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November 20th, 1986

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Genga Arulampalam, Rapporteur

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Henry Geller - Duke University

At the start of the presentation Geller briefly defined the terms Allocation, Assignment, and Authorization as they fit the topic for the day. Allocation he said, means the blocking out of part of the radio spectrum for a particular purpose like service functions. Assignment, in effect is the nature of the rules of the game (i.e. the rules applicable to a particular service after an allocation has been made). Authorization involves the reviewing of applications and granting specific permission to a particular individual/organization to use that spectrum.

Geller then discussed the procedural aspects of allocation, assignment, and authorization as specified by the Communications Act of 1934 and the Administrative Procedures Act of 1946. In describing the process he called it "informal rule making" - when a rule is proposed, the public is allowed to comment orally or in writing. However, unlike a trial, the Agency is allowed to even go outside the record and gather information. On the issue of substance, he said, the court is very reluctant to upset what the Agency has done. Since it is not the legislature, the court only rules on the arbitrariness of the rule. As a result of this process, judicial review of rules is loose as to substance but tight on the procedure to be followed. Once established, and printed in the Federal Register, the rule takes effect in 30 days or after.

Commenting on the substance of the legislation, Geller

noted that what was introduced in the 1920s was refined in the 1927 Act and repeated in the 1934 Act. The content is similar to that used in many other Administrative Agency Acts, and gives the Agency enormous leeway. This, he said, was quite desirable particularly from the Congress' point of view, because the fields are very dynamic, and given to rapid change.. The idea therefore is to give the Agency a broad grant of discretion to enable it to change quickly, in step with technology, without having to return to Congress for new legislation.

Analysing the allocation of spectrum using broadcasting as an example, he said the first decision to be made is related to the allocation of channels for local service verrsus national service. While there have been comments that allocating spectrum on a local basis is foolish and wasteful, that is the direction chosen by the Agency Another decision he discussed was the amount to be allocated oesides local service. Though there are many claimants for a particular spectrum, the Agency, he said, had set aside an enormous amount of spectrum for broadcasting on the basis that broadcasting makes a large contribution to building and maintaining an informed electorate. However, Geller asserted that the Agency does not follow through on the allocation (when users come up for renewal) to adequately ascertain whether they actually provide a service that contributes to an informed electorate. Without follow-up, he said, megaHertz of spectrum could be wasted. Another issue addressed by Geller, was the spectrum separation which in this country is 10 KHz, whereas the rest of the world uses a 9 KHz

separation. Using lower spectrum separation could yield more space for additional channels which could in turn be used for valuable additional broadcasting.

A further issue discussed was the technical issue of positioning TV broadcasting. In 1945, though the Commission realized that it was not feasible to go ahead with VHF for nationwide TV, it was persuaded by RCA to go ahead with VHF. However, UHF had the advantage that it had many outlets (70) and allowed room for a lot more competition. It also did not interfere with government use which was predominantly in VHF. By 1948, realizing the difficulties, the Commission froze television grants when the number of VHF stations was only 37. But it continued to grant licenses to earlier applicants thereby increasing the number of stations to 108 by 1952 when it lifted the freeze with an intermixture of VHF and UHF. Because this mixture was soon seen not to work, everything should have been moved to UHF. But the FCC wanted to protect the UHF broadcasters so it failed to act. In all these decisions Geller pointed out how the Agency, though intending to act in the best interest of the public, was captured and pressured by the industry to make decisions that were contrary to the public interest.

Geller next went on to describe and discuss the three methods of authorization; comparative hearing, lottery, auction. Comparative hearing is a method that has been used for the longest period. However, he said that, it just does not work because it is impossible to review and decide comparative merits on the basis of each claimant's proposal. The lottery system has been used since the early 1980s. Though it is better than

comparative hearing, it tends to act more like a sweepstake - attracting a lot of people (even some who don't have any genuine interest in the facility except that of cashing in on the demand) who subsequently sell-out to the highest bidder. In this context he cited Metromedia which won the permit for cellular systems and eventually sold out to Southwestern Bell for about $1.2 billion. Auction, he said, is by far the best method where the market decides the winner. The funds recovered could also be put to good public use. However, despite repeated requests Congress, he said, has yet not got around to granting its approval for the use of the auction method.

Geller then turned his attention to other issues related to spectrum management. Firstly, he discussed the dual allocation process that operates under the existing system. The FCC is authorized to allocate spectrum and so is the President (for Defense and similar purposes). As a result, both have to work together and spectrum has to be shared. In practice this sharing, he said, becomes rather difficult particularly because of the large clout wielded by the Defense Department (DOD). For, the efficient use of spectrum by the DOD cannot under this dual system be monitored and compared with the public use of spectrum. As a result, spectrum tends to be less efficiently utilized in defense than in public use. As a solution to this problem Geller suggested the establishing of a single entity, like a Department of Communication as is the case in Canada, the chief of which shoulf be appointed by the President. Such an institution would be responsible for the allocation of spectrum for defense as well

as public use.

Another issue he touched on briefly was the free of charge allocation of spectrum which eliminated the incentive for more efficient use of spectrum. He suggested the importance of this problem and added that the second speaker (Marcus) would comment on it further. An additional issue that Geller commented on was that of technical standards. The dilemma here, he said, is whether a standard should be specified or allowed to go to the market for selection. The problem in specifying is that the government is liable not to do it well, and once it is done the users will be stuck with it. In situations where there is no difference between the various options (e.g. teletext) the Agency could just select one at random. However, if technology is changing rapidly it would be best to let the market decide on a standard.

Finally, Geller discussed the need for more flexibility. Rule making, he said, causes significant delays which adversely affect the introduction of new technology. In this regard he compared the area of communications with computer technology. In the latter field, one can go to the market with a new product without any delays thus capitalizing on the special features of the product. However, he said, in the area of telecommunications "the secret of the new product is blown" while going through the whole process of obtaining permission. As a result, the inventor of the new product/ process often is unable to maximize the benefit of first entry to the market. As a solution to this problem Geller suggested a form of experimental licensing and/or experimental frequencies to be to be utilized

for the introduction of new products.

In closing, he commented that in the fast approaching information age the computer field is making rapid progress. However, he said, regulations the way they are at present restrict the use of telecommunication channels which are necessary as a support system to this advancement in the computer field.

Michael Marcus - MIT (on leave from FCC)

Marcus at the start of his presentation asserted that the classical regulation of telecommunication in this country over the past 50 years may have had an inhibiting effect on technological advancement. This impact on innovation may be seen, he said, in three different areas:

- Evolution of existing radio systems
- brand new uses of radio
- non-radio systems involved in telephone companies

Traditionally, he said, FCC technical rules/standards have been prescriptive in nature. The history of this, he said, goes back to the time the FCC was started in 1934 when there were very few technical options available for building radio systems. FM was brand new at that time and AM was essentially the only modulation that was well known. Also, in 1946, following the introduction of the Admistrative Procedure Act, Congress set up one set of standards (for rule making) applicable to all 200

regulatory agencies.

As an example of the difficulty of prescriptive rules Marcus showed a slide of the FCC rules dealing with TV broadcasting right from its inception. In it he pointed out the 14 amendments made to the rule over the 20 year period 1963-1983. As technology developed, every time an improvement came about for TV broadcasting the rules had to be changed following the long drawn out rule making procedure. The question, he said, that arises is what benefit accrues to the government from going through this whole process of rule making. Why not let the broadcasters decide provided they don't interfere with each other?

Marcus discussed the need for rule making action in relation to new technology including existing licensees. In this context he described the approach adopted by the Agency with regard to developing appropriate rules for such new technologies as FM subcarriers, AM stereo, AM digital subcarriers, and digital land mobile terminals. The problem, he said, in all four of these examples is that the existing licensee is delayed by the inaction or slow action of the Agency. He pointed out however, that the Agency had become a lot more responsive to these needs over the last three to four years. As for rule making with regard to completely new innovations the situation, he said, is a lot more complicated. As an example he cited the system called XTEN, a digital termination service developed by Xerox. Xerox, he said, obtained approval in record time (1 1/2 years). However, it cost them legal fees in the region of $0.5 - $1.0 million. Unfortunately this degree of financing is not available

to many smaller innovators. A smaller company cited by Marcus was LO-JACK which developed a car theft system for police identification. They succeeded in obtaining an interim spectrum allocation by negotiating with the FBI to use one of its spare frequencies. As a result, they effectively bypassed the FCC. Discussing the problems faced by innovators, he highlighted the difficulty smaller new businesses had in raising adequate finance for this environment.

An additional factor faced by radio technology companies is the risk faced by the company in that the government can cancel/withdraw experimental licenses overnight without the right of appeal. This not only inhibits investors but also threatens potential customers.

Generally, he said, there is great difficulty in using administrative rule making to resolve issues relating to technical standards - especially in contentious cases. In addition, the lack of predictable market access may tend to discourage capital formation, and research and development. Further, user design decisions could be restricted, from an efficiency point of view, by the relevant apparent value of spectrum and radio hardware. Marcus quoted from a 1959 article by Prof. Coase recommending the use of market price mechanisms for eficient spectrum allocation, and noted that there had been little progress in this regard in the intervening period of almost three decades. He added that while the optimum way to find spectrum space for a new use might be to improve the efficiency of existing users that have low efficiency and low

marginal improvement costs, there is no present mechanism to do this

Moving onto telephone and common carriers, Marcus stated that the structural constraints that exist are based on technology as at present, with reasonable projections for the future. In addition, there is a general reluctance to change rules unless there is clear indication that technology has changed. However, the other side of the coin is that companies like AT&T or the Bell Operating Companies are reluctant to experiment with field trials since waivers are time consuming and require detailed technical disclosures. He cited the field trial example of the Elie Experiment in Canada where normal twisted wire was replaced with fiber optic cable. Similar experiments were conducted in some West European countries (including the UK) but not in the US, most probably he said, due in great part to regulatory barriers.

Finally, Marcus addressed the issue of what could be done to alleviate the problems mentioned earlier. He suggested that existing licensees be granted technical flexibility to use the allocated facility for any purpose that fits the general criteria of the original allocation. With regard to spectrum allocation, he suggested that granting licensees property rights would not only allow technical flexibility but also provide for greater efficiency. He further highlighted the need for a coupling of engineering research and telecommunications policy in order to achieve coordinated and effective end results.

Speakers' Comments and Answers to Questions

Geller emphasized once again that spectrum allocation is the backbone and most important part of spectrum management. He added that greater efficiencies should be sought in spectrum allocation and use. He identified as a basic problem the current system which required radical change to be effective. He lamented that the "expert agency" had really become a dumping ground with too few technologists and economists but rather it is dominated by lawyers and bureaucrats. Marcus added that the problem in the FCC may be the political nature of much of its jurisdiction. He cited as an alternative example the Canadian communication regulatory system which distinctly separates political and technical issues. Geller further added that unlike the SEC and the Federal Reserve (which have technically qualified people) the FCC is burdened with disappointed Congressmen etc. who stay with the Agency for a few years and then go into the industry. As a result, they don't like to antagonize the industry with rulings that adversely affect it. He also communicated his pessimism about the possibility of changes to the current system because he said, it appears to be the industry that "calls the tune."

A member of the audience commented that a possible reason for delayed rule making is the rapid advance of technology. As a result, he said, it may be better to sit back and wait instead of locking into something that will not work too well in the future. Marcus cited the example of the VCR where

the original Betamax is different from VHS or the current Betamax. If the government had fixed a standard, he said, in the early days of VCR we would have been stuck with the original Betamax. Geller added that one has to look at the situation and judge whether technology is moving fast or not and then act accordingly. The best course of action, he said, is to let the market decide.

A comment was made that the presentations gave a bleak picture of the FCC with the Agency functioning merely as a "registry". The question was asked as to where the FCC was headed and to what kind of future. Marcus responding said that the FCC is needed particularly to handle spectrum allocation. However, he suggested that in about half a century the system might be deregulated altogether.
