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POLICIES OF APARTHEID OF THE GOVERNMENT OF SOUTH AFRICA

Assessment of needs for technical assistance to radio stations  
that are broadcasting or willing to broadcast to South Africa

Report of the Secretary-General

I. INTRODUCTION

1. In its resolution 43/50 H, paragraph 1 (b), of 5 December 1988, the General Assembly urged the Secretary-General, inter alia, to:

"Provide all appropriate technical and financial assistance to radio stations of those Member States which are broadcasting or willing to broadcast to South Africa, in order to enable their radio transmitters to be heard inside South Africa;".

2. In document A/C.5/43/50/Add.1 the Secretary-General informed the Fifth Committee that, in order to estimate the possible financial implications of the requests contained in the relevant paragraphs of the above-mentioned resolution, the following factors would have to be determined:

(a) The extent of "technical" assistance that may be required by individual radio stations and the total number of such stations;

(b) The number of radio stations that may wish to benefit from possible "financial" assistance;

(c) The extent to which currently operating transmitters may need to be upgraded in order to be heard inside South Africa.

3. The Secretary-General suggested a phased approach for the implementation of the requests, beginning with a programming and technical study, involving the radio stations of interested Member States.

4. In paragraph 1 (c) of General Assembly resolution 43/50 H, the Secretary-General was also requested to "ensure regular monitoring and evaluation of the impact" of the anti-apartheid radio programmes produced by the Department of Public Information.

5. Thus, three separate but interrelated studies were envisaged in implementation of paragraphs 1 (b) and (c) of General Assembly resolution 43/50 H:

(a) A technical study to determine the extent of assistance that may be required by individual radio stations;

(b) A study of existing and potential interest in broadcasting United Nations anti-apartheid radio programmes;

(c) A study of the extent to which audiences in South Africa listen to United Nations anti-apartheid radio programmes, in response to the request in paragraph 1 (c) of Assembly resolution 43/50 H.

6. The first two studies have been completed. The technical study, referred to in paragraph 5 (a) above, was done by a consultant from the International Telecommunication Union (ITU). The Secretary-General wishes to express his most sincere gratitude to ITU for its co-operation. The second study, referred to in paragraph 5 (b) above, was done by a radio programming expert in the Department of Public Information.

7. Because of the interrelationship between the second and third studies, the Secretary-General proposes to submit their findings in a single report to the General Assembly at its forty-fifth session, through the Committee on Information at its substantive session in 1990.

8. The present report accordingly reflects the results of the technical study.

9. Operative paragraphs 1 (a), (d), (e) and (f) of General Assembly resolution 43/50 H have been responded to by the Secretary-General, as reflected in his statement on programme budget implications of the resolution, submitted in accordance to rule 153 of the rules of procedure of the General Assembly (A/C.5/43/50/Add.1).

## II. METHODOLOGY

10. The consultant of ITU and the programming expert of the Department of Public Information did the two studies at the same time (21 April to 16 June 1989) as a team, with missions to the following countries in southern Africa: Angola, Botswana, Lesotho, Mozambique, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe. The team met with various officials of the broadcasting organizations in each country. In some countries they also met with government officials responsible for information and broadcasting. In addition to the discussions with officials, questionnaires were completed in each country - one dealing with the technical aspects (see annex), and the other dealing with programmes. After

checking the responses to the questionnaires, further discussions were held to obtain clarifications, to complete omissions and to correct errors.

11. The questionnaire on technical aspects concentrated on collecting information on the existing and planned transmitting facilities in each country. From this information the ITU consultant was able to estimate the extent of coverage of South Africa from the existing installations in each country and to estimate all other equipment required for improved coverage. The team also visited the main transmitting stations in order to assess the operating condition of the existing equipment and the competence of the staff.

12. Subsequently, an effort was made at estimating the cost of needed improvements, as well as the annual operational costs involved. However, owing to the urgency for the completion of the report in the very limited time available, the costs given in this report are only rough estimates.

13. Only those countries that expressed total readiness to transmit United Nations anti-apartheid programmes - namely: Angola, United Republic of Tanzania, Zambia and Zimbabwe - were finally considered for recommendations on the minimum equipment which would provide a signal level deemed capable of reaching large audiences in South Africa.

14. The paragraphs below contain a summary of findings and recommendations relevant to each of the four countries mentioned above. These summaries (including conclusions and recommendations) are based entirely on the report of the ITU consultant.

### III. ANGOLA

15. Radio transmitters: Radio Nacional de Angola (RNA) has two 100 kW HF transmitters. These transmitters were installed in 1967 and have been operating ever since. The RNA is already experiencing some difficulties in obtaining spare parts, even though these problems are not yet serious.

16. Antennas: RNA has two dipole curtain arrays. Both antennas were erected at the same time as the transmitters, in 1967.

17. Studio to Transmitter Link (STL): RNA has reliability problems with its studio to transmitter radio links, owing to insufficient terrain clearance, old age and poor quality of the equipment. RNA would like engineering assistance for the design of a new path for the STL and financial assistance for the replacement of the present links.

18. Conclusions:

(a) The present HF transmitters at RNA are of very old technology and difficult to retune to alternative frequencies - a property which is considered essential for the objectives of the project. The age of the transmitters also indicates that soon RNA will experience serious problems in procuring spare parts - a sure sign of approaching the end of their useful service life;

(b) The only antenna that is suitable has very limited operating frequency range. For satisfactory transmission at different times of day and months of the year transmission may be necessary at frequencies that fall outside the range of this antenna. Furthermore, the age of the antenna combined with its proximity to the sea means that it most probably needs replacement;

(c) The STL is a small but vital part of the transmission chain. The RNA has stated that it encounters frequent reliability problems with its existing link and has recommended its replacement and improvement.

19. Recommendations: transmissions from Angola to South Africa will be significantly improved by the addition of the following equipment:

(\$US)

(a) One 100 kW HF transmitter of modern technology and capable of easy retuning to any frequency in the range 6-21 MHz. Estimated cost .....	1 500 000
(b) One set of dipole curtain antennas of type HR/2/2/0.5, covering the band 6-21 MHz. Estimated cost .....	500 000
(c) One set of duplicated STL programme links. Estimated cost .....	50 000
(d) Diesel engine/generator standby power supply. Estimated cost .....	100 000
(e) Equipment subtotal .....	<u>2 150 000</u>
(f) Freight, insurance and installation for items (a) (b) (c) and (d). Estimated cost .....	500 000
(g) One set of spare parts. Estimated cost .....	150 000
(h) Maintenance and training. Estimated cost .....	100 000
(i) Miscellaneous subtotal .....	<u>750 000</u>
(j) Building requirements. Estimated cost (local) .....	150 000
(k) Total capital cost estimate .....	<u>3 050 000</u>
(l) Annual operating costs (local) .....	250 000

## IV. UNITED REPUBLIC OF TANZANIA

20. Present situation at Radio Tanzania (RT): at present, RT does not operate an effective external service. The two 50 kW HF transmitters presently in operation on vertical incidence antennas are aimed at national coverage. RT has now taken delivery of two 100 kW HF transmitters whose installation is expected to be completed by January 1990. These transmitters will use the existing wide-band dipole curtain antennas after their refurbishing. The survey team was informed that the previous 50 kW transmitters had very good reception in practically all parts of South Africa and West Africa. They are confident that with the higher power of the new transmitters, they will be covering these areas very well.

21. The programmes from the studios to the transmitting site are carried by a PTT underground multicore cable, which has been reported to be unreliable. Officials at Radio Tanzania would like to see this replaced by a VHF link. The type of link they suggest is described in paragraph 23 below.

22. During the visit to the transmitting station, the survey team noted a need for staff training, particularly in management. This is an area where United Nations assistance may prove very beneficial.

23. Future plans at RT: the immediate plans are to install the new HF transmitters. The next priority is to replace the underground cable link, which owing to urbanization of the area, is subject to frequent interruptions. In 1992-1993 RT plans to acquire three more 100 kW HF transmitters for its national, external and commercial services. RT suggested that a link can be formed by installing a 100 W VHF/FM broadcast transmitter with an omnidirectional antenna at the Studio Centre and receivers at the HF transmitting station. This system will provide Dar es Salaam with a high quality sound programme and satisfy the STL requirements.

24. Conclusions: of all the countries visited, the United Republic of Tanzania will be the first to operate a reliable service specifically directed to South Africa. The ITU computer calculations indicate good probability of reaching the whole audience there. Assistance could be given to RT for the replacement of the underground cable with a radio link.

25. Recommendations: in view of the fact that the United Republic of Tanzania will be the first front-line State to acquire efficient transmission capability to reach South Africa, it is recommended that it should be assisted in replacing its present underground cable Studio to Transmitter Link with a VHF or UHF Radio Link. Furthermore, assistance could be given in the form of spare parts for the new transmitters as well as staff training, thus:

(\$US)

(a) Studio to transmitter VHF or UHF Link for one programme.	
Estimated cost .....	50 000
(b) Spare parts for the new 100 kW HF transmitters.	
Estimated cost .....	150 000
(c) Maintenance and training.	
Estimated cost .....	100 000
(d) Total capital cost estimate .....	<u>300 000</u>

#### V. ZAMBIA

26. Radio transmitters: the Zambia National Broadcasting Corporation (ZNBC) uses two 50 kW HF transmitters, which were manufactured in 1972. It was reported to the survey team that ZNBC experiences problems in maintaining these transmitters in good operational service.

27. Antennas: the antennas used by ZNBC for the External Service to South Africa are of the type which the ITU computer calculations indicate as suitable for the service. No information was made available to the survey team on the operational condition of these antennas, but ZNBC suggested that their replacement would be easier than their modification.

28. Conclusions: the present HF transmitters are probably of the same type and age as those already discarded by the United Republic of Tanzania. In any case, for the present study the possibility of using these antennas is ignored. It seems probable that the same building presently housing the old transmitters can be used to house the new transmitter recommended. For this reason, in the cost estimate, only a nominal sum is included for building, refurbishing and modifications. Concerning the Studio to Transmitter Link, no particular mention was made to the survey team about this link. Thus, it is assumed that such a link exists in good operational condition.

29. Recommendations: Transmissions from Zambia to South Africa will be significantly improved by the following:

(\$US)

(a)	One 100 kW HF transmitter of modern technology and capable of easy retuning to any frequency in the range 6-21 MHz. Estimated cost .....	1 500 000
(b)	One set of dipole curtain antennas of type HR/2/2/0.5 covering the band 6-21 MHz. Estimated cost .....	500 000
(c)	Diesel engine/generator stand-by power supply. Estimated cost .....	100 000
(d)	Equipment subtotal .....	<u>2 100 000</u>
(e)	Freight, insurance and installation of items (a) (b) and (c). Estimated cost .....	500 000
(f)	One set of spare parts. Estimated cost .....	150 000
(g)	Maintenance and training. Estimated cost .....	100 000
(h)	Miscellaneous subtotal .....	<u>750 000</u>
(i)	Building modification requirements. Estimated cost .....	30 000
(j)	Total capital cost estimate .....	<u>2 850 000</u>
(k)	Annual operating costs (local) .....	250 000

VI. ZIMBABWE

30. Radio transmitters: the Zimbabwe Broadcasting Corporation (ZBC) has two 100 kW HF transmitters. All transmitters operate below rated power at present, owing to lack of funds to replace the output and modulator tubes. ZBC also has a 400 kW MF transmitter that has been out of service for several years, owing to the high replacement cost of its output and modulator tubes, lack of spare parts and operating expenses. It is claimed that when this transmitter was operating, its groundwave coverage extended over most of Zimbabwe and that its night-time skywave coverage extended over the whole of South Africa because of the considerable power radiated at high elevation angles from its quarter wavelength high-mast radiator.

31. Antennas: ZBC has seven HF antennas, three capable of accepting 20 kW and four capable of accepting 100 kW. All antennas are designed for short distances,

i.e., within Zimbabwe. However, some power is radiated at low angles reaching some parts of South Africa. The quarter wavelength mast radiator, like its high power driving transmitter, is not used at present.

32. Future plans at ZBC: the immediate plans of ZBC are concentrated at extending the FM coverage of the country. ZBC has studied two alternatives for the establishment of an external service. The first, using a 100 kW HF transmitter feeding alternately several log periodic antennas, which would effectively cover the whole of South Africa; the second alternative would be to use a 500 kW HF transmitter feeding several high gain, low elevation antennas for reaching India, South America, North Africa and a log-periodic antenna for South Africa.

33. Conclusions: Zimbabwe is better located (than Zambia, Angola and the United Republic of Tanzania) for the objectives of the present study and most importantly, the government officials met and expressed indifference to the possible reactions from South Africa if such a service is implemented.

34. Recommendations: transmissions from Zimbabwe to South Africa can be achieved using one 100 kW HF transmitter. Owing to the large range of distances from Zimbabwe to parts of South Africa, it is necessary to use two sets of antennas - one for the short distances and the other for the long distances. Transmissions from Zimbabwe to South Africa will be significantly improved by the following:

(\$US)

(a)	One 100 kW HF transmitter etc. Estimated cost .....	1 500 000
(b)	One set of dipole curtain antennas of type HR 2/2/0.5 covering the band 6-21 MHz for long distances. Estimated cost .....	500 000
(c)	One set of dipole curtain antennas of type HR 2/1/0.5 covering the band 6-21 MHz for short distances. Estimated cost .....	400 000
(d)	One set of duplicated STL programme links between Gweru PTC exchange and Guinea Fowl. Estimated cost .....	50 000
(e)	One diesel engine/generator stand-by power supply. Estimated cost .....	100 000
(f)	Equipment subtotal .....	<u>2 550 000</u>

	(\$US)
(g) Freight, insurance and installation for items (a) (b) (c) (d) and (e). Estimated cost .....	550 000
(h) One set of spare parts. Estimated cost .....	150 000
(i) Maintenance and training. Estimated cost .....	100 000
(j) Miscellaneous subtotal .....	<u>800 000</u>
(k) Building requirements. Estimated cost .....	150 000
(l) Total capital cost estimate .....	<u>3 500 000</u>
(m) Annual operating costs .....	250 000

#### VII. SUMMARY OF REQUIREMENTS

35. The estimated costs of the assistance needed by the broadcasting organizations recommended, as estimated by the consultant in the present reports are as follows:

	<u>Capital costs</u> \$US	<u>Annual operating costs</u> \$US
Angola	3 050 000	250 000
United Republic of Tanzania	300 000	--
Zambia	2 850 000	250 000
Zimbabwe	<u>3 500 000</u>	<u>250 000</u>
	<u>9 700 000</u>	<u>750 000</u>

36. Considering the level and type of technical and financial assistance that would be required, the Secretary-General proposes to consult the appropriate specialized agencies - in particular ITU and UNESCO - and funding programmes of the United Nations system, with a view to determining the most appropriate means of responding to the needs identified in the present report. He would keep the General Assembly informed of developments in this regard.

ANNEX

NAME OF ORGANIZATION:

DATE:

INFORMATION GIVEN BY:

TITLE:

NAME OF TRANSMITTING STATION:

CO-ORDINATES:

TRANSMITTERS (existing or planned for year)\*

No.	Power kW	Frequency	Programme	Manufacturer	Type	Year	Operational conditional

ANTENNAS (existing or planned for year)\*

No.	Service area	Programme	Frequency range	Maxi- mum power (kW)	Azimuth of maximum radiation	Width of main lobe	Gain dB	Angle of elevation**	Type

\* Delete as applicable.  
\*\* For FM - antenna effective height.

SUGGESTED IMPROVEMENTS: