

REGULATORY AND POLICY ISSUES

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1. Introduction

The development of fiber-based broadband networks is creating much excitement in the telephone industry as both carriers and users envision new telecommunications services and applications unbounded by bandwidth or transmission limitations.¹ But before carriers will be willing or able to make the substantial investments necessary to bring these new networks out of the laboratories, a number of regulatory and institutional barriers will have to be overcome.² At the same time, the development of broadband networks raises many difficult policy questions about existing regulatory and institutional arrangements.

While it appears that large users will have access to high-speed broadband networks in the near future, whether integrated broadband networks (IBN) — and the new or improved services they might support — will be available to small business and residential customers is an important public policy question. This chapter identifies regulatory and policy questions that must be answered if the promise of these new networks is to be achieved. It is important that these questions be addressed, because the existing regulatory framework is ill-equipped to cope with the potential economic, political, and social implications of technological changes that have already begun.

Whether barriers are overcome and IBNs are rapidly deployed, or the barriers remain and IBNs evolve over a longer period of time, these new networks will eventually become available to significant portions of the nation. As they begin to be deployed, they will severely strain existing regulatory practices. The policy and regulatory implications of broadband network development are potentially so significant that the present way of conducting regulatory business will be challenged and many existing rules and regulatory practices may become superfluous or counterproductive.

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This challenge will arise whether or not telephone/cable cross-ownership restrictions are modified.³ For the most part, the questions and issues raised here deal with common carrier regulation in an integrated broadband environment. Whatever the outcome of the telephone/cable cross-ownership debate, policy makers will have to address and answer these questions raised by IBN deployment.

This chapter identifies eight areas of regulatory questions or issues regarding IBN deployment: state/federal jurisdiction; pricing and cost allocations; network design and terminal equipment rules; appropriate regulatory safeguards; carrier First Amendment rights; audiotex censorship; copyright; and social policies.

2. State/Federal Jurisdiction

Today's procedures for assigning regulatory jurisdiction will have to be reexamined in light of IBN development. Currently, all regulatory aspects of channel service are preempted by the federal government (i.e., the Federal Communications Commission).⁴ As IBNs develop, the question of whether channel service should, or could, remain a preempted service will have to be addressed.

In the past, channel service has been provided by telephone companies building a separate coaxial cable network and leasing it to the local franchised cable operator under what looked very much like a special construction tariff. The regulation of channel service was preempted by the FCC because traditional cable television service was based on the retransmission of over-the-air television signals deemed to be interstate by the Communications Act.⁵ The Commission's decision was challenged on the grounds that channel service was exempt from FCC regulation because of the intrastate reservation of Section 2(b) of the Communications Act.⁶ The Court of Appeals upheld the Commission quoting from *United States v. Southwestern Cable Co.*: "The stream of communication is essentially uninterrupted and properly indivisible. To categorize respondents' activities as intrastate would disregard the character of the television industry."⁷ The Court also rejected claims that channel service was "telephone exchange service" exempt from Commission jurisdiction but on the basis that "clearly, CATV channel distribution service does not contemplate furnishing subscribers with 'intercommunicating service' of the type usually identified with a telephone exchange."⁸ Of course, as cable operators offer "intercommunicating" services, the courts may reinterpret this application of the Communications Act.

Important jurisdictional questions are raised by the Section 214 approval process itself. Today, if a LEC wants to offer channel service it must receive Section 214 approval from the FCC.⁹ However, if the local broadband network is built, cost justified, and "proved in" for POTS, based on a local carrier's state authority to construct facilities, no federal approval would be necessary. Suppose the carrier upgrades the system to provide broadband transmission and offers channel service or its own video programming if the cross-ownership rules are relaxed. Is federal approval needed? At

the moment, the answer appears to be yes, at least for the facilities required to provide channel service. But what about future changes which may be only software upgrades? At what point will requiring federal 214 approval be merely perpetuating a fiction that is no longer technologically sustainable — that there are directly identifiable and assignable costs associated with providing broadband transmission for cable channel service distinct from other broadband services?

The fundamental question is whether channel service on an IBN should remain a federally preempted interstate service when other broadband services presumably will not be federally preempted? It could as easily be viewed as an interstate access service or even a local service to be regulated by the states. In a digital world, how will regulators be able to distinguish one service — or bit stream — from another? At a recent NARUC meeting, state regulators passed a resolution calling for state control of fiber networks¹⁰, as did the Florida Public Service Commission in comments to the FCC on telephone/cable cross-ownership.¹¹ As IBNs are deployed, will some be regulated by the states (with costs allocated to intrastate accounts), while others are regulated by the FCC (with all costs in interstate accounts), depending on whether video programming is offered at the time of construction? Such an outcome makes no sense from a regulatory or public policy point of view. Such an arrangement may present opportunities for carriers to “game” the regulatory process and shift costs from one jurisdiction to another.

3. Cost Allocations and Pricing

Questions about cost allocation and the pricing of services are difficult enough today.¹² They will be more difficult in an integrated broadband environment when each customer is served by a gigabit or terabit optical fiber the use of which is dynamically reconfigured as the customer uses different services and facilities. It may become impossible to define or distinguish between services in a high-capacity digital world. Existing methods of measuring relative use become meaningless in such an environment.

Traditional channel service is supplied by a separate facility for which most costs can be directly assigned and for which the Commission requires separate books of account.¹³ The price charged for the service is usually the result of negotiations between the telephone company and the cable operator rather than some cost-based tariff. Integrated voice, data, and video over broadband networks will be much more difficult to cost and price using today’s procedures.

Jurisdictional Separations and Cost Allocation

Today, all costs incurred by LECs are subject to a process called “jurisdictional separations” which divides the costs between the interstate and intrastate jurisdictions. As with Section 214 approval and federal preemption, questions of how to allocate

network costs between the federal and state jurisdictions are among the most difficult raised by IBN development. They are difficult because they are largely arbitrary, driven more by political considerations than by conceptual principles.

Virtually all costs and revenues associated with operating a regulated LEC — especially Class A companies with over \$100 million in regulated telecommunications revenues — are subject to Part 32 of the Commission's Rules, the Uniform System of Accounts (USOA).¹⁴ Costs and revenues for unregulated activities are segregated out on the basis of each carrier's Cost Manual, approved according to procedures adopted in the Commission's *Joint Cost Proceeding*.¹⁵ Once all costs and revenues have been assigned to specific accounts, they are "separated" between the federal and state jurisdictions according to procedures specified in Part 36 of the Commission's Rules.¹⁶ Finally, Part 69 of the Commission's Rules specifies criteria for assigning interstate costs to various interstate access and non-access accounts.¹⁷ The rules for assigning costs to access accounts are very specific. Costs left over are assigned to a residual non-access category. Costs associated with non-traffic sensitive (NTS) plant are allocated 25% to the interstate jurisdiction.¹⁸

As noted earlier, channel service is a federally preempted and tariffed service. Therefore, all costs associated with channel service are supposed to be allocated to the interstate non-access accounts as a result of following Parts 32, 36, and 69 of the Commission's Rules. This is possible in a world of easily identifiable and directly assignable costs when channel service is provided by a separate plant. But what happens when channel service is only one of many dynamically expanding and contracting uses of a gigabit — or terabit — fiber into the home? Will there have to be bit meters and special studies to determine the average number of interstate and intrastate bits — especially when costs are nonvariable?¹⁹

Pricing

The arbitrary nature of rate-base rate-of-return ratemaking, where tariffs are cost-supported by the attempted assignment of costs to "cost causers," will become even more apparent if such regulation is applied to tomorrow's IBNs. Voice telephony and broadband video transmission are so different that any attempt to price them using the same procedures or measures will likely prove futile. For example, if the future fiber network to the home has a gigabit capacity and a voice telephone call will use only 64 kbps or even 32 kbps, there will be a lot of capacity left over — something on the order of one billion minus 64 thousand. If a television signal will require 45 Mbps (or 150 Mbps if it is high-definition television) and local telephone service is priced at a penny a minute (the marginal cost of an intra-LATA call), a two-hour movie would cost \$843.75 just for transmission.²⁰ Alternatively, if the broadband video transport is priced at a flat rate of \$15 per month (comparable to basic cable television rates today), then flat rate local telephone service would be priced at two cents per month.²¹

The notion of trying to set prices based on some measure of relative use becomes even more absurd if they are based on a combination of throughput and minutes-of-use

patterns. The average residential telephone is used only about 23 minutes each day while the average television set is on approximately seven hours daily.²² If relative use is based on time and throughput, the \$15.00 per month basic video charge would translate into flat rate telephone service of one-tenth of a cent per month.²³ The easiest pricing solution may be to price access to IBNs on a flat rate basis at a level comparable to today's flat rate local telephone service and cable television service combined.²⁴

The issue of relative use raises another important technical/policy question. Television viewing patterns differ significantly from residential telephone calling patterns. It has already been noted that use of the average television set is more than 18 times that of the average residential telephone. There is another important difference. Local telephone usage is distributed throughout the day with much of the residential calling at different times from peak business use. Today's telephone network is engineered to reflect this traffic distribution and to minimize costs — if everyone tried calling at once, the network would become overloaded and most callers would get a busy signal. Television viewing patterns are different. At 9:30 on the average winter evening, about 68% of the homes in America are watching television.²⁵ For special events, such as the SuperBowl, viewing is even higher. The IBN of the future may use extremely fast packet switches but, until it does, it will require a capacity far exceeding that of today's switches.²⁶ And that leads to questions of how to pay for and allocate the costs of the new technology.

4. Network Design and Terminal Equipment

Another difficult regulatory question is how to prevent rules developed to protect competitive terminal equipment markets in a copper-based POTS and narrowband data environment from dictating technological solutions in an integrated broadband fiber optic environment. Rules designed to govern an analog electrical network will have to change in a digital optical environment, or run the risk of skewing technological development. As the fabric of the network evolves and takes on some of the functionality of customer premises equipment (CPE), functional distinctions between terminal equipment²⁷ and networks blur.

The Commission opened the CPE market to competition beginning with its *Carterfone* decision limiting carrier restrictions on terminal equipment to those necessary to prevent technical harm to the network.²⁸ In 1975 the Commission created its Part 68 registration program under which any user may connect any terminal equipment to the network as long as the equipment is registered with the Commission and will not harm the network.²⁹ In the *Second Computer Inquiry* (Computer II),³⁰ the Commission detariffed embedded CPE owned by AT&T³¹ but required that it be provided through separate subsidiaries. The Commission then established nonstructural safeguards under which AT&T and the BOCs could offer deregulated CPE.³²

Network Channel Terminating Equipment

A type of CPE called network channel terminating equipment (NCTE) has presented particular problems for the Commission as it has deregulated CPE, and the advent of fiber optic IBNs is likely to further complicate the situation. NCTE is a generic term for devices located on customers' premises that provide an interface between the network and terminal equipment and perform functions that support digital communications. NCTE is generally offered separately from other CPE, but NCTE functions may also be built into terminal equipment.³³ Under current rules, NCTE is treated as unregulated CPE³⁴ and may not be provided by a BOC as part of its regulated network, with a narrow exception for certain multiplexing functions that include on-premises multiplexers facilitating "provision of tariffed basic service offerings of (a) two or more communications channels for a single customer, or (b) individual channels to two or more customers."³⁵ Other NCTE-like functions may be provided by carriers as part of their regulated network offering, only if necessary equipment is on the network side of the customer's demarcation point.³⁶ The Commission will, however, grant waivers of its NCTE rules on a case-by-case basis based on a public interest finding that unregulated CPE will not permit "comparable efficiencies."³⁷

At this point, it is unclear how fiber optic networks fit into the Commission's NCTE rules. Several functions must be performed when fiber is used for transmission all the way to the customer's premises. First, optical signals must be converted to electrical signals. Second, multiple signals must be multiplexed (or demultiplexed). And third, as long as CPE such as television receivers are analog, digital signals must be converted to analog signals. These steps are necessary whether the fiber network is used for narrowband ISDN or transmission of integrated broadband services.

Although the FCC has stated that "carriers may provide versions of SLCs [subscriber loop carriers] that are designed to be used with fiber optic loop plant on customers [sic] premises as part of regulated equipment,"³⁸ the Commission has not yet comprehensively addressed how fiber optic networks and the equipment necessary to perform essential interface functions³⁹ fit into its Part 68 Rules, including those governing NCTE.⁴⁰ Questions that will have to be answered include: can such equipment be competitively supplied? Does it make sense to require users — especially residential consumers — to provide their own interface equipment? Should the necessary interface devices be treated as NCTE or be exempt from NCTE restrictions because they do not perform "traditional" NCTE functions? Should these devices be treated as multiplexers? Should carriers be permitted to supply such equipment as part of basic service if it is on customer premises but on the network side of the demarcation? Although the Commission has said it will entertain waiver requests on a case-by-case basis from carriers wanting to provide equipment which performs NCTE-type functions on a regulated basis and on customer premises,⁴¹ it will eventually have to answer these questions in a comprehensive way if fiber is to replace copper to any extent.

Powering Fiber Systems

A further question related to terminal equipment is who should be responsible for providing power for a fiber optic system? While today's telephone network provides electrical power sufficient to drive most single-line telephones, including ringing the ringer, a fiber optic system carries no electrical power with it. Therefore, as is true with PBXs and key systems, fiber optic terminal equipment, including the customer's interface unit, will require separate power. This is true whether the fiber system is used for broadband services or only for narrowband telephony. Because of the power requirements and the public safety implications (the need to prevent interruption of telephone service), most plans for fiber deployment include back-up batteries that will permit customers to use their telephones for up to eight hours.⁴²

5. Appropriate Safeguards Against Anticompetitive Behavior

An important question for policy makers and regulators as LECs develop and deploy IBNs is whether, and what kinds of, regulatory safeguards are necessary and appropriate to enable technological development while preventing anticompetitive behavior by the carriers. Should LECs develop broadband networks solely on a common carrier basis or should telephone/cable television restrictions be modified and carriers provide video programming within their telephone service areas?⁴³ In either instance, the regulatory concern is how to minimize the possibility of unwarranted cross-subsidies and discrimination against some customers — the content/information service providers. While the questions are the same in either case, the remedies may differ depending upon whether the carrier is also a content/information provider.

As long as a LEC has substantial market power, whether or not it is a content/information provider, it should be required to offer broadband transport on its IBN on a common carrier basis under Section 202(a) of the Communications Act which prohibits "any unjust or unreasonable discrimination" among users.⁴⁴ In the case where the local carrier is not in the content business and merely provides transport under tariff in the integrated broadband environment, it should not be permitted to have exclusive arrangements with any content provider such as a franchised cable operator. Unlike today's channel service, which is analogous to a tariffed special construction agreement, once a carrier offers broadband transport such as channel service on an integrated network to any content/information provider, the carrier should be required to provide that service to all legally qualified customers⁴⁵ on a nondiscriminatory basis.

Where the LEC is also a content/information provider (assuming that the telephone/cable cross-ownership rules and MFJ restrictions are relaxed), the question of preventing the carrier from discriminating in favor of its own unregulated content/information activities becomes more complicated. These questions are not new: the Commission has in place a set of safeguards designed to prevent cross-subsidies and discrimination

where carriers are involved in both regulated and unregulated activities. The Commission's *Joint Cost Order*⁴⁶ established procedures to prevent carriers from shifting costs of unregulated activities to ratepayers of regulated services that could result in cross-subsidization, misallocation of joint and common costs, and improper intra-corporate transfer pricing.⁴⁷ In addition, the Commission and many states are considering alternatives to traditional rate-of-return regulation that would reduce incentives and the ability of carriers to shift costs from unregulated to regulated activities.⁴⁸

In the context of its *Third Computer Inquiry*⁴⁹ (Computer III), the Commission created what might be an appropriate model for providing nondiscriminatory access for broadband content/information service providers. In that proceeding, the Commission required the Bell Operating Companies to submit Open Network Architecture (ONA) plans for providing enhanced service providers access to underlying "basic service elements" necessary to their operation.⁵⁰ In addition, if a BOC wants to offer an enhanced service before its ONA plan is approved, it can do so, but only after the Commission approves a service specific plan for Comparably Efficient Interconnection (CEI)⁵¹ by competing enhanced service providers.

Computer III safeguards may be only a model for ensuring non-discrimination where a carrier might provide video programming or other content based information over its own lines because: today, the BOCs are the only LECs subject to Computer III safeguards; and not all information provision services are enhanced services and thus might not be subject to the Computer III safeguards.⁵² To the extent that cable services or other content/information services take on characteristics of enhanced services, however, their offering by a BOC would be subject to Computer III safeguards. Until this occurs, the Commission and state regulators will have to establish appropriate mechanisms to ensure nondiscriminatory access to LEC networks for provision of competitive broadband content/information services.

Should LECs be permitted to enter the business of providing content by buying incumbent competitors (cable television operators)? If so, what safeguards are necessary to protect or foster competition in providing information/content such as video programming? If LEC entry into the information business is merely a matter of acquiring existing cable systems — as some in the telephone industry have indicated⁵³ — then competition would not be advanced. Unless exchange carrier entry into information/content provision is made conditional on the kinds of open-access safeguards discussed above, it will not necessarily promote the public interest.

One type of access not addressed by these safeguards is access to LEC poles and conduits (pole attachments). As long as there is a competing cable television industry that requires access to utility poles and conduits to reach its subscribers, discrimination is a potential problem especially if the utility also competes in delivering video programming. Although the Communications Act was amended to permit the FCC or the states to regulate pole attachment rates, terms, and conditions,⁵⁴ and the Commission has pole attachment regulations,⁵⁵ there is no federally guaranteed right of access to

utility poles and conduits. While there are some state laws guaranteeing access, this question needs to be addressed to ensure that LECs cannot, through control of poles and conduits, anticompetitively affect incumbent cable operators or stymie new competitors.

6. Common Carriers and the First Amendment

In addition to the questions surrounding the constitutionality of the cable television franchising process in an integrated broadband environment,⁵⁶ regulators and policy makers may have to address the question of what First Amendment rights, if any, a common carrier has when it is both a utility providing nondiscriminatory transport for others and, at the same time, a speaker. While this question has not been addressed directly by the Supreme Court⁵⁷ or by regulatory agencies,⁵⁸ it has been raised by the telephone industry in the Commission's Telephone/Cable Cross-ownership Inquiry.⁵⁹ If LECs are allowed into the business of providing content over their regulated common carrier facilities, will precedents from cable television cases limiting access requirements⁶⁰ extend to safeguards imposed on LEC broadband networks? Will such an interpretation foreclose LEC entry into content/information services because, once allowed, safeguards become unconstitutional? What are the implications, if any, of the Supreme Court's recent ruling invalidating a municipal ordinance regulating newspaper vending machines, holding that "even if the government may constitutionally impose content-neutral prohibitions on a particular manner of speech, it may not *condition* that speech on obtaining a license or permit from a government official in that official's boundless discretion."⁶¹

7. Audiotex Censorship by Telephone Companies

LECs have created an additional issue related to the First Amendment: censorship of non-LEC audiotex information services. Adult dial-it services, also known as "dial-a-porn," have become extremely controversial for carriers and regulators alike. The FCC has issued notices of apparent liability for \$600,000 each against two audio information services for transmitting obscene messages in violation of the Communications Act⁶² and one of those services signed an agreement with the Commission agreeing to pay \$50,000 and cease operations.⁶³ In addition, Congress has attempted to pass legislation banning all dial-a-porn calls and increased penalties for obscene commercial dial-a-porn⁶⁴ and the Commission has promulgated rules regulating indecent dial-a-porn⁶⁵ though those rules have been stayed pending court review.⁶⁶ A number of state commissions are looking into adult 976 dial-it services,⁶⁷ and several regional BOCs have either banned or otherwise regulated dial-a-porn services.⁶⁸ The criteria used by carriers in determining which audiotex services are "objectionable" can be very

subjective. For example, Michigan Bell has refused to bill customers for services that are: “inflammatory and likely to offend ethnic, gender, racial, or religious groups; lewd, lascivious, indecent, or obscene;...or likely to have a detrimental effect on Michigan Bell’s image or reputation.”⁶⁹ Does that mean that Michigan Bell could refuse to bill for a 976 audiotex consumer hotline that consistently complained about the telephone company’s rates and service?

Given that one of cable television’s attractions is the carriage of unedited adult movies that, while not obscene, have resulted in state censorship attempts, what confidence should a cable operator or other video programmer have that telephone companies will not censor broadband channel service just as they do 976 audiotex? If telephone companies permit only “non-objectionable” programming on their network will they be competitive with today’s cable systems — and even over-the-air broadcasters — in developing the kind of audience-targeted programming that broadband networks make possible? Have carriers too easily agreed to take over what should be the responsibility of government (i.e., enforcing obscenity laws)⁷⁰ and, therefore, put themselves in a position antithetical to becoming or serving First Amendment speakers? Carrier dial-a-porn actions may come back to haunt them in an integrated broadband environment.⁷¹

8. Copyright

If restrictions are relaxed and LECs are permitted to provide video programming, what will be their copyright liabilities? Will copyright regimes such as the cable compulsory license be extended to them?⁷² What about the copyright liability of those leasing channel service from a carrier or merely interconnecting with a carrier’s broadband switch? These and other copyright questions will have to be answered as traditional industry and institutional boundaries blur and erode with the deployment of IBNs.

9. Social Issues

IBN development will raise social policy questions. While not of the same nature as the regulatory and legal questions, social policy considerations will be prominent in arguments made to regulators. Some of these questions may work to slow broadband development while others may work to speed its eventual deployment. First, there will be those who oppose broadband networks for residential customers because “they don’t need them.” Why should residential telephone subscribers pay extra for something they already have or, alternatively, will not want in the future? There will be concerns that broadband deployment will benefit large users but residential ratepayers will end up paying for it through higher local rates.

If it is correct that fiber costs will drop below those of copper and LECs begin deploying fiber optic networks to residential customers within the near future for new

construction, and if successful new services are provided over these new networks that are not available to the rest of the community, then social policy concerns may shift to ensuring all residential customers benefit from the new technologies and services. If, however, no new services are developed, or those developed are not successful with consumers, then the pressure to equalize access to IBNs may not develop. Thus, successful IBNs and services for new, and often upscale communities, may create demands to redefine universal service beyond POTS in terms of new information services.⁷³ If this occurs, then the problem for LECs will shift from justifying investment for replacing existing plant to meeting regulators' demands for equity in network development.

Rebuilding the telephone network is viewed as affecting the nation's future and will be extremely expensive. The political debate surrounding IBN development cannot avoid social policy questions. The concern of public policy makers should be to minimize, as far as possible, the exploitation of social issues by competing industry interests to "game the process" to gain an advantage in regulatory and political arenas.

10. Conclusions

In the long term, IBN development will probably result in the fundamental restructuring of the domestic U.S. telecommunications and mass media industries. Institutional relationships and arrangements will be under pressure, historical alliances may change, and new regulatory structures will have to evolve. This is an unstable environment in which no existing player is guaranteed success. Under these conditions, the tendency is to protect the past, rather than look forward. If policy makers permit this backward view to prevail, a significant opportunity to advance our telecommunications infrastructure and industries may be lost.

Notes

This chapter is based upon R. Pepper, *Through the Looking Glass: Integrated Broadband Networks. Regulatory Policy and Institutional Change*, OPP Working Paper #24, Federal Communications Commission, 4 FCC Rcd 1306 (1988). (*Through the Looking Glass*, cites are to para.). The views expressed in this chapter and in the working paper are the author's alone and do not necessarily reflect those of the Federal Communications Commission or any of its Commissioners or staff.

1. Fiber optic technology is becoming the transmission medium of choice for trunking applications in the cable television industry. The policy and regulatory issues surrounding cable television network deployment of fiber and provision of telecommunications services (e.g., radio-based personal communications services) including barriers to providing such services are significant. While not the focus of this paper, those issues are as crucial to the development of

competitive local telecommunications services as are those confronting the local telephone exchange industry.

2. This paper is based upon a larger work that addresses those regulatory and institutional barriers. See, *Through the Looking Glass*, at 23 et seq.

3. The regulatory/legal world is ruled by definitions. Thus it is important that Congress defined a "cable system" as any facility providing "video programming directly to subscribers." 47 U.S.C. § 522 (6) (C) [(Cable Act of 1984 § 602 (6) (C)]. Both Commission rules and the Communications Act generally prohibit a local telephone company from operating or being affiliated with a cable system in its local telephone franchise area. This is commonly known as the telephone/cable cross-ownership prohibition. 47 CFR 63.54(a) codified in 47 U.S.C. § 533(b) (1984).

4. Local exchange carriers (LEC) are permitted by FCC rules and the Cable Act to construct and lease facilities to cable systems on a common carrier basis (known as "channel service"). Before a LEC may offer channel service it must file a Section 214 application with the FCC showing that the proposed service will serve the "public interest, convenience, and necessity." 47 U.S.C. 214(a). See also, *Through the Looking Glass*, at 37.

5. *General Telephone Company of California*, 13 FCC 2d 448, 454 (1968), *aff'd.*, *General Telephone Co. of California v. FCC*, 413 F.2d 390 (D.C. Cir.), *cert. denied*, 396 U.S. 888 (1969).

6. 47 U.S.C. § 152 (b).

7. 413 F.2d at 401 (quoting from *United States v. Southwestern Cable Co.*, 392 U.S. 157, 169 (1968)).

8. 413 F.2d at 401, n. 19.

9. See, e.g., *Wisconsin Bell, Inc.*, 4 FCC Rcd 2238 (Common Carrier Bur. 1989); *RVS Cablevision, Inc. v. Wisconsin Bell, Inc.*, File No. E-84-9 (Common Bur., released Aug. 30, 1984), *aff'd.* FCC No. 84-618 (released Dec. 13, 1984), *aff'd.*, *Paragon Cable Television, Inc. v. FCC*, 822 F.2d 152 (D.C. Cir. 1987).

10. "NARUC Communications Panel Also Authors Resolutions on ONA/CEI, ARCO Order Appeal, Cable/Telco Cross-ownership, Other Issues; Group Tables Praise for AT&T '900' Action," *Telecommunications Reports*, March 7, 1988, at 14. In passing Resolution No. 9, NARUC did not consider the jurisdictional separation implications in moving channel service regulation to the states. In addition to passing the telephone/cable cross-ownership resolution, the convention also passed Resolution No. 8 calling on Congress to modify the Cable Act of 1984 to permit cities and states to regulate local cable rates again.

11. Florida Public Service Commission Comments in response to Further Notice of Inquiry and Notice of Proposed Rulemaking in CC Docket No. 87-266, *Telephone Company/Cable Television Cross-ownership Rules. Sections 63.54-63.58*, 3 FCC Rcd 5849 (1988) (Telephone/Cable Crossownership). "The FPSC believes that loop facilities should be tariffed in the state jurisdiction and that revenues from all services, with the exception of traditional interstate toll and private lines, should accrue to the state jurisdiction."

12. Indeed, some have argued that even without complicating the situation with integrated broadband networks, today's methods are less than precise. For an excellent discussion of historical change in telecommunications costing and pricing practices, see, C. L. Weinhaus and A.G. Oettinger, *Behind the Telephone Debates*, (Norwood, NJ: Ablex Pub. Co., 1988); see also, A.G. Oettinger, *The Formula is Everything: Costing and Pricing in the Telecommunications Industry*, P-88-2, Program on Information Resources Policy, Harvard University, Cambridge, Ma., 1988. Oettinger concludes in part:

In the mid-1980s it had been more fashionable to seek a more direct tie between prices and costs than in the fashion of other times, more because of the rhetoric of some increasing competition than because of the realities of competition....Fairy tales abound for internal incentive, Internal Revenue, and other diverse purposes; in those realms, too, the formula is everything. *Id.*, at 51.

13. See, e.g., *Order and Certificate* for Southern Bell Telephone and Telegraph Company to provide channel service in Lake Mary, Fl., at 3. File No. W-P-C-5931, (released July 29, 1987).

14. 47 CFR 32.1 et seq.

15. Report and Order in CC Docket No. 86-111, FCC 86-564, 2 FCC Rcd 1298 (1987).

16. 47 CFR 36.1 et seq.

17. 47 CFR 69.1 et seq.

18. One concern about fiber deployment expressed by interexchange carriers (IXCs) is the extent to which such investment is increasing NTS costs that are recovered by carrier common line (CCL) charges — usage sensitive access charges levied on IXCs and paid by their customers in the form of higher long distance rates.

19. Indeed, in its Comments to the Commission in Telephone/Cable Cross-ownership, the Florida Public Service Commission (FPSC) asked the question of how to allocate costs between the interstate and intrastate jurisdictions:

A major issue...is one of the allocation of the costs of the fiber loop to be used for cable TV transmission. Historically, the local loop has been used for voice and data communications. The allocation procedures between the state and federal jurisdictions were based on an equitable division of costs between state and interstate voice and data communication. The introduction of fiber raises the issue of equitable cost recovery from a myriad of current and potential services provided over the facilities. *Id.*, at 3.

20. At 45 Mbps, a television transmission requires 703.125 times as much capacity as a 64 kbps telephone call ($45,000 \text{ kbps} / 64 \text{ kbps} = 703.125$). If priced on the basis of the marginal intra-LATA telephone cost of \$.01/minute, a minute of television transmission would cost \$7.03 ($$.01 \times 703.125 = \7.03) and a 120-minute movie would cost \$843.75 ($\$7.03 \times 120 = \843.75). Put another way: $(.01)(45,000/64)(120) = \843.75 .

21. Because a 45 Mbps television transmission uses 703.125 times the capacity of a 64 kbps telephone transmission, if the monthly flat rate for the television transmission is \$15.00 then, based on relative capacity, telephone service should be priced at \$.021/month ($\$15.00/703.125$).

22. "1990 Report on Television," A.C. Nielsen Co., Northbrook, Il., at 6.
23. $\$15.00/(45,000 \text{ kbps}/64 \text{ kbps})(7 \times 60 \text{ minutes}/23 \text{ minutes}) = \$.0012$.
24. Such a solution would result in a flat monthly rate of approximately \$40 a month for residential consumers and slightly more than that for business customers. J.L. Lande, "Telephone Rates Update," Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission, June 30, 1988; "NCTA study shows that post-dereg rates up average 6.7%," *Broadcasting*, November 30, 1987, at 86; and "Programmed for Growth, Why Cable TV Turns on Viewers and Investors," *Barrons*, March 28, 1988, at 9. For a discussion of pricing in an ISDN and broadband ISDN (B-ISDN) environment, see L. Anania and R.J. Solomon, "ISDN: User Arbitrage and the Flat Rate Solution," paper presented at the Seventh International Telecommunications Society meeting, Cambridge, Ma., July 1, 1988. Indeed, some analysts argue that telecommunications networks are becoming increasingly usage and distance insensitive; in a broadband environment they may also become bandwidth insensitive.
25. A.C. Nielsen, "1990 Report on Television," at 5.
- 26 For a discussion of how fast packet switches and digital compression technology might change the nature of this problem, see Anania and Solomon, *op. cit.*
27. The terms "CPE" and "terminal equipment" are used interchangeably to refer to equipment on the customer's premises ranging from "plain old telephones" to sophisticated private branch exchanges (PBX) that can perform switching and other functions.
28. In the Matter of the Carterfone Device in Message Toll Tel. Service, 13 FCC 2d 420, *aff'd.*, 14 FCC 2d 571 (1968). The earlier *Hush-A-Phone* decision prohibited restrictions on using non-electrical equipment with telephone company supplied CPE. *Hush-A-Phone v. United States*, 28 F. 2d 266 (D.C. Cir. 1956).
29. 47 CFR 68.1 et seq., Interstate and Foreign Message Toll Telephone, First Report and Order, 56 FCC 2d 593 (1975), *modified on recon.*, FCC 2d 716 (1976), *aff'd. sub nom. North Carolina Util. Commission v. FCC*, 552 F. 2d 1036 (4th Cir.), cert. denied, 434 U.S. 874 (1977).
30. Second Computer Inquiry, *Final Decision*, 77 FCC 2d 384, modified on recon., 84 FCC 2d 50 (1980), *further modified on recon.*, 88 FCC 2d 512 (1981), *att'd. sub nom. Computer and Communications Industry Ass'n. v. FCC*, 693 F. 2d 198 (D.D. Cir. 1982), *cert. denied*, 461 U.S. 938 (1983), *aff'd. on second further recon.*, FCC 84-190 (released May 4, 1984).
31. Procedures for Implementing the Detariffing of Customer Premises Equipment (Second Computer Inquiry), Report and Order, 95 FCC 2d 1276 (1983) (CPE Detariffing Order), *aff'd. on recon.*, 100 FCC 2d 1290 (1985).
32. See Furnishing of Customer Premises Equipment and Enhanced Services by American Telephone and Telegraph Co., *Order*, 102 FCC 2d 655 (1985) (*AT&T Structural Relief Order*); *modified on recon.*, FCC No. 86-341 (released August 7, 1986), (*AT&T Structural Relief Reconsideration Order*); and Furnishing of Customer Premises Equipment by the Bell Operating Telephone Companies and the Independent Telephone Companies, *Report and Order*, 2 FCC Rcd 143 (1987) (*BOC CPE Relief Order*), *modified on recon.*, 3 FCC Rcd 22 (1988), *aff'd. sub nom., Illinois Bell Telephone Co. v. FCC*, 883 F.2d. 104 (1989).

33. Amendment of Sections 64.702 of the Commission's Rules and Regulations, CC Docket No. 85-229, *Report and Order*, 104 FCC 2d 958, 1114, n. 378 (1986), (*Third Computer Inquiry*) *modified on recon.*, 2 FCC Rcd 3035 (1987), (*Phase I Recon Order*), *further recon.*, 3 FCC Rcd 1135 (1988), (*Phase I Further Recon. Order*), *second further recon.*, 4 FCC Rcd 5927 (1989), *vacated sub nom.* *California v. FCC*, 905 F.2d 1217 (9th Cir. 1990). The Commission reinstated the NCTE rules in Computer III Remand Proceedings, *Report and Order*, CC Docket 90-368, (Released December 17, 1990).
34. Amendment of Part 68 of the Commission's Rules, 94 FCC 2d 5 (1983), *recon. denied*, FCC 84-145 (released April 27, 1984) (*NCTE Decision*), Computer III Remand Proceeding, at para. 6.
35. Amendment of Sections 64.702 of the Commission's Rules and Regulations, CC Docket No. 85-229, *Phase II Report and Order*, 2 FCC Rcd 3072, 3105-06 (1987) *recon. denied*, 3 FCC Rcd 1150 (1988), (*Phase II Recon.*), *Phase II Order vacated sub nom.* *People of the State of California v. FCC*, 905 F.2d 1217 (1990), reinstated Computer III Remand Proceedings, CC Docket 90-368, (Released December 17, 1990). Computer III, Phase II rejected arguments that the multiplexer exception should be expanded. In its *LADT Order*, the Commission clarified the multiplexer exception by finding that devices such as data subscriber line carriers (DSLCL) located on customer premises that perform multiplexing as well as functions performed by NCTE and modems should be treated as unregulated CPE. *International Business Machines Corp., Memorandum Opinion and Order*, 58 Rad. Reg. 2d (P&F) 374 (1985).
36. Loopback testing may be provided by equipment on customers' premises as long as no functions of competitively supplied NCTE are affected, and the NCTE functionality provided to supply the loopback test may be used only for that purpose. *Third Computer Inquiry, Phase II Report and Order*, 2 FCC Rcd, at 3105 (para. 232).
37. *Id.* (para 234).
38. Computer III, *Phase II Recon.*, 3 FCC Rcd, at 1175, n. 242.
39. There are several names used for devices that perform electro-optical conversions including optical interface unit (OIU) and optical network interface (ONI).
40. The Commission denied as premature a petition from EDS asking to clarify that its Part 68 standards do not apply to digital services provided on non-metallic (fiber optic) circuits. 5 FCC Rcd 5578 (1990). *In Petition for Modification of Sec. 68.318(b) of the Commission's Rules (Report and Order)*, CC Docket 86-423, 2 FCC Rcd 6543 (1987), the Commission modified its Part 68 rules to eliminate the requirement that carriers provide line power on 1.544 Mbps (T-1) service.
41. Computer III, *Phase II Recon.*, 3 FCC Rcd, at 1167.
42. Another related question is who will supply the batteries? Will they be part of the network with the carrier responsible for provision, maintenance, and replacement? Or will batteries be considered CPE and be competitively supplied with customers responsible for periodically checking to see if they are still working and replacing them at the end of their five-year life? What happens when some premises are still served by a copper network in which local tariffs include the cost of electricity while other premises are served by a fiber network in which the customer

pays for all power? Will both customers pay the same rate even though the costs differ? (Electricity for POTS today has been estimated at about \$.35 per month depending upon how many incoming calls are received. The greatest demand on power is driving the ringer.) Will electricity be unbundled and supplied only where it is needed or wanted (for example, a customer who only calls out on a line)? The FCC has not yet formally addressed these questions and some of them probably are within state jurisdiction and will have to be addressed by state regulators.

43. In addition to the telephone/cable television cross-ownership prohibition, Bell Operating Companies (BOCs) are prohibited from providing information services (including content such as cable television service) under the terms of the Modification of Final Judgment (MFJ) that broke up AT&T. *United States v. AT&T*, 552 F. Supp. 131 (D.D.C. 1982), *aff'd. sub nom. Maryland v. United States*, 460 U.S. 1001 (1983). See also, *Through the Looking Glass*, at 32, for a discussion of BOC MFJ information service restrictions.

44. 47 U.S.C. § 202 (a) reads:

It shall be unlawful for any common carrier to make any unjust or unreasonable discrimination in charges, practices, classifications, regulations, facilities, or services for or in connection with like communication service, directly or indirectly, by any means or device, or to make or give any undue or unreasonable preference or advantage to any particular person, class of persons, or locality, or to subject any particular person, class of persons, or locality to any undue or unreasonable prejudice or disadvantage.

45. Until the local cable franchise requirement is changed by Congress or the courts, only locally franchised cable service will be legally qualified to lease channel service for delivering video programming directly to subscribers. See *supra*, at fn. 9, and *Through the Looking Glass*, at 39-45.

46. *Report and Order* in CC Docket 86-111, 2 FCC Rcd 1298 (*Joint Cost Order*), *recon.*, 2 FCC Rcd 6283 (1987), *further recon.*, 3 FCC Rcd 6701 (1988), *affirmed sub nom. Southwestern Bell Tel. Co. v. FCC*, 896 F.2d 1378 (D.C. Cir., 1990). See also, applicability of the Joint Cost Order to provision of channel service in *Further Notice* in Telephone/Cable Cross-ownership, at para. 51.

47. The problems associated with jurisdictional cost allocations discussed above are not nearly as great in identifying and directly assigning interstate costs to regulated and unregulated activities under the *Joint Cost Order* in today's environment where there is little interstate plant used jointly for regulated and unregulated activities. In a future integrated broadband environment, however, the difficulty of identifying and assigning regulated and unregulated costs is likely to increase. A mitigating factor may be that the *Joint Cost* rules will require carriers to design and deploy new facilities to facilitate cost assignment.

48. See, e.g., Policy and Rules Concerning Rates for Dominant Carriers, CC Docket No. 87-313, *Notice of Proposed Rulemaking*, 2 FCC Rcd 5208 (1987), *Further Notice of Proposed Rulemaking*, 3 FCC Rcd 3195 (1988), *Second Further Notice*, 4 FCC Rcd 2873 (1989), *Supplemental Notice of Proposed Rulemaking*, 5 FCC Rcd at 2176 (1990), *Second Report and Order*, 5 FCC Rcd 6786 (1990). For a discussion of why alternatives to rate-of-return regulation are necessary in today's increasingly competitive environment see, e.g., J.R. Haring and E. R. Kewerel,

"Competition Policy in the Post-Equal Access Market," OPP Working Paper #22, Office of Plans and Policy, Federal Communications Commission, February 1987; and FNPRM in CC Docket No. 87-313, 2 FCC Rcd at 3211-3271.

49. See *Supra*, at n. 34. The Commission reaffirmed its ONA requirements in Computer III Remand Proceeding.

50. *Phase I Report and Order*, 104 FCC 2d at 1059; *Phase I Recon.*, 2 FCC Rcd at 3035. For an overview of ONA requirements see generally, Filing and Review of Open Network Architecture Plans, CC Docket 88-2 Phase I, 4 FCC Rcd 1 (1988), *recon.*, 5 FCC Rcd 3084 (1990), *further order*, 5 FCC Rcd 3103 (1990), *recon. pending*, *appeals pending sub nom. California v. FCC*, No. 90-70336 (9th Cir., filed July 5, 1990), and *sub nom. MCI v. FCC*, No. 90-1332 (D.C. Cir., filed July 5, 1990). For a discussion of how Computer III safeguards might apply to telephone/cable cross-ownership, see *Further Notice* in Telephone/Cable Cross-ownership, at paras. 47-56.

51. *Phase I Report and Order*, 104 FCC 2d, at 1018.

52. Section 64.702 defines "enhanced service" as:

services, offered over common carrier transmission facilities used in interstate communications, which employ computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber's transmitted information; provide the subscriber additional, different or restructured information; or involve subscriber interaction with stored information.

47 CFR 64.702. While very similar, the MFJ defines "information service" as:

the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information which may be conveyed via telecommunications,...

§§ 552 F. Supp. at 229. In addition, the Court's March 7, 1988 Opinion refined that subset of information service, "electronic publishing," as a prohibited BOC activity:

...the provision by a Regional Company of any information which that Regional Company or its affiliates has, or has caused to be, originated, authored, compiled, collected, or edited, or in which it has a direct or indirect financial or proprietary interest, and which is disseminated to an unaffiliated person through telecommunications.

United States v. Western Elec. Co., Inc., Civil Action No. 82-0192, slip op., at 32, n. 39 (D.D.C., March 7, 1988). Therefore, while provision of traditional cable service as the one-way transmission of video programming comparable to broadcast television (47 U.S.C. §§ 522(5), (16)) is an electronic publishing information service under the MFJ, it probably is not an enhanced service under the Commission's Rules. Future cable services provided over switched IBNs, however, may entail "subscriber interaction with stored information" or may restructure information. If that is the case, those cable services would come under the definition of enhanced services and be subject to Computer III safeguards.

53. See, e.g., "Lee Cox: The industry's most-feared man tells why PacTel wants in cable," *Multichannel News*, August 15, 1988, at 46; J.R. Lopez and R. B. Smith, "Pacific Telesis Agrees to Buy Cable TV Stake," *Wall Street Journal*, April 21, 1989, at A3; and "PacBell Is Emphatic on Cable TV," *Communications Week*, May 29, 1989, at 10.
54. 47 U.S.C. § 224.
55. 47 CFR 1. 1401-1415.
56. It is difficult to see how cities may constitutionally license video programmers where they merely lease common carrier transport in an integrated broadband environment where the local exchange telecommunications network is built under existing state authority and there is no disruption to public safety or thoroughfares. See, *Through the Looking Glass*, at 41-43. The constitutionality of such a licensing requirement becomes even more suspect in a digital environment where it will become virtually impossible to distinguish among bit streams that are displayed as text, graphics, photographs, or moving images (i.e., video).
57. The AT&T trial court rejected BOC arguments that restrictions on information services violate their First Amendment rights. 673 F. Supp., at 586, n. 273.
58. For an initial discussion by the Commission see, *Further Notice* in Telephone/Cable Cross-ownership, at paras. 75-78.
59. See, e.g., USTA Comments in Telephone/Cable Cross-ownership, at 39-53.
60. See, *Through the Looking Glass*, at 41-42. A further question is how, if at all, cable television First Amendment protections would apply in cases where telephone companies acquire traditional cable systems?
61. *City of Lakewood v. Plain Dealer Publ. Co.*, 486 U.S. 750, 799 (1988) [emphasis supplied]. Similarly, the Court's decision in *Frisby v. Schultz* held that a municipal ban on picketing in front of a particular residence is content neutral and therefore constitutional, while an ordinance permitting only some messages would be content based and, therefore, unconstitutional. 487 U.S. 474, 499 (1988).
62. 47 U.S.C. § 223(b). *Notice of Apparent Liability*, Intercambio, Inc., File No. ENF-88-03, FCC 88-158 (released July 6, 1988); and *Notice of Apparent Liability*, Audio Enterprises, Inc., File No. ENF-88-04, FCC 88-159 (released July 6, 1988).
63. "Agreement Reached With Audio Enterprises to Enforce 'Dial-A-Porn' Law," FCC Press Release 426, November 7, 1988.
64. 47 U.S.C. § 223 (1990).
65. *Regulations Concerning Indecent Communications by Telephone*, FCC 90-230, 5 FCC Rcd 4926 (1990).
66. *Appeal pending*, Information Providers' Coalition for Defense of the First Amendment v. FCC, No. 90-70379 (9th Cir.).
67. See, e.g., "'976' Keeps States, Companies Busy; SW Bell Disconnects Live Lines After Court Victory," *Telecommunications Reports*, February 8, 1988, at 46; "States Still Busy with '976' Blocking; New York PSC to Probe Market Changes, Blocking," *Telecommunications*

Reports, February 15, 1988, at 11; "NARUC has released survey of 976 services," *Communications Daily*, February 26, 1988, at 7; "Information Services Subject to Restrictions, Criticisms in Alabama, Arizona, New York," *Telecommunications Reports*, July 4, 1988, at 21.

68. See, e.g., K. Killette, "Bell Atlantic Demands Limited Dial-Up Access," *Communications Week*, August 15, 1988, at 25; M. Fisher, "C&P Steps Up Attack on Party Lines," *Washington Post*, August 3, 1988, at B3; M. Fisher, "New Rules May Disconnect Area's 976 Calls," *Washington Post*, July 24, 1988, at A1; "Encouraged by Justice Letter to Pacific Telesis, US West Excluding 976 Sex Messages," *Telecommunications Reports*, May 30, 1988, at 35; J. Amparano, "US west to Ban 'Dial-a-Porn' Services on Its network; Other Bells May Follow," *Wall Street Journal*, May 31, 1988, at 2; "Phone Companies Take Steps Against Dial-a-Porn Services," *New York Times*, January 19, 1988, at A25.

69. "Michigan Bell Refuses to Bill for 'Objectionable' Services Under Ameritech Criteria," *Telecommunications Reports*, May 16, 1988, at 27. US West also has said that it "no longer will bill for any service that we believe could harm our reputation." See, A.M. Roussel, "Telcos Continue Quest for Answers to 976-Services Fray," *Communications Week*, February 29, 1988, at 25. And, Omnicall, an audiotex information service provider, has filed complaints with the Department of Justice against BellSouth and Bell Atlantic for policies against live 976 services including termination of service in Kentucky by South Central Bell which reportedly stated that it would "not provide billing and collection for live information services because of harm to its reputation." "Omnicall Writes Justice To Enlist Help Against BellSouth, Bell Atlantic '976' Limits on Live Service," *Telecommunications Reports*, August 29, 1988, at 14.

70. See, e.g., "Audiotext Standards Pose Complex Problems," *Communications Daily*, July 26, 1988, at 2-3; "Porn Providers Keep Pacific Bell In Court Over Disconnection, Charging 'State Action,'" *Telecommunications Reports*, July 11, 1988, at 21; "Judge Wants Proof of PUC Coercion in Cal. Dial-a-Porn Case," *Communications Daily*, July 7, 1988, at 4; "Dial-It Information Providers Cautioned on Increasing Content Rules," *Communications Daily*, June 3, 1988, at 3; M. Gartner, "Dial-a Porn Ban Is Obscene," *Wall Street Journal*, April 28, 1988, at 29.

71. See, e.g., "More cable-telco debate," *Broadcasting*, September 26, 1988, at 40. Washington communications attorney Philip Verveer noted that because local carriers are subject to rate regulation dependent upon the "goodwill" of public officials, they might "exercise extraordinary caution" carrying content that might be deemed "objectionable."

72. For a discussion of the compulsory license see, *Notice of Inquiry*, Compulsory Copyright License for Cable Retransmission, 2 FCC Rcd 2387 (1987). See also, Action in Docket Case: Repeal of Compulsory License for Distant Signals Recommended (Gen Docket 87- 25), FCC Press Release (October 27, 1988). For a more general discussion of cable copyright issues see, *Video Program Distribution and Cable Television: Current Policy Issues and Recommendations*, NTIA Report 88-223 (1988), at 108-124.

73. See, e.g., the recommendations of Pacific Telesis' Intelligent Network Task Force which was a broadly based group of Californians who looked at the telephone network of the future. The Task Force made twelve recommendations including redefining universal service to include access to a functionally rich "intelligent network." "The Intelligent Network Task Force Report," October, 1987, and Pacific Bell's Response to the Intelligent Network Task Force Report," Pacific Telesis, Sacramento, Ca., 1988.