2. *Adjacent-Channel Users*.

Both ends of the VHF and UHF bands are adjacent to frequencies allocated to non-broadcast users. In addition, the VHF band is interrupted by non-broadcast spectrum allocations inserted between Channels 4 and 5 and between Channels 6 and 7. In major markets, there are two non-broadcast channels in the Channels 14-20 band.

The authorized users of this adjacent-channel spectrum include amateur and citizens band radio users,[31/] mobile business[32/] and local governmental radio users,[33/] paging systems,[34/] and noncommercial FM radio stations and translators [35/] (the lower end of this FM band is adjacent to this upper end of television Channel 6).

The FCC has failed to set adequate interference standards or mileage-separation requirements to govern some of these adjacent-channel uses. Instead, the Commission has set standards on an ad hoc basis. For example, the Commission adopted cross-service interference-protection standards for

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31/ 47 C.F.R. § 2.106.

32/ 47 C.F.R. § 90.75.

33/ 47 C.F.R. § 90.17.

34/ 47 C.F.R. § 90.55.

35/ 47 C.F.R. § 73.501; 47 C.F.R. § 73.603.

non-commercial FM radio stations and Channel 6 television stations.[37/]

3. *Intermediate Frequency-Channel Users*.

To reduce circuitry and cost, all television receivers translate incoming broadcast signals to an intermediate frequency band between 41 and 47 MHz for internal processing and display. Transmissions by other users on this "intermediate frequency" or "IF" band can cause interference to television reception -- interference which by definition affects every television station in a market. In recent years, the FCC has allocated parts of the IF band to paging companies and mobile data transmitters that bounce radio signals off meteorite trails.[38/] In these "meteor burst" systems, communications are effected over great distances by bouncing radio signals off the ionized trails of meteors passing through the upper atmosphere. Each burst is very short because the meteors quickly burn up in the earth's atmosphere; but new meteors enter the earth's atmosphere at frequent intervals, such that they can be relied upon to provide acceptable service. This novel nontelevision use of the spectrum has the potential to interfere with the public's

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37/ *Memorandum Opinion and Order (Dkt. 20735), FCC 85-328 (released June 27, 1985).* See also *First Report and Order (MM Dkt. 86-144)*, 2 F.C.C. Rcd. 660, 661 ¶ 12 (1987).

38/ E.g., *Transtrack, Inc.*, 3 F.C.C. Rcd. 6833 (1988) (tracking of motor carriers).

television service. It exemplifies how advancing technologies are raising interference problems never envisioned by the Commission when it first formulated its policies on television interference.

D. *A Channel-By-Channel Catalog of Interference to Television Service from Nontelevision Sources.*

It should be clear that the existing framework of allocation, allotment, and assignment is only a general one for managing spectrum uses. It is a framework well suited to directing initial entitlements to use portions of the spectrum, but these policies have not always been able to anticipate new sources of interference from nontelevision uses, such as meteor burst systems. This is made clear when one shifts from discussing television interference generically and instead assesses on a channel-by-channel basis the severity of existing and proposed sources of interference.

1. *Interference to All Television Channels.*

As mentioned above, all television receivers, no matter the channel setting, modify the incoming signal to make it fall with in a band of intermediate frequencies extending from approximately 41 to 47 MHz. Therefore, any service authorized to transmit in that frequency band is a potential interferer. The signals from such transmitters, if sufficiently strong (and they often are), will pass through the TV receiver and appear as an annoying overlay of wavy lines or bursts of dashes on the picture or, perhaps, voices or noise superimposed on the program sound. Authorized radio

services in this frequency band include: local government,[39] police,[40] highway maintenance,[41] forestry conservation service,[42] special emergency,[43] forest products,[44] special industrial,[45] telephone maintenance,[46] motor carriers,[47] and meteor burst.[48]

2. *Interference to Channel 2.*

The primary interferer to Channel 2 is citizens band radio. The second harmonic of the authorized citizens band frequency falls into Channel 2. That second harmonic (two times the operating frequency) may be transmitted with sufficient strength to be received on-channel and cause interference; or a strong signal from a neighbor's CB or a passing vehicle can cause the second harmonic to be generated within a television receiver tuned to Channel 2.

39/ 47 C.F.R. § 90.17(b).

40/ 47 C.F.R. § 90.19(d).

41/ 47 C.F.R. § 90.23(b).

42/ 47 C.F.R. § 90.25(b).

43/ 47 C.F.R. § 90.53(b).

44/ 47 C.F.R. § 90.67(b).

45/ 47 C.F.R. § 90.73(c).

46/ 47 C.F.R. § 90.81(c).

47/ 47 C.F.R. § 90.89(b).

48/ *Revision and Update of Part 22 of the Public Mobile Radio Service Rules*, 95 F.C.C.2d 769 (1983); *Transtrack, Inc.*, 3 F.C.C. Rcd. 6833 (1988).

Another source of interference to Channel 2 is amateur radio. One of the amateur bands is directly below Channel 2.[49/] The situation can be likened to a narrow two-lane road. Two cars, each fully occupying its lane, may brush against each other while passing. The result can be disaster. So it can be with Channel 2. The receiver may not be able to squeeze itself into a sufficiently narrow band to avoid being brushed by a large amateur signal or, worse still, the amateur signal may not be confined entirely within its own "lane."

3. *Interference to Channels 2 through 6.*

Field disturbance sensors are permitted to operate within the same band of frequencies as Channels 2 through 6. These are security devices that emit a continuous signal creating an electromagnetic field around the area to be protected. The entrance of a person (or animal) into the field causes it to be modified in a way that can be detected and an alarm activated. However, the field may not be well confined, so nearby television receivers tuned to the same frequency as the field disturbance sensor can receive interference. The interference may appear as lines across the face of the picture tube, making the picture seem as if it is being watched through venetian blinds.

49/ 47 C.F.R. § 2.106; 47 C.F.R. § 73.603.

4. *Interference to Channels 4 and 5.*

A four megahertz gap (72 to 76 MHz) not assigned to television is found between Channels 4 and 5. The FCC has stuffed into that gap a number of low-power services having the potential to cause interference to either Channel 4 or 5 in a manner similar to that described previously for amateur band interference to Channel 2. Authorized radio services in the band include: forestry conservation service,[50] power,[51] petroleum,[52] forest products,[53] motion picture,[54] relay press,[55] special industrial,[56] business,[57] manufacturers,[58] telephone maintenance,[59] motor carrier,[60] railroad,[61] taxicab,[62] and automobile emergency.[63]

50/ 47 C.F.R. § 90.25(b).

51/ 47 C.F.R. § 90.63(c).

52/ 47 C.F.R. § 90.65(b).

53/ 47 C.F.R. § 90.67(b).

54/ 47 C.F.R. § 90.69(b).

55/ 47 C.F.R. § 90.71(b).

56/ 47 C.F.R. § 90.73(c).

57/ 47 C.F.R. § 90.75(b).

58/ 47 C.F.R. § 90.79(c).

59/ 47 C.F.R. § 90.81(c).

60/ 47 C.F.R. § 90.89(b).

61/ 47 C.F.R. § 90.91(b).

62/ 47 C.F.R. § 90.93(b).

(footnote cont'd)

5. *Interference to Channel 5.*

Citizens band radio constitutes a threat to Channel 5 as well as to Channel 2 because the third harmonic (three times the operating frequency) falls into the Channel 5 band (76 to 82 MHz). The mechanisms for and manifestations of interference are similar to those described for Channel 2.

6. *Interference to Channel 6.*

The primary source of interference to Channel 6 is noncommercial FM radio broadcasting -- regular stations and translators. Channel 6 is assigned the band from 82 to 88 MHz.[64/] Noncommercial FM is assigned the band from 88 to 92 MHz.[65/] Because the effective radiated power for the FM stations can be as high as 100 kilowatts, the potential for interference is great. The radio-frequency energy from the FM stations is not wholly contained within their assigned operating channels; and television receivers, when tuned to Channel 6, cannot totally eliminate signals above 88 MHz. Noncommercial FM interference appears as a moire pattern on the screen. The pattern changes with the FM sound.

Until a few years ago, the FCC had no rules relating to television interference from noncommercial FM. To resolve

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(footnote cont'd)

63/ 47 C.F.R. § 90.95(c).

64/ 47 C.F.R. § 73.603.

65/ 47 C.F.R. § 73.501.

the chaotic situation that required television stations to be constantly on the alert for potential interferers and to protest applications for FM facilities, proponents of the two services negotiated an agreement that the FCC incorporated into its rules.[66/] The compromise unfortunately allows limited but significant interference to Channel 6 service.

7. *Interference to Channel 7*.

Government land mobile service and the manufacturers radio service are both authorized to use the band just below Channel 7, which runs from 174 to 180 MHz.[67/] Another potential for interference has developed in the Commission's recent decision to authorize stolen vehicle recovery systems just below 174 MHz.[68/] In one such system, low-power transmitters are hidden in cars. If a car is stolen, a signal sent out from a higher power transmitter at a fixed location activates the automobile-mounted transmitter, which can then be tracked by specially equipped police vehicles. The low-power car transmitters constitute little threat to Channel 7 reception, but the base higher-power transmitters could cause interference to Channel 7 reception at nearby locations. Interference from the adjacent-channel authorized services is

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66/ 47 C.F.R. § 73.525.

67/ 47 C.F.R. § 73.601.

68/ *Amendment of Parts 2 and 90 of the Commission's Rules to Provide for Stolen Vehicle Recovery Systems*, 3 F.C.C. Rcd. 7195 (1988), aff'd, 4 F.C.C. Rcd. ___ (Sept. 29, 1989) [hereinafter *Stolen Vehicle Recovery Systems*].

likely to appear as bursts of wavy lines in the Channel 7 picture. This interference will add to the existing level of interference from current mobile operations.

8. *Interference to Channel 10 and 13*.

Channel 13 (210 to 216 MHz), being at the upper end of the VHF television spectrum, is affected by adjacent-channel land mobile radio services and the Automated Maritime Telecommunications Service (AMTS).[69] Land mobile radio services authorized to operate on a secondary basis in the frequency band from 216 to 220 MHz include: power,[70] special industrial,[71] business[72] and telephone maintenance.[73] The AMTS (which can affect Channel 10 as well as Channel 13, though not as severely) is currently authorized for use only on the Mississippi River, its tributaries, and along the Gulf of Mexico coast from the Florida panhandle westward. However, a petition is pending to permit use of AMTS in all navigable waters of the United States.[74] In addition, the same docket

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69/ See *Amendment of Part 81 of the Rules to Permit Public Coast Stations to Serve Vehicles on Land (AMTS)*, 1 F.C.C. Rcd. 1312 (1986).

70/ 47 C.F.R. § 90.65(b).

71/ 47 C.F.R. § 90.73(c).

72/ 47 C.F.R. § 90.75(b).

73/ 47 C.F.R. § 90.81(c).

74/ See *Amendment of Parts 2 and 80 of the Commission's Rules Applicable to Automated Maritime Telecommunications Systems (AMTS)*, 3 F.C.C. Rcd. 4736 (1988).

proposed to relax the technical sharing criteria between television and AMTS, which would aggravate interference to the public's service from Channels 10 and 13.

9. *Interference to Channels 15 and 16*.

UHF Channels 15 and 16 in the vicinity of the Gulf of Mexico can be affected by the use of those frequencies (476 to 488 MHz) for authorized base and mobile communications with offshore drilling platforms.[75/] This interference problem arises because of the anomalous over-water propagation characteristics at UHF and VHF. Such interference appears as intermittent wavy lines across the television picture.

10. *Interference to Channels 14 and 69*.

Land mobile operations are authorized just below Channel 14 (470 to 476 MHz), just above Channel 69 (800 to 806 MHz). The interference is principally of an adjacent-channel nature, appearing as intermittent wavy lines across the picture. Radio services authorized to operate either adjacent to Channels 14 and 69, or within Channels 14 through 20, include: local government,[76/] police,[77/] fire,[78/] highway

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75/ 47 C.F.R. § 90.315(a).

76/ 47 C.F.R. § 90.17(b).

77/ 47 C.F.R. § 90.19(d).

78/ 47 C.F.R. § 90.21(b).

maintenance,[79] forestry conservation service,[80] special emergency,[81] power,[82] petroleum,[83] forest products,[84] motion picture,[85] relay press,[86] special industrial,[87] business,[88] manufacturers,[89] telephone maintenance,[90] motor carrier,[91] railroad,[92] taxicab,[93] and automobile emergency.[94]

79/ 47 C.F.R. § 90.23(b).

80/ 47 C.F.R. § 90.25(b).

81/ 47 C.F.R. § 90.53(b).

82/ 47 C.F.R. § 90.63(c).

83/ 47 C.F.R. § 90.65(b).

84/ 47 C.F.R. § 90.67(b).

85/ 47 C.F.R. § 90.69(B).

86/ 47 C.F.R. § 90.71(b).

87/ 47 C.F.R. § 90.73(c).

88/ 47 C.F.R. § 90.75(b).

89/ 47 C.F.R. § 90.79(c).

90/ 47 C.F.R. § 90.81(c).

91/ 47 C.F.R. § 90.89(b).

92/ 47 C.F.R. § 90.91(b).

93/ 47 C.F.R. § 90.93(b).

94/ 47 C.F.R. § 90.95(c).

II. THE SIGNIFICANT, CUMULATIVE DEGRADATION OF TELEVISION SIGNALS THREATENS THE ECONOMIC VIABILITY OF THE NATIONWIDE SYSTEM OF FREE, LOCAL, AND UNIVERSAL OVER-THE-AIR TELEVISION SERVICE.

It is fallacious to assume that little harm comes from permitting an additional spectrum use that reduces the existing quality of television broadcast service incrementally. The cumulative effect of the numerous sources of television interference is to degrade significantly the quality of a valued public resource. How did it come about that the administration of the Commission scheme for regulating interference to television service has been so lax and ineffective?

In 1952, the television service was established based on the premise that the service area of a television station is limited because of interference. This was the origin of the principle of "interference-limited service." Under that principle, a station is allowed to degrade (interfere with) the service of another station operating on a channel that is the same as, or adjacent to, the channel on which the first station operates or is a channel with respect to which the "taboos" apply. In the 1950s, television-to-television interference was the only source of interference for which the FCC developed protection criteria. Issues such as aggregate interference, or interference from sources other than television signals, were briefly mentioned but not seriously investigated as potential sources of interference.

In 1956, the television industry formed the Television Allocations Study Organization ("TASO") to develop

technical quality standards for television.[95] The TASO work focused primarily on assessing picture quality in the presence of interference from another television station. Issues such as aggregate interference from multiple television signals or interference from nontelevision sources were ignored.[96]

Even today, the FCC does not have a definition of interference to television service other than from other television and educational FM stations. Since 1959, the FCC has evaluated the interference potential to the television service from new nontelevision services on an ad hoc, case-by-case basis. The FCC has used a number of different techniques throughout this period. The most common one, the "threshold method," is based on a set of technical subjective measurements to determine just-perceptible interference to a television picture. One shortcoming of this technique is that it does not account for aggregate interference.

To assess interference properly, the Commission must address both the cause and effect of interference. Stated differently, the Commission must address the sources of service degradation. The IEEE handbook contains a number of definitions for interference, the most appropriate one being: "Impairment to a useful signal produced by natural or man-made

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95/ *Engineering Aspects of Television Allocations: Report of the Television Allocations Study Organization to the Federal Communications Commission ("TASO Report")* (1959).

96/ *Id.* at 483.

sources." The handbook then elaborates: "Distortions caused by reflections, shielding, or extraneous power in a signal's frequency range are all examples of interference."[97/] This definition is a good starting point because it states (1) that interference is caused by a number of sources, and (2) that its effect is an impairment of service rather than a loss of service.

When the public interest problem is correctly characterized as being one of cumulative, mutiple-source interference rather than incremental interference from a single source, it becomes clear that the absence of a comprehensive policy to prevent nontelevision-to-television interference causes members of the public to suffer loss or impairment of service and undermines the economic viability of the nationwide system of free, local, and universal over-the-air television service. That system faces stiff competition from other delivery modes for video programming. MST's members do not expect or ask the Commission to shield them from fair competition. At the same time, it is necessary for the Commission to recognize in the context of cumulative nontelevision-to-television interference that the current nationwide system of free, local, and universal terrestrial television service is a unique, valuable, and endangered resource. The Commission acknowledged this point in September

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97/ IEEE Standard Dictionary of Electrical and Electronic Terms 456-57 (3d ed. 1984).

1988 in the context of advanced television (ATV): "Unlike many other countries, the United States has a strong and independent system of privately-owned and operated broadcast stations that transmit local and regional news, information, and entertainment as well as national and international programs."[98/] The value of that system is self-evident, for "broadcast stations provide services unique in the array of entertainment and non-entertainment programs freely available to the American public."[99/] "Therefore," the Commission concluded, "initiating an advanced television system within the existing framework of local broadcasting will uniquely benefit the public and may be necessary to preserve the benefits of the existing system."[100/]

It is laudable that the Commission recognizes that a nexus exists between ATV service and the long-run prospects of broadcasters to provide service that advances the public interest. However, that nexus is only one manifestation of a more fundamental relationship between the quality of television signals and the extent of consumer demand for over-the-air television as the preferred delivery mode for video programming. It would be erroneous to assume that the signal

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98/ *Advanced Television Systems and Their Impact on the Existing Television Broadcast Service*, 3 F.C.C. Rcd. 6520, 6525 ¶ 39 (1988).

99/ *Id.* (emphasis added).

100/ *Id.* (emphasis added).

quality of television service is continuing to improve and that the economic viability of television broadcasting is therefore secure. To the contrary, the public is experiencing a retrogression in the quality of television broadcast signals reminiscent of the electronic Tower of Babel that existed in 1926, when co-channel interference between radio stations was rampant because the absence of any meaningful regulation resulted in incorrect spacings.[101/] Unlike conditions facing radio in the 1920s, there are today many substitutes for over-the-air television service to which consumers may turn if the laxity of governmental regulation of interference permits the quality of television service to continue to deteriorate. Consequently, the long-term consumer demand for over-the-air television service is precarious.

If the nationwide system of free, local, and universal over-the-air television service is to survive, it is not enough for the Commission to contemplate how the advent of ATV someday will give television broadcasts the clarity of motion pictures. By that time, television broadcasting could be a moribund service. While the FCC praises ATV as a revolution in the future quality of video programming, it must not ignore that it is becoming increasingly difficult for broadcasters to protect the quality of their existing channels from interference. Over the number of years that will be necessary

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101/ *NBC*, 319 U.S. at 212.

to make ATV operational and ATV receivers affordable for over-the-air television service, and even thereafter, the economic health of television broadcasters will seriously deteriorate if the Commission does not act immediately to reverse its permissiveness toward new sources of nontelevision interference and to preserve the existing quality of television signals.

The causation is straightforward: If the Commission does not restore and defend the quality of broadcast television signals, television broadcasters will not be able to attract and retain viewers; as broadcasters can offer fewer viewers to advertisers, the demand for over-the-air advertising will fall; and as advertising revenues fall, the profitability of licensees will decline, as will their ability to secure quality programming. In short, the ability of television broadcasters to serve the public interest -- by providing programming that informs and enriches viewers as well as entertains them -- will atrophy if the Commission acquiesces to nontelevision spectrum uses that compromise the integrity of television broadcast service.

Television broadcasters are not being unduly pessimistic about the long-run consequences of nontelevision-to-television interference. The sheer number of proceedings involving such interference issues obscures their overall pattern and impact. Viewed independently, each proposal may not have universal or devastating interference consequences. But the cumulative effect of numerous proposals can be severe.

To comprehend the harm that the public will suffer from continued degradation of television broadcast signals because of new nontelevision uses of the spectrum, one need only consider how the listenership and profitability of AM radio fell as the quality of its broadcast signal deteriorated relative to FM and other audio media.[102/] When the Commission in April 1989 amended it rules to address the deterioration in the quality of AM broadcast service, Commissioner Dennis said candidly in a separate statement: "[T]his item is part of an overall review of our AM technical rules that could lead to major improvements in the technical quality of AM service. Individually, each of these items makes only incremental progress; collectively, they contribute to our long-term goal of reducing the interference that we at the FCC unfortunately helped to create."[103/]

Like the AM bands, the portion of the spectrum allocated to television broadcasting has become a dumping ground for electromagnetic pollution.

102/ *Amendment of the Commission's Rules to Improve the Quality of the AM Broadcast Service by Reducing Adjacent Channel Interference and by Eliminating Restrictions Pertaining to the Protected Daytime Contour*, 4 F.C.C. Rcd. 3835 (1989) [hereinafter *AM Broadcast Service*].

103/ *Id.* at 3842 (separate statement of Commissioner Dennis) (emphasis added).

III. RECENT COMMISSION DECISIONS DEMONSTRATE A FAILURE TO PREVENT SIGNIFICANT DETERIORATION OF THE QUALITY OF TELEVISION SERVICE AND REVEAL THAT THE COMMISSION CURRENTLY LACKS A COMPREHENSIVE AND CLEARLY ARTICULATED FRAMEWORK FOR MAKING DECISIONS THAT AFFECT THE AMBIENT LEVEL OF NONTELEVISION-TO-TELEVISION INTERFERENCE.

The perceived need to sandwich in new spectrum users and to permit more intensive "mining" of current allocations by existing users has placed great pressure on the Commission to dilute or relax current nontelevision-to-television interference-protection standards. In virtually all of these cases, the relaxation of interference standards is seen as essential to permitting the introduction of a new radio service or to permit expansion of a new service. This need is weighed against the incremental -- as opposed to cumulative -- degradation of the service provided by stations on one or more television channels.

Consequently, the Commission has permitted numerous spectrum uses that compromise the quality of television broadcast service by creating interference. The Commission has never clearly articulated the framework by which it purports to make decisions on matters affecting the ambient level of nontelevision-to-television interference imposed on existing television licensees.[104/] Instead, the Commission has approached these controversies on an ad hoc basis. In those

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104/ Even the Commission's current definition of interference understates the effects of interference, since by definition it is limited to areas that would lose service and does not encompass areas that would receive degraded service.

ad hoc decisions, several recurring (but fallacious) rationales appear to motivate the Commission's willingness to reduce interference protection standards for television broadcast service to the public.

In the discussion that follows, MST refers to various recent and current proceedings in which the Commission has relaxed or would relax interference protection standards for television broadcast service. These disparate proceedings have in common one or more of the following justifications or excuses for permitting the degradation of television broadcast service.

1. *Redefining Interference So That It Disappears*.

The Commission has redefined interference from non-television sources so that it appears to be less extensive or destructive than it really is. For example, in the recent UHF/land mobile sharing proceeding, the staff sought to define interference as that which occurs at levels 10 dB lower than those previously used.[105/] By this definitional change, what the FCC had previously defined as interference would no longer exist and lower standards could be proposed. Yet, the reality has not changed: the strength of the interfering signal and the impact on the public would be the same. Indeed, viewer testing showed that the public has become more sensitive to

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105/ *Further Sharing of the UHF Television Band by Private Land Mobile Radio Services, Memorandum Opinion and Order (Gen. Dkt. No. 85-172)*, FCC 85-290 (released July 10, 1985).

interference and that the current standards for protecting television service therefore are, in effect, less protective than when the Commission adopted them.[106/] Another example of such redefinition by the Commission is what would be the effective reduction of interference protection by the proposed reduction of IF spacings.[107/] In addition, the concept of negotiated interference can effectively redefine and erode existing interference criteria.

2. *Reliance on Consumer Complaints and "Market Forces" to Detect Interference.*

The Commission has presumed that interference to television service does not exist unless the FCC receives consumer complaints.[108/] This argument is linked to the Commission's reliance on "market forces," but its reasoning rests on unrealistic (and unstated) assumptions about perfect information and low transactions costs. Moreover, it simply

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106/ B. Jones, *Subjective Assessment of Protection Ratios for UHF Broadcast Signals*, Report 4/86, CBS Technology Center (Apr. 23, 1986).

107/ *Review of Technical Parameters for FM Allocating Rules of Part 73, Subpart B, FM Broadcast Stations*, (MM Dkt. 86-144), 3 F.C.C. Rcd. 1661 (1988).

108/ See, e.g., *Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License (First Report and Order)*, 4 F.C.C. Rcd. 3493 (1989); *Transtrack, Inc.*, 3 F.C.C. Rcd. 6833, 6835 ¶¶ 17-19 (1988); *FCC Regulations Concerning RF Lighting Devices*, 2 F.C.C. Rcd. 6775 (1987); *Stolen Vehicle Recovery Systems*, 3 F.C.C. Rcd. at 7196 ¶ 13.

cannot be reconciled with the Commission's duties under the Communications Act.

First, consumers do not have perfect (or often, any) information about technically complex problems of interference. If the air pollution control district in Los Angeles receives few consumer complaints about factories emitting sulfur dioxide, that fact hardly substantiates that Los Angeles is free of that pollutant -- or, more fundamentally, that consumers are unconcerned about the existence of such pollution. There is even less reason to expect that consumers will complain to the FCC about television interference, since viewers are unable to observe the source of electromagnetic pollution in the same way that they might be able to observe a smoking factory. The increasing increments of interference permitted may not even be noticed by the average viewer who ultimately, perhaps unconsciously, watches a particular station less and less or is driven to cable, videotapes, compact discs, and the like, by the cumulative degradation of over-the-air-service.[109/] To the extent that the consumer consciously perceives the interference, he may be unable to determine whether the interference is the result of receiver or station malfunction rather than the result of an alien signal.

109/ See generally NAB Study of Consumer Reactions to Signal Interference, submitted in Gen. Dkt. 87-389 (March 7, 1988).

Second, consumers lack perfect information about the Commission and its enforcement process. Few consumers know how to make a complaint. Moreover, the personal return to one individual of making a complaint is likely to be outweighed by the substantial cost and inconvenience to him of doing so, even though the aggregate harm to public is great.110/

Moreover, the Commission has not fully articulated how marketplace incentives are supposed to work in practice to prevent interference, let alone document that they do work in the specific case of nontelevision-to-television interference. As Chief Judge Wald has observed, the economic inferences that an agency draws will depend on the assumptions it makes, the methodology it uses, and perhaps also its ideological predisposition.111/ Here, the Commission's reliance on economic incentives to take care of television interference has been little more than an expression of faith. Without a more explicit and substantiated rationale for how market incentives can be expected to prevent broadcast interference from nontelevision sources, and without evidence that such incentives in fact are effective, the Commission cannot

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110/ This is a familiar problem of collective action. See, e.g., M. Olson, *The Logic of Collective Action* (1965). It is one reason why protection from interference must be secured by public rather than private enforcement of the Communications Act.

111/ Wald, *Limits on the Use of Economic Analysis in Judicial Decisionmaking*, 50 Law & Contemp. Probs. 225, 228-29 (Autumn 1987).

justify its actions by referring to "market forces" in a general way that ignores the problems that arise in the real world.

More fundamentally, the Commission cannot retreat from its statutory duty to protect the public from significant deterioration in the quality of television broadcast service due to interference from nontelevision sources. The public interest standard requires the FCC, and not consumers or other private parties such as licensees, to establish and police adequate interference standards.[112/] Congress plainly understood this point in 1934 and gave the FCC the responsibility of defining and limiting interference. The Commission cannot lawfully shirk that responsibility.

3. *Secondary Status*.

The Commission has relied on the concept of secondary status for new services as a justification for reducing interference standards. Low-power radio is proposed despite its potential for creating interference, with the rationalization that any facility causing interference would be required to terminate operations.[114/] But this reasoning ignores the Commission's previous findings that it is highly desirable to avoid having to shut down an operating station

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112/ 47 U.S.C. §§ 302, 303(f).

114/ E.g., *Report and Order*, MM Dkt. No. 86-112, 3 F.C.C. Rcd. 2196 (1988); *Transtrack*, 3 F.C.C. Rcd. at 6835 ¶ 19 (meteor burst system).

and withdraw existing service from the public.[115/] It also assumes (wrongly, for the reasons described on pages 39-40 above) that the interference will be brought to the Commission's attention.

4. *Technological or Methodological Advances*.

The Commission has shown a predilection to reduce the public's protection from nontelevision-to-television interference based on purported technological or methodological advances that do not justify such confidence. Premature or unwarranted reliance on new technologies and methodologies for controlling interference from nontelevision sources has the overall effect of permitting increased interference of that nature. By and large, the Commission has followed this reasoning in proceedings affecting services other than television broadcasting. But the Commission could extend that reasoning to television when the situation arises.

In the IF Spacing Docket, the Commission proposes to relax a significant protection against FM reception degradation for what appears to be a wholly theoretical reason -- namely, to achieve a uniform level of protection.[116/] The Commission's own finding of fact is that the proposed IF

115/ E.g., *RKO General, Inc.*, 89 F.C.C.2d 361, 365-67 ¶¶ 13-15 (1982).

116/ *Review of Technical Parameters for FM Allocation Rules of Part 73, Subpart B, FM Broadcast Stations (MM Dkt. No. 86-144)*, 3 F.C.C. Rcd. 1661 (1988).