land mobile bands from 30 to 900 MHz. MRFAC began its operations 30 years ago as the frequency coordinating arm for the NAM. For the past two decades, MRFAC has operated independently,

providing coordination and licensing-related services for U.S. manufacturers and other industrial and business entities. MRFAC has long participated in spectrum rulemakings affecting the interests of manufacturers.

Background

The Notice opens with observations that wireless communications is increasingly important for the U.S. in the 21st Century. The purpose of the Notice is to help the Commission understand the factors that underlie innovation and investment in the wireless age, and “identify concrete steps the Commission can take to support and encourage further investment in this area” (*id.* at ¶ 1).

Among other things, the Notice observes that innovations can be subject to regulatory delays stemming from debates concerning the compatibility of a new service with existing users; and that a goal of the proceeding is to determine how to remove “any unnecessary impediments caused by the Commission’s policies and rules” (¶ 5).

At the same time, the Notice acknowledges that “the risk of interference is becoming a more acute problem” (¶ 34). It recognizes the importance that the noise floor has for resolution of spectrum policy questions, i.e. it is “particularly interested in how the noise floor ... affects the deployment and viability of services” (¶ 47). The Notice asks whether the noise floor is increasing, and whether the Commission should take steps to reduce it such as by tightening out-of-band and spurious emissions (*id.*).

The Notice also asks whether the Commission should seek some better definition than the term “harmful interference” in resolving interference issues (¶ 34); whether the agency “has a role to play in accommodating or fostering innovation in business models” (¶ 64); and whether alternative dispute resolution technologies such as negotiated rulemakings, or arbitration or mediation, might represent an improvement (¶ 35).

Discussion

At the outset, it is important to stress that innovation should not be viewed solely in terms of communications services and devices delivered to the public, such as cellular communications. While, of course, such services and devices are very important for our economy, there are a myriad of wireless devices which the public never sees, but which are essential factors in the production and delivery of new and innovative non-communications goods and services which the public does see. These devices are no less deserving of concern and focus for the Commission as part of this proceeding.

For example, a typical large manufacturer may employ numerous specialized radio systems ranging from those for confined hazardous areas, to those for overhead crane control, voice dispatch, transportation, HAZMAT, emergency fire and medical, telemetry systems, and a wide variety of Part 15 unlicensed devices, such as 2.4 GHz WiFi units. These systems fulfill critical safety and productivity functions for the design, production and delivery of an enormous array of products for the U.S. and global marketplace. Additional information on manufacturers' use of wireless facilities is set forth in the Attachment.

U.S. manufacturing productivity has steadily improved over the past 25 years, and that productivity continues to improve. Between 1979 and 2005, productivity improvement has averaged 4.1 percent per year. From 2006-2007, it increased to 4.7 percent per year. This rate of improvement is better than all but three of the 17 nations historically evaluated by the Bureau of Labor Statistics (BLS News Release, March 3, 2009). Wireless networks facilitating just-in-time delivery, for example, have been vital in bringing about these improvements. These wireless systems have been also a material contributor to the global competitiveness of U.S. industry.

The Notice invites comment on the impact of regulatory certainty and flexibility in promoting innovation and investment (§ 11), and how “interference protection considerations

affect innovation “ (¶ 34). There is no question but that clear and settled rights are important to new entrants, just as they are important to incumbents. Without such rights, the owner of an asset will have little interest in risking the investment capital necessary to develop the asset. This is no less true for the development of a spectrum asset than it is for development of real estate.¹ Manufacturers have invested many hundreds of millions of dollars in wireless technologies in reliance on those rights. So also, new entrants need to understand the parameters of the rules under which they are looking to risk an investment.

Given the reliance interests at stake, the Commission should continue to be careful in its approach. More specifically, the burden of persuasion should and must remain on the new entrant to demonstrate compatibility with existing licensees. This is true generally, but especially in cases where interference can lead to major disruption to industrial operations. For example, interference disrupting a just-in-time component delivery system feeding an automobile assembly line is measured in tens of thousands of dollars per minute.

The Commission’s role as “traffic officer” in monitoring spectrum law and order remains at the heart of the agency’s mandate.² This mission is of vital importance, even more so now than at the time of the Radio Act of 1927. As the agency charged by Congress with fulfilling this mission, there is no magic formula by which the agency can resolve complex and often contentious interference compatibility/spectrum sharing issues. However, it does seem to NAM/MRFAC that there are some modest steps the Commission could take.

First, the Commission should seek to significantly enhance the resources of the Office of Engineering and Technology as well as of the Enforcement Bureau. The mission of both

¹ See generally R.H. Coase, *The Federal Communications Commission*, II *Journal of Law and Economics* 1 (1959) at 14.

² See *id.*, at 13 quoting from *National Broadcasting Co. v. United States*, 319 U.S. 190, 213, 215-217 (1943).

conduces to better-defined and enforced interference rights, a situation which benefits new entrants as well as incumbents. OET labors under resource handicaps which can limit its ability to take a more proactive role in resolving difficult technical issues. If OET were able to hire more engineering personnel, for example, it might be better able to help resolve some of the debates surrounding complex spectrum sharing issues. Likewise, a beefed-up enforcement regime would help ensure that once Rules are set, they are followed. This too will enhance new entry and incumbent operations, and thereby encourage innovation since, if one thing is clear, markets hate uncertainty, most especially uncertainty affecting protections afforded by the Commission's technical rules for co- and adjacent-channel interference. Accordingly, NAM/MRFAC urges that the Commission approach Congress with an eye toward enhancing its budget for both OET and EB.

Second. The Commission must remain vigilant to protect the radio environment. While many bands are interference-limited, such as the PCS bands, others, particularly bands Restricted under the Commission's Rules (Section 15.205), are noise-limited and must remain so for the protection of the sensitive operations conducted therein. A clear focus on the need for new entrants to be "good neighbors" by means of appropriate OOB and spurious emission standards will remain important and, in some instances, the Commission will need to consider tightening the standards in order to preserve, if not even reduce, the noise floor.

Frequency coordinators can play a constructive role in reducing the chances for interference as between an existing and a new user. However, coordinators can only apply the Rules that the Commission has adopted: Unless appropriate rules are in place to limit co- and adjacent-channel interference, the noise floor will inevitably rise to the detriment of noise-limited and interference-limited services.

Third. There is no “silver bullet” criterion for the resolution of what constitutes “harmful interference” (§ 34). Such determinations necessarily turn on a case-by-case review of the interference that would be inflicted on the incumbent service, and the nature of that service, i.e. whether it is a safety service or not. Because resolution of such issues is so fact-specific, it would not be practical to define some one criterion to determine what is, or is not, harmful interference in all cases.³ On the contrary, a case-by-case determination goes to the heart of the Commission’s job.

To be sure, rulemakings can be long and laborious. But the Commission has relatively little flexibility to pursue other solutions given the Administrative Procedures Act and the long line of cases construing the Commission’s responsibilities thereunder.⁴

Finally, the Commission has neither the competence nor the jurisdiction to insert itself into the development of entrepreneurs’ business plans. Rather, the Commission should continue to focus on the development of rules of the road, i.e. interference protections, rights and responsibilities. In doing so, it can best facilitate the growth of innovation in the wireless arena.

³ The Commission seems to recognize as much at note 32.

⁴ See generally, *Greater Boston Television Corporation v. FCC*, 444 F.2d 841, 850-853 (D.C. Cir. 1970).

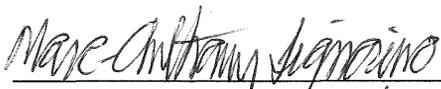
Conclusion

For the foregoing reasons, NAM/MRFAC urges that the Commission consider requesting additional funds to enhance its vital spectrum policy and enforcement operations, and be vigilant to ensure that new entry does not lead to an increase in the noise-floor for either co-channel or adjacent licenses.

Respectfully submitted,

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NAM/MRFAC Presentation:

The Role of Wireless Technology in Manufacturing Productivity and Safety



US Manufacturing Productivity

- Over the past 25 years, U.S. manufacturers have outstripped most of the competition in output per worker hour. Between 1979 and 2005, U.S. productivity gains averaged 4.1% per year (Source: Managing Automation, November 20, 2006).
- U.S. manufacturing productivity continues to grow. Between 2006-2007, the gain was 4.7% which was better than all but three of the 17 nations historically evaluated by the Bureau of Labor Statistics (BLS News Release, March 3, 2009)
- Experts believe that future improvements will focus on maximizing the efficiency of, and hence the return on, manufacturing assets rather than further reducing headcount (Source: Managing Automation)
 - *e.g.*, instead of long, steady production runs, assembly processes will be increasingly shifted to meet spikes in demand for particular products.
 - *wireless networks, both licensed by the FCC and unlicensed, will be critical components in achieving these productivity gains (id. at p. 4).*

The Importance of Wireless in Manufacturing

- Wireless automation boosts productivity by eliminating the need to manually note information and then subsequently input that information into a computer system.
- Data moves faster and more accurately through a business' supply chain, connecting salespeople and customers with shipping and receiving, the warehouse, the factory floor, vendors and partners.
- Wireless data collection and bar code scanning eliminate errors in the production process, increasing product quality. Mobile asset maintenance ensures maximum uptime for machinery.
- Wireless-equipped technicians can wirelessly access the entire maintenance history for a specific piece of machinery, increasing asset uptime and savings. Unscheduled stop in assembly lines can cost tens of thousands of dollars.

(Source: Symbol Technologies)

Examples of Wireless-Enabled Manufacturing

- Automotive Industry

- Error Proofing – operators physically scan parts prior to use with handheld computers, enabling operators to instantaneously verify if the part is correct.
- Asset maintenance ensures that equipment is timely serviced using correct maintenance routines. Tools and parts can be automatically reserved to ensure availability on the day a certain piece of equipment is scheduled for service. (Source: “Symbol Technologies, supra” at p. 60-62).

- Aerospace Industry

- Error Proofing and Traceability – mobile automation reduces errors in the manufacturing process by: 1) ensuring that the correct parts are used at every stage of the assembly; 2) providing a complete audit trail of parts, enabling the rapid location of any faulty parts in assembled/delivered aircraft; and 3) providing complete installation history.
- Mobile Field Service –manufacturers can provide service engineers with instant access to everything from a list of services to be performed, to mechanical drawings, specific instructions, and a step-by-step check box. (Source: *Id.* at p. 63-64).

Manufacturers' Radio Use is Specialized

- Materials handling
- Plant security
- Emergency medical
- Confined space
- Remote control
- Spark-free
- Telemetry
- Just-in-time
- To name a few

Regulatory Background

- Private land mobile radio (“PLMR”) licensed by FCC under Part 90 of its Rules
- Unlicensed spectrum authorized under Part 15
- Principal licensed mobile radio bands:
 - VHF (72-76 MHz and 150-170 MHz)
 - UHF (450-470 MHz) (plus 470-512 MHz in a few areas)
 - 800 MHz
 - 900 MHz
 - 1.4/2.3 GHz
- Principal Unlicensed Bands
 - 902 – 928 MHz
 - 2400 – 2483.5 MHz
 - 5150 - 5350 MHz
 - 5470 - 5725 MHz and
 - 5725 – 5850 MHz

- VHF and most UHF channels shared.
- 800/900 MHz and 470-512 MHz channels exclusive
- Shared channels coordinated by MRFAC and other entities certified by the FCC for this purpose
- PLMR channels licensed on a site-specific basis, rather than auction/geographic area
 - Since manufacturers are looking to serve their own internal needs, rather than consumers, FCC's predetermined geographic areas do not work for PLMR licensing

Typical Large Company B/ILT Radio Facilities



Typical Radio Services Support

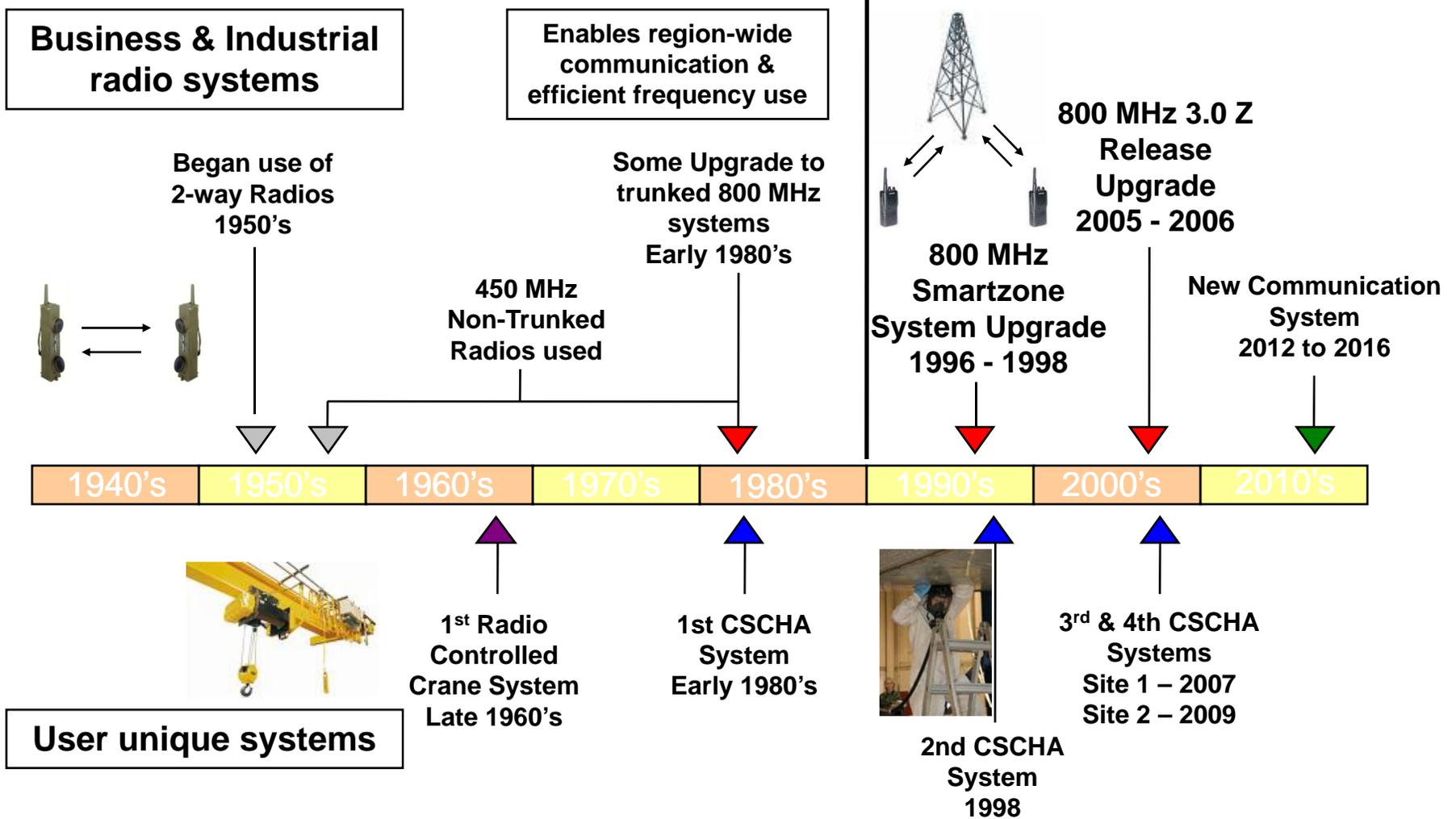


Varied Radio Applications

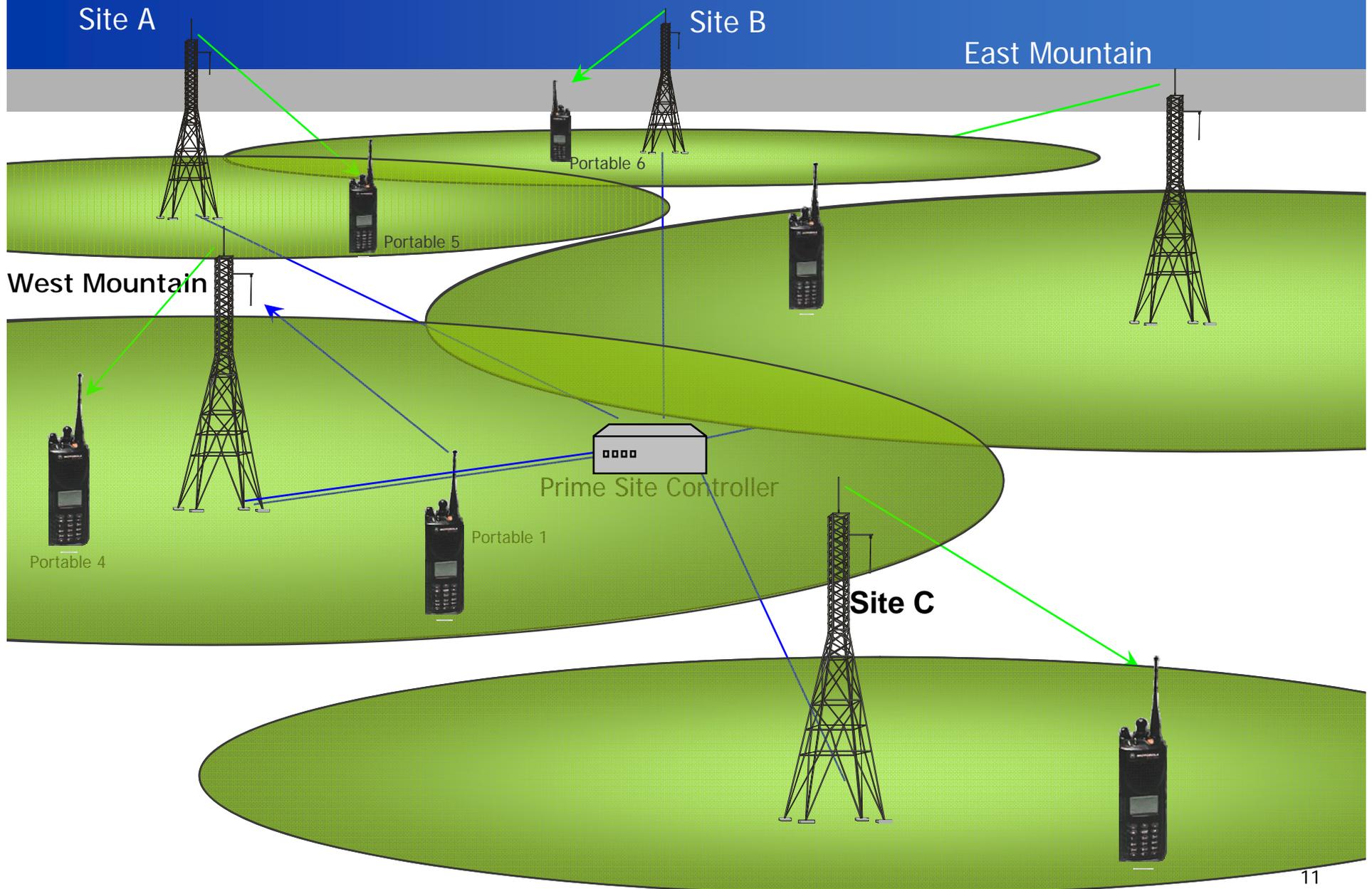
- CSCHA Safety Radios
- 72/75 MHz RC Cranes
- 150 MHz Facilities Comm
- Emergency Operations Center (“EOC”) 450 MHz Radios
- 450 MHz Lic. Transportation
- 800 MHz Fire/Security
- Various Unlicensed Systems



Typical Radio Services Radio Usage Timeline



800 MHz Simulcast System



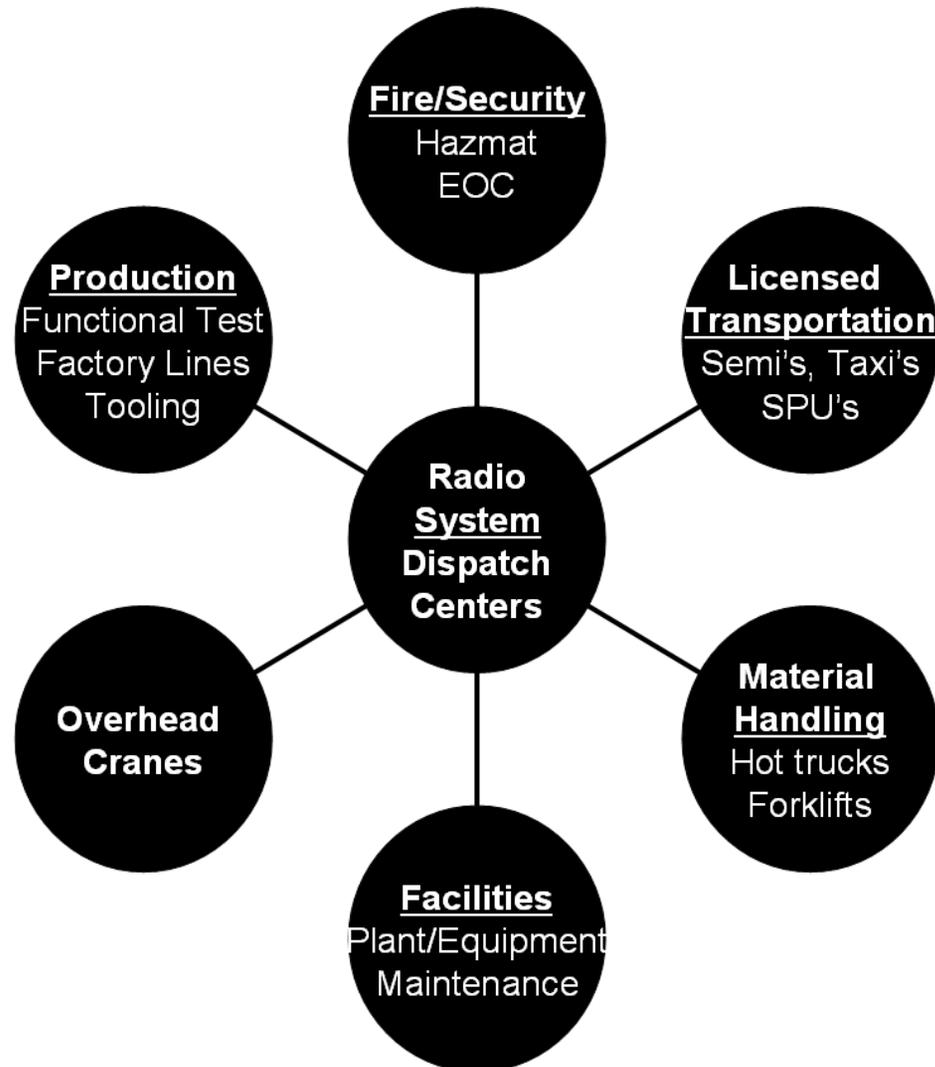
System Statistics

- 11K+ Total Unit ID's
- 10K+ Active ID's
- 52K+ PTT's per day



- Dispatch (One to Many) Operation
 - Multiple Dispatch Centers
- Direct Radio contact with
 - Headquarters Office
 - Washington DC Office

Multiple B/ILT Radio Users



Multiple B/ILT Radio Users



Radio Subscriber Units



Multiple B/ILT Radio Users



Site A Production - 42.7%
Site B Production - 61.4%

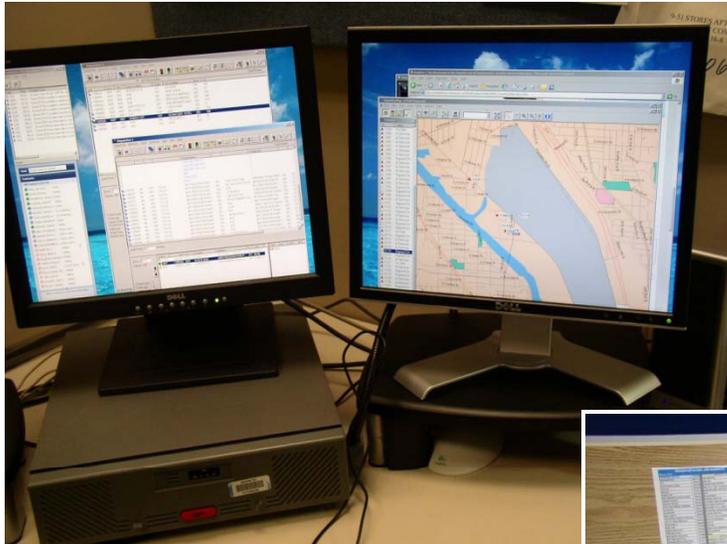
Fire / Security



571 Voice Radios
100 EOC Radio



Transportation



128 Data Radios
294 Voice Radios



Material Handling

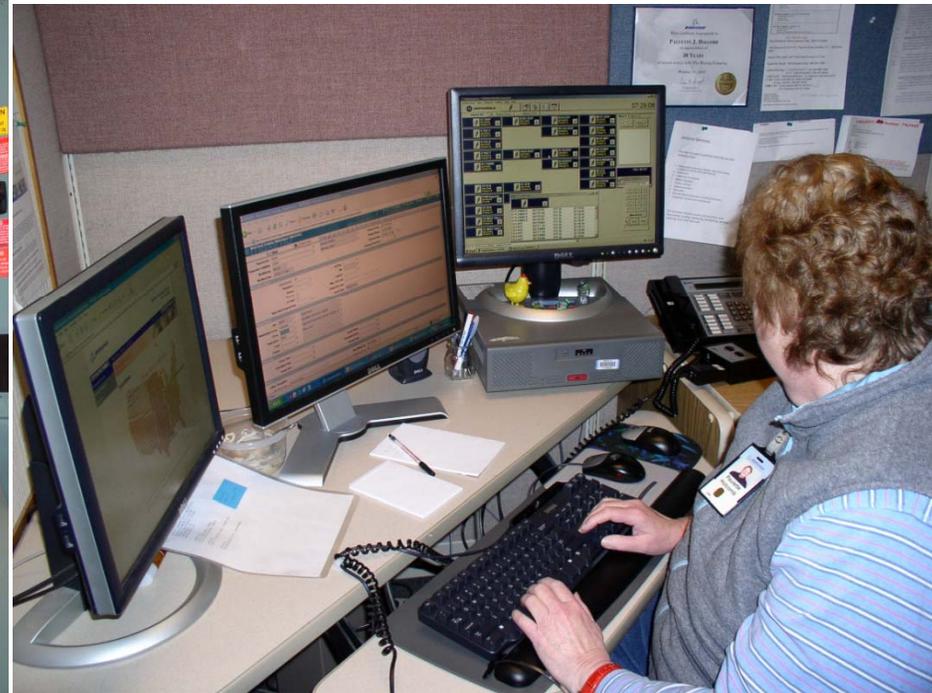
Over 300 Voice Radios



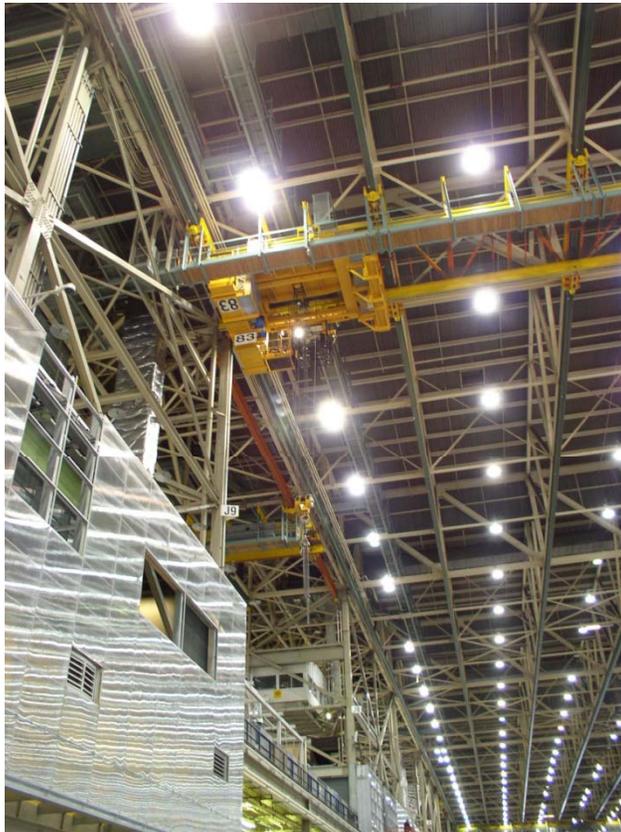
Plant & Equipment Services



Over 2000 Voice Radios



Overhead Cranes



Approximately 270 Voice Radios

