BEFORE THE

FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON 25, D. C.

In the Matter of AMENDMENT OF SECTIONS 3.66, 3.274, AND 3.572 OF THE COMMISSION'S RULES AND REGULATIONS RELATING TO REMOTE CONTROL OPERATION OF CERTAIN STANDARD, FM, AND NON-COMMERCIAL EDUCATIONAL FM BROADCAST STATIONS	Docket No. 11677

REPORT AND ORDER

(Adopted: September 19, 1957)

BY THE COMMISSION: COMMISSIONERS MACK and FORD abstaining from voting

1. The Commission has before it for consideration its notice of proposed rulemaking released April 12, 1956 (FCC 56–323), and published in the Federal Register on April 18, 1956 (21 F. R. 2534), in response to a petition filed by the National Association of Radio and Television Broadcasters (NARTB) proposing amendments of the Commission's rules to authorize the remote control operation of all standard and FM broadcast stations.

2. Present regulations permit remote operation, subject to certain conditions, only by standard nondirectional and FM broadcast stations operating with powers not in excess of 10 kw. In our report and order adopting the present rules we recognized that the most important consideration was whether remote control operation would result in any degradation of the Commission's technical standards and concluded that, in light of the status of the equipment needed for remote control operation, the experimental demonstration of the feasibility of such operations, the conditions imposed upon remote control operation, and the salutary purposes to be accomplished by its use in appropriate situations, the authorization of remote control, if limited to standard nondirectional and FM stations, operating with power of 10 kw. or less, would not result in any degradation of our technical standards.

3. Approximately 500 comments on the proposal were received from various individuals and operators, broadcast stations, regional associations of broadcasters, the national networks, and several national labor unions. All of the comments submitted have been carefully evaluated and considered. However, in view of the large number of comments filed and the duplication of the contentions of the various parties, we shall limit our discussion thereof to the contentions ad-

vanced by the principal advocates and opponents of the proposal.

4. In support of the amendments, the NARTB urges that the Commission considered and disposed of all objections to remote control operations in adopting the present rules; that the Commission's conclusions are equally applicable to the association's present proposal; and that the only issue to be decided is whether a further relaxation of the rules would result in a degradation of the Commission's technical standards. NARTB claims that the limitations in the present rules were adopted solely because of the lack of technical proof that equipment of a higher power could operate without a degradation of the technical standards and urges that the data furnished with its petition demonstrates that present remote control operations indicate a high degree of reliability and that remote control operation may be extended to stations utilizing directional antenna systems and high power with the assurance that equal reliability will be achieved. The association alleges that the outage time of 198 stations now authorized for remote control operations amounted to only 0.04 percent of a total on-air figure of 630,790.5 hours, less than one-third the amount for stations operating without remote control prior to 1953; that this figure confirms the Commission's original conclusion that remote control operations would not result in excess outages and demonstrates that transmitting equipment and remote control equipment have reached a high state of development. It urges that remote operation of stations, utilizing directional antenna systems and operating with powers up to 50 kw., is feasible; that this opinion is confirmed by the data obtained from experimental remote operation of American, British, and Canadian stations and unattended operation of radio range stations.

5. The association recognizes the possibility that its proposals for relaxing the rules might affect the CONELRAD stations not now authorized for remote control, and proposes, that in order to insure the continued effectiveness of CONELRAD, any future remote control authorizations to a standard broadcast station, be conditioned upon the station's being equipped to operate in the system either by remote switching of the transmitter or, by using a separate transmitter. While the proposed rule would require the installation of certain equipment actual participation in the CONELRAD system would remain on a voluntary basis.

6. In opposition the American Communications Association (ACA), the International Brotherhood of Electrical Workers (IBEW) and the National Association of Broadcast Employers and Technicians (NABET) argue that the data submitted with the NARTB petition does not support the conclusion that the successful remote operation of stations utilizing directional antenna systems and higher power is feasible. ACA contends that the unattended operation of CAA low and medium frequency radio wave stations is not evidence of the reliability of transmitting equipment since the statistics furnished by NARTB indicate that during the 3-month period in 1955 the average outage per station per month was 3.28 hours. IBEW contends that the CAA operations are in no way comparable with broadcast operations nor has there been a showing of a clear and con-

vincing record of stability; that the range stations operate with less than 400 w.; that from July 1954 through June 1955, the CAA operated an average of 309.6 facilities for a total of 2,712,096 hours, with a total number of outage hours of 9,420, an average of 30.42 hours per station; that from January through December of 1955, 32 broadcast stations (19 of which have a power of 50 kw.) operated for a total of 254,931.2 hours with only 25.4 outage hours, an average of slightly more than 47 minutes per station and that in the CAA operation more time was lost due to transmitter trouble than was lost due to remote control failure. NABET contends that there is no evidence of the conditions under which such stations operate, the special reasons for unattended operation, and the special compensations made to maintain reliability. ACA argues that the contention of NARTB, that the unattended operation of stations by the British Broadcasting Corp. indicate the high degree of reliability of both broadcast transmitters and associated remote control equipment, is misleading in that many of the stations were semiattended and thus there are some serious questions as to the accuracy of the figures. NABET contends that the British experience with unattended operation does not show the direct relevance of this experience to the totally dissimilar American operation; that conditions are different in England than in the United States, in that what is satisfactory service in England, where the audience is small, would not be acceptable to the great urban audiences in this country and that the British use multiple unit transmitters to assure reliability. It is alleged that CONELRAD has become ineffective for those stations currently on remote control because of the time factor, that studio technicians are completely occupied with innumerable program operations and to expect them to perform additional full-time duties of keeping transmitter logs and to maintain the high standards of broadcast transmitter operation is unrealistic; that the reason for regular readings on transmitters is to anticipate abnormalities in operation and to take immediate action to correct such occurrences, and that the inevitable logic of remote control is to dispense with these readings completely.

7. Opponents contend that the issues in this proceeding are not confined to the purely technical question of whether a further relaxing of the rules would result in degradation of the standards and that unless the petition is dismissed on the basis of comments alone, the Commission must conduct full public hearings to obtain evidence on the operation of station transmitters from all persons concerned with their day-to-day operation, and to have the benefit of experienced judgments of independent engineers who are not partisan and dependent on the industry's good will and, if after full public hearings, it appears that there may be substance to the industries' demand for rules relaxation, then the Commission must conduct investigations into all phases of the status of present equipment, including direct studies and surveys by independent technical professional personnel of the hazards of unattended operation, the experience of all stations presently authorized to operate by remote control, and the number and cause of outages.

8. IBEW argues that exhibit 1 of the petition purports merely to explain the contents and significance of other exhibits and thus cannot be considered evidence in support of the petition; that exhibit 2 purports to show reliability of remote control operations with power not exceeding 10 kw. and nondirectional antennae and has no bearing on the present petition since the reliability of low-power, nondirectional operation was the subject of the 1952–53 proceedings.

9. With respect to the material in the petition with regard to stations with power in excess of 10 kw. and directional antenna IBEW contends that in the case of WIRO, the exhibit reveals the unreliability of remote operation as it describes the problems of obtaining suitable control circuits; that, although the period of remote operation covered approximately 79 days, readings were given for only 8 days, and during these 8 days the common point readings at the remote point exceeded the 2 percent tolerance which indicate the complete unreliability of the system as a whole; that in the case of WOWO the transmitter was operated by remote control from within the building using an artificial line to simulate each connection line and that readings made during the 571 hours of operation show that for 114 of these hours the readings were outside the 2 percent tolerance. It alleges that with respect to the material relating to stations with power in excess of 10 kw. and nondirectional antenna, the experimental operation at KDKA and WSB were attended operations and thus the material is not sufficient to permit any inference with respect to the technical feasibility of unattended operations; that in the case of KDKA the remote meters were in accord only for a small portion of the hours shown and a substantial number of readings fell outside the 2 percent tolerance; that there was no indication as to the number of outages that may have occurred and their nature and duration and that in the case of WSB a substantial number of readings were beyond the 2 percent tolerance, the operator on duty at the transmitter performed duties that would be done by remote control such as turning the transmitter on and off, taking frequency readings, resetting overloaded relays, etc.

10. IBEW states that in the case of the stations with power of 10 kw. or less with directional antenna referred to in the petition a first-class operator was present at the transmitters and maintained the operating log and kept the transmitter under supervision at all times, and therefore the experiments were not conducted on the same terms as the relaxation proposed and thus cannot be evidence as to the technical feasibility thereof; that with respect to the operation of certain Canadian stations the power of the stations was 10 kw. or less, there was no statement as to the accuracy of the telemetered readings; the claim of reliability of remote operation is difficult to evaluate because the telemetered information, recorded every 2 hours, is compared with actual readings, recorded only once a week, the telemetered reading of currents varied only slightly, while there were many excursions of the actual meter and that while the disparities were not large in all cases, their existence does reveal that the system is not to be relied upon.

11. NABET contends that the statistical survey of the experience of 198 telemetered stations submitted by NARTB is devoid of the

minimal controls required to assure reliability of such surveys, and is entirely devoid of discussion concerning the manner in which the survey was conducted and that the tabulation showing the average outage experience of 38 50 kw. stations is lacking details as to the number of outages, the causes of outages or even as to the number of hours of air-time operation. NABET notes that one of the grounds for the decision in docket 10214 which authorized remote control for stations with less than 10 kw. power and nondirectional antenna was the claim of NARTB that relaxation of the rules was necessary so that the small stations could survive in their competitive struggle with the larger stations and argues that the same small station's economic base will be undercut by granting their powerful competitors the same concessions. NABET states that the principal evidence offered by NARTB is a comparison of the loss of air time made between the NARTB's small-station survey and the average broadcast station, which indicated that, for 198 small nondirectional stations, the average outage time was 0.04 percent, while the corresponding figure for the average broadcast station in 1953 was 0.14 percent. They note that the proportion of reported outage time increases as the station power increases, and that the average outage for the 89 stations reporting outages was 0.09 percent.

12. With respect to the outage time of 50 kw. stations, NABET notes that the survey shows that under conditions of attended operation, large power stations are more reliable than small stations under remote control. They state that skilled transmitter operators on the spot can anticipate and prevent, or reduce to negligible quantities the number of outages and that the number of transmitter lapses is of infinitely greater importance than the loss of time with regard to the test data on directional stations. NABET alleges that the stations were not actually remote controlled, that the test was too brief, that the experiments were too small in number and that NARTB acknowledged several faulty results. They further note that in some instances the remote readings fell outside the 2 percent tolerance, and others show such exact correspondence that there is a reasonable question as to whether the readings were authentic.

13. With regard to CONELRAD, NABET states that CONELRAD is not the principal issue; that what NARTB offers in exchange for CONELRAD will not insure its success and that in fact, the added expense will cause many of the small stations to withdraw from CONELRAD. They suggest that CONELRAD participation either be made compulsory, without any industry attached conditions, or be taken over by the Federal Government.

14. One of the parties notes that the present rules do not appear to permit sampling loop meters with different scales than the base meters to be used as remote meters, although this is common practice; that the present practice is to mount the sampling loops above the base meters, whereas the rules require that remote meters be installed below the base meters and urges that section 3.39 (d) be modified to reflect current practice. Another party suggests that section 3.93 (b) be amended to permit lesser grade operators to be in control of directional antenna stations. It is also suggested that proposed section

3.66 (b) (1) be amended to permit the reading and logging of phase monitor sample currents in lieu of base currents provided base currents are ready and logged once weekly.

15. In its reply comments NARTB notes that the oppositions to the proposal are primarily directed to the adequacy of the technical showing. It maintains that many of these technical objections concern such matters as minor deviations in meter readings, and have no significance; other comments show a lack of knowledge of Commission procedures, or a misunderstanding of engineering matters; and the technical points that would have been significant, if valid, have been answered by supplemental exhibits filed with reply comments. NARTB asserts that these supplementary exhibits which contain additional data on existing remote controlled stations and experimental remote controlled stations using directional antenna and power in excess of 10 kw., establish that the reliability of remote equipment and transmitters is not changed because the equipment is used in connection with a directional antenna; that the CAA directional antennas achieve a reliability of 99.65 percent even though the standards for such antennas are stricter than those governing broadcast stations; that Canadian stations are successfully operating with remote control; that KDKA and WOWO have been successfully operated by remote control, and that the stations have experienced no serious malfunction of the transmitters during the experimental period. NARTB submits that with regard to station WSB recent data indicates that the transmitter, in its present condition, has not demonstrated sufficient reliability to justify remote control but contends that the transmitter could be modified so as to permit satisfactory remote control operation.

16. NARTB notes that the proposal to treat applications for remote control authorizations from stations with directional antenna systems on a case-to-case basis will eliminate any possibility of a station with a nonstable array receiving such an authorization, as each applicant will be required to make a showing of the stability of its array and, since it has been shown that directional antennas are stable and can operate by remote control, their use with higher power transmitters creates no additional problems and that the remaining issue is the reliability of transmitters with power in excess of 10 kw. It suggests that authorizations for remote control operation of stations, operating with power in excess of 10 kw., be granted on a case-to-case basis and only upon the following conditions:

(a) That an auxiliary transmitter, with power of 5 kw. or greater be installed which can be activated from the remote point; and

(b) That the station be required to make a reasonable showing of the reliability of the main transmitter.

It also suggests that in order to determine what transmitters are acceptable for remote control authorization, a yardstick should be adopted which would be rigid enough to exclude those stations whose equipment would be considered unreliable but flexible enough to include those stations whose equipment, by virtue of past maintenance practices, has shown a satisfactory performance record. To achieve this purpose NARTB suggests that the following information be submitted with the remote control application.

(a) An analysis of the transmitter logs for the 12-month period immediately prior to the application. This analysis to include such items as:
(1) Number of outages, cause, and duration.
(2) Consistency of specific outages and whether corrective measures can be or were taken to remedy further difficulties, and
(3) Effect of outages on program service.
(b) An analysis of the maintenance logs and records for the 12-month period immediately prior to the application. This analysis to include such items as:
(1) Type and consistency of maintenance performed; and
(2) Maintenance practices and policies adopted.

17. In reply to NABET's allegation that a grant of the instant proposal would destroy the basis of the 1953 decision—economic assistance to low-power stations—NARBA states that many stations which now utilize remote control only for their daytime nondirectional operation are subject to same economic difficulties as the nondirectional stations now authorized to operate with remote control both day and night and accordingly need this relief; that the major portion of the competition to the small station does not come from the larger station but from other competing media such as newspapers and television and therefore authorization of remote control operations for high-power stations will not materially affect the economic status of the low-power station, and that it is the larger stations that are now feeling the economic pinch.

18. In reply to the opponents contention that outages will materially increase if remote control of higher power transmitters is authorized, NARTB maintains that such authorization would tend to reduce the number of outages as broadcasters will have an incentive to modernize their equipment; that the existence of an auxiliary transmitter will eliminate the outages caused by malfunctions that cannot be immediately repaired by the attending first-class operator and that the broadcaster will be encouraged to increase preventive maintenance.

19. Other parties filing reply comments note that the objections to the proposed amendments were based upon contentions that instability in the transmitting equipment or directional antenna systems would result in loss of air time or in operation not in accordance with license specifications. They maintain that these contentions ignore the fact that stability of operation depends upon the quality of transmitting equipment and its installation and that the addition of remote control and metering equipment to any standard broadcast station cannot in itself make the installation more susceptible to failure or maladjustment.

20. IBEW filed a motion to strike the reply comments of the NARTB on the ground that they constitute an amendment to the petition and the submission of new evidence in an attempt to meet the deficiencies of the original presentation. The IBEW also states that inasmuch as the petition, considered with or without the reply comments, fails to make out a case, it must be dismissed and, in view of the fact that the reply comments contain a petition for totally different relief than that in the original petition, it would be improper and a denial of due process of law to proceed further with this case. NARTB filed an opposition to the motion to strike filed by IBEW. NARTB states that the reply comments are entirely proper and con-

tain only information that is relevant to the issues in this proceeding and rebuts the objections raised by the IBEW, NABET, and ACA, and that the change in the proposal for high-power stations is merely a suggestion of a different method by which the objective of this proceeding can be achieved. NARTB contends that the IBEW's interpretation of the scope of reply comments would deprive the Commission of basic information it needs in a rulemaking proceeding and that the sole limitation on such comments is that they must be relevant to the points raised in the comments. With regard to IBEW's contention that the acceptance of NARTB's reply comments would deprive it (IBEW) of due process of law, NARTB points out that this is a rulemaking proceeding and not a comparative hearing in which private rights only are concerned. We believe the material contained in the NARTB reply comments was proper rebuttal of the material contained in the original comments and relevant to the issues in this proceeding. Accordingly the motion to strike filed by IBEW is denied.

21. The IBEW filed a petition for institution of rulemaking to amend the remote control rules so that:

> Any station, irrespective of power, heretofore or hereafter authorized to operate by remote control may be so operated only if equipped so that it can be operated on the CONELRAD frequency assigned and the necessary switching from the stations assigned frequency to the CONELRAD frequency can be accomplished.

The NARTB petition proposed that all future remote control authorizations, whether or not now participating in the CONELRAD operating system, be conditioned upon the stations being equipped to satisfactorily operate in the system and, by remote switching of the transmitter or by using a separate transmitter, change from its normal frequency to a CONELRAD frequency. Therefore, we are treating the petition of IBEW as a counterproposal in this proceeding.

22. We have carefully considered the many comments filed in this proceeding, and on the basis of these comments and our own knowledge and experience in the field, obtained through reports and records, we have determined that standard and FM broadcast stations with powers in excess of 10 kw. and standard broadcast stations utilizing directional antenna should be authorized to operate by remote control under certain conditions. The most important consideration is whether such operation would result in any degradation of the Commission's technical standards and requirements, or more specifically, would increase the possibility of outages and improper transmitter operation. The record indicates that the present remote control operation of broadcast stations with powers up to 10 kw. has been satisfactory and no serious degradation of the technical standards has resulted from such operation. With respect to the effect of remote control equipment upon the operation of a directional antenna we find that the addition of such equipment in itself would not introduce any instability in such an array. While the addition of a directional antenna system would modify slightly the functions which are now performed by remote control it would not add any new type of function. The stability of a directional array is the function of the design of a passive network

designed to produce a predetermined pattern of radiation and has no relation to the means employed to monitor its operation. With respect to the effect of remote control upon the operation of transmitters with powers in excess of 10 kw., we find that the remote control equipment acting as it does merely to repeat back certain information, will repeat back this information without regard to the power of the transmitter. On the basis of the record and our experience we have concluded that the addition of remote control equipment itself has no effect upon the stability of a directional antenna or upon the transmitter itself.

23. A question remains as to the reliability of high-power transmitters themselves. The record indicates that some high-power transmitters in the experimental tests were run by remote control practically without loss of time and with only a few malfunctions. Two other transmitters were found to have insufficient reliability to justify unattended remote control operation in their present condition. However, it appears that these transmitters could be modified or certain other steps could be taken to correct the malfunctions. In this connection, we note that NARTB proposed that remote control operations of stations, operating with power in excess of 10 kw., be granted on a case-to-case basis and upon condition that the station install an auxiliary transmitter, and submit a reasonable showing as to the reliability of the main transmitter. We do not believe that the installation of an auxiliary transmitter should be a requirement for remote control authorization. We believe that station management realizes that broadcast time is important and that loss of on-air time results in loss of revenue and therefore they will seek methods to insure that remote controlled transmitters operate efficiently. However, we are of the opinion that a reasonable showing should be made of the past operation of the transmitter before remote control is authorized for a particular station. In order to demonstrate that a presently authorized transmitter, regardless of its power rating is reliable and capable of being operated by remote control, the following information should be submitted with the application (FCC Form 301–A):

(a) An analysis of the transmitter operating logs, maintenance logs and records for the 12-month period immediately prior to the application. This analysis is to include the following items:

(1) The number of outages, their cause and duration together with what corrective measures were taken to remedy the malfunction and to prevent such a recurrence.

(2) The nature and consistency of past maintenance performed and a statement as the maintenance practice and policy to be followed after remote control authorization.

24. We wish to point out that the instant proposal does not contemplate that stations with high power and/or directional antenna be operated by lesser grade operators. Many comments stressed the importance of preventive maintenance, the necessity for observation by an experienced technician, and the reliance on a first-class operator for any significant repair. We believe that it is important that qualified technicians be responsible for the operation of directional antennae and/or high-power transmitters even though such stations may operate by remote control. Therefore we are not changing the present rules which require that stations operating with directional antenna and/or

power in excess of 10 kw. have on duty either at the remote control point or transmitter location an operator holding a valid radiotelephone first-class operator license.

25. In response to the request contained in the notice of proposed rulemaking, many parties submitted comments concerning the information to be supplied with the application for remote control of directional antenna stations as well as to what data should be supplied after remote control was authorized. We have carefully reviewed the comments filed and have concluded that applications for remote control will be considered upon a case-by-case basis and granted upon a satisfactory showing that the directional antenna system is stable and is in proper adjustment. On the basis of the comments filed and our experience with the problems of directional antenna systems, we have determined that the basic information necessary to establish the stability and proper adjustment of a directional antenna system, and hence, the information which we will require as part of an application to operate a directional antenna by remote control is as follows: [1]

(a) A statement describing the stability of the system for the preceding one year period. This statement shall include, but shall not be limited to, such information as the nature and degree of adjustment required, the maintenance procedures followed and the adequacy of the present monitoring system to indicate changes in the operation of the array.

(b) Weekly readings of field intensity at each monitoring point specified in the station license for the preceding 1-year period. (Monthly readings will be acceptable for those stations which are presently authorized to measure monitoring points field intensities on a monthly basis.)

(c) Readings once each day of antenna base currents (for each pattern) and readings taken at approximately the same time of common point current, phase monitor loop sample currents or remote base currents, and phase indications for the preceding 30 days.

(d) A redetermination of the common point impedance of the directional antenna system.

(e) A partial proof-performance consisting of at least 9 or 10 measurements taken at a distance of from 2 to 10 miles from the antenna on each radial measured in connection with the last complete adjustment of the directional antenna system, properly analysed in accordance with section 3.186.

26. In its petition, NARTB proposed that a station authorized to operate with a directional antenna and/or with a power in excess of 10 kw. may operate by remote control only if equipped so that it can be operated on a CONELRAD frequency and the necessary switching from the station frequency to the CONELRAD frequency can be accomplished from the remote control position. We are of the opinion that the adoption of such a proposal would not necessarily be a departure from the concept that CONELRAD participation is on a voluntary basis. It should be noted that all stations whether or not operating by remote control must be so equipped so as to be able to follow the prescribed CONELRAD alerting procedure set forth in the CONELRAD Manual for Broadcast Stations. Therefore, CONELRAD operation is both mandatory and voluntary, i. e., participation of all broadcasting stations is mandatory to the extent that regular operation of the station must cease after the transmission of the required radio alert message, whereas stations may, upon a voluntary basis and after approval of the Commission, operate during a

[1] A revised Form 301–A will be provided in the near future.

CONELRAD alert to maintain contact with and disseminate information to the public. Such stations participate in the CONELRAD system and operate in accordance with the CONELRAD rules. Stations licensed to operate with higher power and/or directional antenna form the hard core of the CONELRAD system. We realize that in some cases a moderate expenditure might be required to enable these stations to continue in the CONELRAD system with remote control switching. While it is believed that no material number of stations would drop out of the plan because of the necessity of these expenditures, we feel that the public and national interest requires the continued success of the CONELRAD plan and the Emergency Broadcasting System. Therefore, we believe that we are justified in conditioning an authorization for remote control of a station operating with a directional antenna and/or a power in excess of 10 kw, upon the installation of equipment that would permit the changeover from the licensed operation to CONELRAD operation to be made from the remote control point. Accordingly, the request of NARTB is being adopted and therefore the counterproposal submitted by IBEW must be denied.

27. We realize that some existing stations are not required to make field intensity measurements at their monitoring points even though their licenses specify monitoring points at which the field intensity is not to exceed a specified value. Several parties commented that in such instances we should not make these stations take monitoring point readings for a year before authorizing their operation by remote control. We believe that the use of monitoring point readings is one method of determining if an array is stable. Furthermore, we do not see how a licensee could determine whether the field intensity at the monitoring points was exceeded unless measurements were taken at various intervals. We are therefore requiring stations to submit monitoring point readings for the year previous to their application for remote control.

28. Some directional antenna stations authorized prior to 1940 were not required to install phase monitors although some stations have installed phase monitors since that time. The remainder of such stations, if they desire to operate by remote control, must install a phase monitor in order to submit the required 30-day readings.

29. In order to insure that the operation, by remote control, of a station utilizing a directional antenna will not result in deviations from our technical rules or from the station license we have concluded that stations authorized to operate a directional antenna by remote control must: (a) make a proof of performance of the directional antenna system, consisting of from three to four measurements on each radial, once each year as part of the presently required equipment performance measurements and must submit the results of these measurements, plus the monitoring point readings, with each license renewal application, (b) read and log each half hour, at the remote control point, the common point current and the remote indications of base current for each tower of the directional system. (c) Read and log, at the transmitter location, once each day for each pattern (within 2 hours of operation with that pattern) common point cur-

rent, base currents, phase monitor loop sample currents, or remote base curents, and phase indications.

30. With further reference to the questions raised in its notice of proposed rulemaking, and in consideration of the comments received, we have determined that:

(a) No change is required in section 3.39 (h) with respect to automatic logging devices.

(b) Section 3.39 (d) (8) is being amended to permit the use of semiconductor devices in addition to vacuum tube rectifiers.

(c) Present rules which require the logging of antenna current and frequency are adequate to insure maintenance of power and frequency within the limits prescribed. It is deemed desirable, however, to amend the rules to provide that stations operating by remote control shall continuously monitor the percent of modulation or shall be equipped with an automatic device to limit the percent of modulation to 100.

(d) It is not necessary to require the installation of equipment to turn off the transmitter when it fails to function within the tolerances prescribed but the present remote control rules are being clarified to provide that defective operation of the remote-control equipment and associated line circuits resulting in improper control or inaccurate meter readings will require the immediate cessation of operation by remote control.

(e) Remote meters must be calibrated once each week as required by the present rules and the results thereof entered in the operating log. Meters installed at the remote control point to indicate antenna base current and common point current may utilize arbitrary scale divisions provided a calibration curve showing the relationship between the arbitrary scale and the scale of the base and common point meters is maintained at the remote control point.

31. Although we are not requiring that the tower currents as indicated by a phase monitor be read and logged at the remote control point, we do agree with the suggestion that the present rule with respect to the use of a phase monitor at the transmitter to determine the ratio of antenna currents should be revised to reflect current practice and are so amending section 3.39. We do not agree with the suggestion that a rule should be adopted which would permit the reading and logging of phase monitor sample currents in lieu of base currents provided base currents are read and logged once weekly. Section 3.39 (d) (1) (v) provides for the use of a phase monitor in obtaining remote indications of the tower currents but does not state how often the base currents must be read and logged. The station license in most cases specifies that the sample loop currents may be used provided base currents are read once a day. Upon a showing, this condition has been changed, on a case-by-case basis, to using base currents once a week. No evidence was submitted to convince us that our present practice in this regard should be changed.

32. Both the ACA and NABET urge that the Commission order an evidentiary hearing to determine the facts and also to conduct investigations to determine whether or not the malfunction of equipment has increased or decreased under remote control, whether or not CONELRAD is operating properly and that further consideration be given to doing away with the existing remote control authorizations. The Commission may in its discretion, grant the subject request for further proceedings if sufficient reason therefor be made to appear (section 405). We do not believe, however, that such sufficient reason has been demonstrated. All interested parties have

been afforded ample opportunity to file written comments and numerous comments have been received. It does not appear that an evidentiary hearing would serve any useful purpose nor would it be of material assistance to us. Accordingly, the requests for an evidentiary hearing are denied.

33. Authority for the adoption of the amendments herein is contained in sections 4 (i), 303 (b), (e), (g), and (r) of the Communications Act of 1934, as amended.

34. In view of the foregoing, *It is ordered*, That effective October 25, 1957, part 3 of the rules and regulations *Is amended* as set forth in the attached appendix.

APPENDIX

1. Section 3.39 is amended as follows:

A. That portion of paragraph (b) preceding subparagraph (1) is changed to read as follows:

(b) Instruments indicating antenna current, common point current, and base currents shall meet the following specifications:

B. Paragraph (c) is changed to read as follows:

(c) A thermocouple type ammeter meeting the requirements of paragraph (b) of this section shall be installed in the antenna circuit so as to indicate the antenna current. In the case of directional antennas the same type of ammeters shall be installed to indicate the common point current and the base current of each tower. (The ammeter may be so connected that it is short circuited or open circuited when not actually being read. If open circuited, a make-before-break switch must be employed.)

C. Paragraph (d) is changed to read as follows:

(d) Remote reading antenna ammeter(s) may be employed and the indications logged as the antenna current, or in the case of directional antenna, the common point current and base currents, in accordance with the following:

(1) Remote reading antenna, common point or base ammeters may be provided by:

(i) Inserting second thermocouple directly in the antenna circuit with remote leads to the indicating instrument.

(ii) Inductive coupling to thermocouple or other device for providing direct current to indicating instrument.

(iii) Capacity coupling to thermocouple or other device for providing direct current to indicating instrument.

(iv) Current transformer connected to second thermocouple or other device for providing direct current to indicating instrument.

(v) Using transmission line current meter at transmitter as remote reading ammeter. See subparagraph (7) of this paragraph.

(vi) Using indications of phase monitor for determining the antenna base currents or their ratio in the case of directional antennas, provided that the base current readings are read and logged in accordance with the provision of the station license, and provided further that the indicating instruments in the unit are connected directly in the current sampling circuits with no other shunt circuits of any nature. The meters in the phase monitor may utilize arbitrary scale divisions provided a calibration curve showing the relationship between the arbitrary scale and the scale of the base meters is maintained at the transmitter location.

(vii) Using indications of remote control equipment provided that the indicating instruments are capable of being connected directly into the antenna circuit at the same point as, but after, the antenna ammeter. The meter(s) in the remote control equipment may utilize an arbitrary scale division provided a calibration curve showing the relationship between the arbitrary scale and the scale of the antenna ammeter is maintained at the remote control point. The meter(s) in the remote control equipment must be calibrated once a week against the regular meter and the results thereof entered in the operating log.

(2) Remote ammeters shall be connected into the antenna circuit at the same point as, but after, the antenna ammeter(s), and shall be calibrated to indicate

within 2 percent of the regular meter over the entire range above one-third or one-fifth full scale. See paragraphs (b) (1) (i), (iii) and (b) (2) (i), (iii) of this section.

(3) The regular antenna ammeter, common point ammeter, or base current ammeters shall be above the coupling to the remote meters in the antenna circuit so they do not read the current to ground through the remote meter(s).

(4) All remote meters shall meet the same requirements as the regular antenna ammeter with respect to scale accuracy, etc.

(5) Calibration shall be checked against the regular meter at least once a week.

(6) All remote meters shall be provided with shielding or filters as necessary to prevent any feed-back from the antenna to the transmitter.

(7) In the case of shunt excited antennas, the transmission line current meter at the transmitter may be considered as the remote antenna ammeter provided the transmission line is terminated directly into the excitation circuit feed line, which shall employ series tuning only (no shunt circuits of any type shall be employed) and insofar as practicable, the type and scale of the transmission line meter should be the same as those of the excitation circuit feed line meter (meter in slant wire feed line or equivalent).

(8) Remote reading antenna ammeters employing vacuum tube rectifiers or semiconductor devices are acceptable, provided:

(i) The indicating instruments shall meet all the above requirements for linear scale instruments.

(ii) Data are submitted under oath showing the unit has an overall accuracy of at least 2 percent of the full scale reading.

(iii) The installation, calibration, and checking are in accordance with the requirements of this paragraph.

2. Section 3.56 is amended by adding the following new paragraph (d):

(d) Each station operated by remote control shall continuously, except when other readings are being taken, monitor percent of modulation or shall be equipped with an automatic device to limit percent of modulation on negative peaks to 100.

3. Add following sec. 3.65 a new undesignated center heading to read as follows:

REMOTE CONTROL

4. Delete § 3.66 and substitute the following:

§ 3.66 *Remote control authorization.* (a) Application to operate a station by remote control may be made as a part of the application for construction permit for a new station, provided that the proposal is for nondirectional operation with a power of 10 kw. or less.

(b) Application to operate an authorized station by remote control shall be made on FCC Form 301–A.

(c) An authorization for remote control will be issued only after a satisfactory showing has been made in regard to the following, among others:

(1) the location of the remote control point(s);

(2) the directional antenna system, if such is authorized, is in proper adjustment and is stable;

(3) the transmitter, if the power rating is in excess of 10 kw. is reliable and capable of being operated by remote control.

(4) the station, if authorized to operate with a directional antenna and/or with power in excess of 10 kw. will be equipped so that it can be satisfactorily operated, in accordance with subpart G of this part, on a CONELRAD frequency with a power of 5 kw. or not less than 50 percent of the maximum licensed power whichever is the lesser and that the necessary switching from the licensed frequency to the CONELRAD frequency can be accomplished from the remote control position.

5. Add the following new section 3.67 which is derived from old sec. 3.66:

SEC. 3.67 *Remote control operation.* (a) Operation by remote control shall be subject to the following conditions:

(1) The equipment at the operating and transmitting positions shall be so installed and protected that it is not accessible to or capable of operation by persons other than those duly authorized by the licensee.

(2) The control circuits from the operating position to the transmitter shall provide positive on and off control and shall be such that open circuits, short circuits, grounds or other line faults will not actuate the transmitter and any fault causing less of such control will automatically place the transmitter in an inoperative position.

(3) A malfunction of any part of the remote control equipment and associated line circuits resulting in improper control or inaccurate meter readings shall be cause for the immediate cessation of operation by remote control.

(4) Control and monitoring equipment shall be installed so as to allow the licensed operator at the remote control point to perform all the functions in a manner required by the Commission's rules.

(5) The indications at the remote control point of the antenna current meter or, for directional antennas, the common point current meter and remote base current meters shall be read and entered in the operating log each half hour.

(6) The indications at the transmitter, if a directional antenna station, of the common point current, base currents, phase monitor sample loop currents and phase indications shall be read and entered in the operating log once each day for each pattern. These readings must be made within 2 hours after the commencement of operation for each pattern.

(b) All stations, whether operating by remote control or direct control, shall be so equipped, in accordance with sec. 3.932, so as to be able to follow the prescribed CONELRAD alerting procedure set forth in the CONELRAD Manual for Broadcast Stations.

(c) A station, operating with a directional antenna and/or with power in excess of 10 kw. shall be so equipped that a shift from the licensed operation to an operation in the CONELRAD system can be accomplished from the remote control position.

6. Add the following new sec. 3.68:

SEC. 3.68 *Remote control renewal application.* (a) An application for renewal of a remote control authorization may be made on the application for renewal of station license.

(b) Stations employing directional antenna and operated by remote control shall make a skeleton proof of performance each year, consisting of three or four measurements on each radial used in the original application and must submit the results of these measurements, plus the monitoring point readings, with the renewal application.

7. Section 3.111 is amended by adding the following new subparagraph (5) to paragraph (b) and renumbering the present subparagraph (5) as subparagraph (6). As amended, subparagraphs (5) and (6) read as follows:

(5) Any other entries required by the instrument of authorization.

(6) Log of experimental operation during experimental period. (If regular operation is maintained during this period, the above logs shall be kept.)

(i) A log must be kept of all operation during the experimental period. If the entries required above are not applicable thereto, then the entires shall be made so as to describe the operation.

8. Delete sec. 3.274 and substitute the following:

SEC. 3.274 *Remote control authorization.* (a) Application to operate a station by remote control may be made as a part of the application for construction permit for a new station. Application to operate an authorized station shall be made on FCC Form 301–A.

(b) An authorization for remote control will be issued only after a satisfactory showing has been made in regard to the following, among others:

(1) The location of the remote control point(s);

(2) The transmitter, if the power rating is in excess of 10 kw., is reliable and capable of being operated by remote control.

9. Add the following new section which is derived from old sec. 3.274:

SEC. 3.275 *Remote control operation.* (a) Operation by remote control shall be subject to the following conditions:

(1) The equipment at the operating and transmitting positions shall be so installed and protected that it is not accessible to or capable of operation by persons other than those duly authorized by the licensee.

(2) The control circuits from the operating position to the transmitter shall provide positive on and off control and shall be such that open circuits, short

circuits, grounds or other line faults will not actuate the transmitter and any fault causing loss of such control will automatically place the transmitter in an inoperative position.

(3) A malfunction of any part of the remote control equipment and associated line circuits resulting in improper control or inaccurate meter readings shall be the cause for the immediate cessation of operation by remote control.

(4) Control and monitoring equipment shall be installed so as to allow the licensed operator at the remote control point to perform all the functions in a manner required by the Commission's rules.

(b) All stations, whether operating by remote control or direct control, shall be so equipped, in accordance with sec. 3.932, so as to be able to follow the prescribed CONELRAD alerting procedure set forth in the CONELRAD Manual for Broadcast Stations.

10. Delete sec. 3.572 and substitute the following:

SEC. 3.572 *Remote control authorization.* (a) Application to operate a station by remote control may be made as a part of the application for construction permit for a new station. Application to operate an authorized station shall be made on FCC Form 301–A.

(b) An authorization for remote control will be issued only after a satisfactory showing has been made in regard to the following, among others:

(1) The location of the remote control point(s);

(2) The transmitter, if the power rating is in excess of 10 kw., is reliable and capable of being operated by remote control.

11. Add the following new section which is derived from old sec. 3.572:

SEC. 3.573 *Remote control operation.* (a) Operation by remote control shall be subject to the following conditions:

(1) The equipment at the operating and transmitting positions shall be so installed and protected that it is not accessible to or capable of operation by persons other than those duly authorized by the licensee.

(2) The control circuits from the operating position to the transmitter shall provide positive on and off control and shall be such that open circuits, short circuits, grounds or other line faults will not actuate the transmitter and any fault causing loss of such control will automatically place the transmitter in an inoperative position.

(3) A malfunction of any part of the remote control equipment and associated line circuits resulting in improper control or inaccurate meter readings shall be cause for the immediate cessation of operation by remote control.

(4) Control and monitoring equipment shall be installed so as to allow the licensed operator at the remote control point to perform all the functions in a manner required by the Commission's rules.

(b) All stations, whether operating by remote control or direct control, shall be so equipped, in accordance with sec. 3.932, so as to be able to follow the prescribed CONELRAD alerting procedure set forth in the CONELRAD Manual for Broadcast Stations.

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