

REPORT ITU-R BS.2105*

Information relating to the HF broadcasting service

(2007)

Radiocommunication Working Party 6E has received a number of input documents providing information on the HF broadcasting service. Although these documents have been taken into account in the revision of the draft CPM text for WRC-07 Agenda item 1.13 it was felt that they contained a lot of valuable information which may of use in the future. Consequently, the contents of these documents have been used to create a preliminary draft New Report.

Table 1 shows the spectrum allocated in Region 1 to the broadcasting service from 30 March 2009 in the range 4-10 MHz. Note that the amount of spectrum allocated in other regions, and the percentage, is different.

TABLE 1

Spectrum allocated to the broadcasting service in the range 4-10 MHz

Broadcasting service			
Exclusive allocations (kHz)		Co-primary allocations (kHz)	
5 900-5 950; 5 950-6 200; 7 200-7 300; 7 300-7 400 7 400-7 450; 9 400-9 500; 9 500-9 900		4 750-4 850(T); 4 850-4 995(T); 5 005-5 060(T)	

Exclusive (kHz)		Co-primary (kHz)	
1 050	17.50%	300	5%

Co-primary (kHz)		
300	5%	FIXED, AERONAUTICAL MOBILE (OR), LAND MOBILE

Annex 1 provides an analysis of an Asia-Pacific Broadcasting Union (ABU) survey on broadcasting service requirements, Annex 2 provides an analysis of a European Broadcasting Union (EBU) questionnaire on future requirements for HF broadcasting, and Annex 3 provides revised HF broadcasting statistics.

* Considering the position of Syria on behalf of the Aran States (Saudi Arabia, Bahrain, Djibouti, Egypt, United Arab Emirates, Jordan, Kuwait, Lebanon, Morocco, Mauritania, Qatar, Syrian Arab Republic and Tunisia) with regard to the work on WRC-07 Agenda item 1.13, Syria continues to object to the content of this Report.

Annex 1

Results of ABU survey on broadcasting requirements

Need for additional spectrum

The need for additional spectrum for the broadcasting service has been clearly established, based on the data provided by the regional coordination groups operating, and established, the provisions of Article 12 of the Radio Regulations. An independent ABU survey among its shortwave broadcasters, amounting to around half the world's shortwave broadcasters, clearly established the need for additional spectrum to the tune of 20%. A cumulative total of 3 360 kHz is available for consideration under Resolution 544 (WRC-03), which would give considerable scope to satisfy the main point of the agenda item.

Spectrum congestion and monetary loss

The current congestion in the HF broadcasting bands results in severe co-channel and/adjacent channel interference among the broadcasting services, making these either totally unintelligible to the listeners or quite impaired in quality. Administrations incur substantive expenses on these services in terms of programme (content) production, transmission operations and in transmitting the services through high power shortwave transmitters. The transmitting infrastructural facilities needed are quite extensive and include vast antenna fields, together with complicated antenna changing operations. The electric supply charges are also huge amounts. However, because of the interference situation, the entire effort and the funds expended become a dead loss as no service is rendered¹.

This factor alone emphasizes the need for additional spectrum to be allocated to the broadcasting service.

Broadcasting considerations

Allocation to broadcasting service and transition

- 1) ABU strongly approves of and supports the case for extra broadcasting spectrum as indicated in Resolution 544 (WRC-03). The ABU encourages administrations to satisfy this need while recognizing the need for adequate spectrum of other potentially affected services in the range 4-10 MHz and innovative ways and approaches to address that issue outside of normal strategies, e.g., more efficient and dynamic sharing between fixed and mobile services, more intelligent use of spectrum in a hierarchical security system where risk assessment decides spectrum use for security.
- 2) ABU supports adequate compensation to the spectrum loss to other services as a result of satisfying Resolution 544 (WRC-03).
- 3) A sufficiently long transition period will be a pivotal factor to help management of that transition by administrations.
- 4) ABU supports the approach that an adequate transition mechanism be set up by WRC-07 in a new resolution to meet this need, e.g., addressing the problem right now but with a solution that gets implemented slowly but definitively.

¹ To get an idea of the loss involved, considering an average cost of transmission to be USD 2 000 per hour. Out of the 12 000 h of transmissions every day, currently about 33% are facing interference. This amounts to a cumulative loss of about USD 2 890 800 000 (2 000 x 12 000 x 0.33 x 365) suffered by the administrations.

- 5) ABU's view is that after implementation of the necessary extra spectrum for the Broadcasting Service, administrations will have little need for scheduling broadcasting transmissions outside the procedures for RR Article 12 in the bands below 10 MHz or in the Tropical bands. Administrations may need to generally discourage such activity.
- 6) ABU supports the view of some administrations that additional frequency allocation is described in the Resolution 544 (WRC-03) and only broadcasting service should be given more frequency spectrum in the bands 4-10 MHz.
- 7) ABU does not favour revisiting the 7 MHz area in relation to the amateur service.
- 8) ABU does not consider the "No change" method as satisfying this agenda item.

Sharing of spectrum

- 1) Exclusion of the bands associated with RR Appendices 25, 26, 27 and 17 Part B leads to a situation where the discussions are mainly focussed on the fixed, land mobile and broadcasting services and partly to the maritime service. This narrowing of the agenda item makes make full alignment for the services very difficult. Full alignment however is possible but extremely difficult and therefore not envisaged as a viable option in the short to medium term.
- 2) The HF frequency range, including below 10 MHz is of critical importance to defence radio communication services and their respective users. Therefore, unconstrained access to the existing spectrum resources allocated to the fixed and mobile services between 4 MHz and 10 MHz will remain an essential requirement for administrations. Current and future operational capabilities require higher data rates and will result in the need for additional HF spectrum under certain scenarios of usage.
- 3) Some administrations are considering sharing scenarios to the fixed- and mobile services to provide additional bands from which to select the most suitable frequency, particularly when using adaptive control techniques. This will positively mitigate the concerns of some of the users of fixed and mobile services, although mobile services will argue that such mitigation may not be enough. The WRC is encouraged to take a more realistic and pragmatic view.
- 4) Such sharing arrangement may be implemented by the introduction of digital technology, adaptive control techniques for the fixed – land mobile – and maritime mobile services offering dynamic frequency selection, and the application of appropriate assignment rules.
- 5) ABU supports the need for increased sharing between services in the HF bands as the only way to satisfy many conflicting requirements simultaneously.
- 6) Spectrum sharing between the broadcasting service and other services in the bands is not generally feasible. Time sharing of the frequency channels is not a practicable proposition and needs to be ruled out, however where it can work, it could be considered further based on the needs of both services involved.
- 7) Some administrations believe that, prior to any changes to the HF channel plans, actual usage, coordination, and deployment of HF systems by the existing services should be taken into account for each service's requirements along with the technical solutions.
- 8) Many factors have emerged during the preparations for WRC-07, some of them having a strong degree of consensus. ABU acknowledges the role of adaptive systems in achieving most effective and flexible way of operating within limited spectrum resources. Widespread adoption of such strategies will pave the way for identifying additional spectrum (250/800 kHz) needed for the broadcasting service.
- 9) Some administrations intend to promote the sharing scenario in portions of the new Appendix 17 bands between the fixed- land mobile and maritime mobile services in order

to realize extra spectrum for the broadcasting service. This may be fully examined and supported by all interested administrations.

- 10) While some administrations take a negative view of other administrations' broadcasting into their territories, it should be clearly borne in mind that this agenda item deals with spectrum issues and spectrum is needed for each administration to do its own broadcasting as well, so that aspect is very important for all administrations with any view.

Annex 2

Analysis of results from a European Broadcasting Union (EBU) questionnaire on the future requirements for HF broadcasting

1 Background

The Agenda for the International Telecommunication Union (ITU) World Radio Conference to be held in 2007 (WRC-07) includes an item (1.13) dealing with, among other things, consideration of additional spectrum for the broadcasting service in the range 4-10 MHz. Broadcasting statistics derived from the operational database created by the informal coordination groups under RR Article 12 confirm the need for additional spectrum to reduce the level of congestion. However, these are just for previous and current broadcasting seasons. To complete the justification for additional spectrum, a forecast of HF broadcasting requirements is needed for the mid- and long-term future (10 years or more). A questionnaire, shown in Appendix 3 to this Annex, was designed by the EBU to enable an initial response on the justification for additional HF spectrum.

Alongside existing analogue services, one of the issues for the mid- to longer term future is the impact the use of digital modulation techniques will have on spectrum requirements. The recommended digital system for the HF bands is Digital Radio Mondiale (DRM). Transmissions using DRM were officially launched on 16th June 2003 to coincide with WRC-03. In February 2006, more than 600 DRM transmitting hours per day are on air.

It is recognized that providing a realistic forecast for 5 years or more is very difficult. However, providing the "best guess" forecast will be very helpful in determining spectrum needs for the HF broadcasting service into the future.

2 Results of the analysis

Appendix 1 to this Annex provides the detailed analysis of the replies to the Questionnaire based upon 26 replies from which the following main features may be extracted:

A) Future plans regarding HF frequency requirements (Q.6)

For the next 10 years

- More than 55% of the respondents anticipate increasing their HF requirements.
- About 27% of the respondents anticipate having the same HF requirements.
- 8 % of the respondents anticipate reducing their HF requirements.
- The remaining respondents cannot anticipate.

For the next 15 years

- More than 31% of the respondents anticipate increasing their HF requirements.
- About 23% of the respondents anticipate having the same HF requirements.
- 4% of the respondents anticipate reducing their HF requirements.
- The remaining respondents cannot anticipate.

Partial conclusion

HF spectrum occupancy is unlikely to decrease in the coming 10 to 15 years.

B) Usage of digital modulation (DRM) in the HF bands (Q.7)

More than 60% of the respondents are planning to use DRM in HF in the coming 10 to 15 years.

C) Target areas and service periods (Q.8)**Europe**

More than 60% of the respondents will target Europe during breakfast, driving and evening-times. However, there will be a high number of transmissions all day long.

Africa

More than 50% of the respondents will target Africa during morning and evening-times.

Middle-East

About 50% of the respondents will target Middle-East during morning and evening-times.

Asia

More than 50% of the respondents will target Asia during morning and evening-times.

Americas

About 50% of the respondents will target Americas during morning and evening-times.

Oceania

More than 20% of the respondents will target Oceania during evening-times.

Partial conclusion

Peak time broadcasting in most targets is forecast to be morning and evening.

Appropriate transmissions will require, in general, the usage of the bands located in the 4-10 MHz HF spectrum.

D) Co-program and co-timed DRM and Analogue transmissions (Q.9)

During a transition period, (5 to 10 years) broadcasters will not give up analogue transmissions and may transmit to some targets in analogue and DRM.

After a transition period (beyond 10 years), broadcasters will mainly use DRM.

Partial conclusion

DRM will be progressively introduced and will not replace very quickly the analogue transmissions.

Appendix 2 to this Annex provides the list of organizations having responded and those from which replies were still awaited at the date of issuing the present Report².

3 Overall conclusion

From the EBU Questionnaire it is recognized that providing a realistic forecast for 5 years or more is very difficult, however it may be concluded from the results:

- HF broadcasting will still be used in the next 10 to 15 years.
- HF spectrum occupancy is unlikely to decrease in the next 10 to 15 years.
- DRM will progressively replace analogue transmissions.
- Peak-times, such as morning and evening-times and also continuous transmissions to relatively small regional targets, such as Europe, will require the operation of HF frequencies in the 4-10 MHz bands.

Appendix 1 to Annex 1

Summary results

Questionnaire on future requirements for HF broadcasting organizations replying

Q.1 Name of Organization	Q.2 FMO	Q.3 Organization	Q.4 HF bands for broadcasting	Q.5 type of broadcasting
Austrian Broadcasting Services	ORS	SP ⁽¹⁾	Yes	International
Bulgarian National Radio	BUL	PSB ⁽²⁾	Yes	International, National and Local
Odasiljaci I Veze d.o.o.	HRT	SP	Yes	International
Radio Prague	TCH	PSB	Yes	International
Télédiffusion de France (TDF)	TDF	SP	Yes	International, National and Local
Radio France Internationale (RFI)	TDF	PSB	Yes	International
Arbeitsgemeinschaft des öffentlich-rechtlichen Rundfunkanstalten des Bundesrepublik Deutschland (ARD)/Institut für Rundfunktechnik (IRT)	DWL	PSB	Yes	International

² A new release of this analysis will be issued to include further replies on the Questionnaire

Q.1 Name of Organization	Q.2 FMO	Q.3 Organization	Q.4 HF bands for broadcasting	Q.5 type of broadcasting
Deutsche Welle	DWL	PSB	Yes	International
Hellenic Radio (ERA)	ERA	PSB	Yes	International
Hungarian Radio	HNG	PSB	Yes	International
Jordanian Radio and Television	JRT	PSB	Yes	International
Radio Netherlands	RNW	PSB	Yes	International
Rádiodifusão Portuguesa	RDP	PSB	Yes	International, National and Local
Societatea Romana de Radiodifuziune	ROU	PSB	Yes	International, National and Local
Sentech LTD	SNT	SP	Yes	International, National and Local
Radio Nacional de España	REE	PSB	Yes	International
Turkish Radio-Television Corporation	TRT	PSB	Yes	International, National
Emirates Media Inc.	EMI	PSB	Yes	International
VT Merlin Communications	MER	SP	Yes	International
BBC World Service	MER	PSB	Yes	International
Broadcasting, Radio- communications & TV	RRT	SP	Yes	International
Trans World Radio – Asia, Guam	FCC	CB ⁽³⁾	Yes	International
Family Stations, Inc.	FCC	RB ⁽⁴⁾	Yes	International
Adventist World Radio	AWR	PB ⁽⁵⁾	Yes	International
Radio Miami International	FCC	CB	Yes	International
Vatican Radio	VAT	PSB	Yes	International

(1) SP: Service Provider

(4) RB: Religious Broadcaster

(2) PSB: Public Service Broadcaster

(5) PB: Private Broadcaster

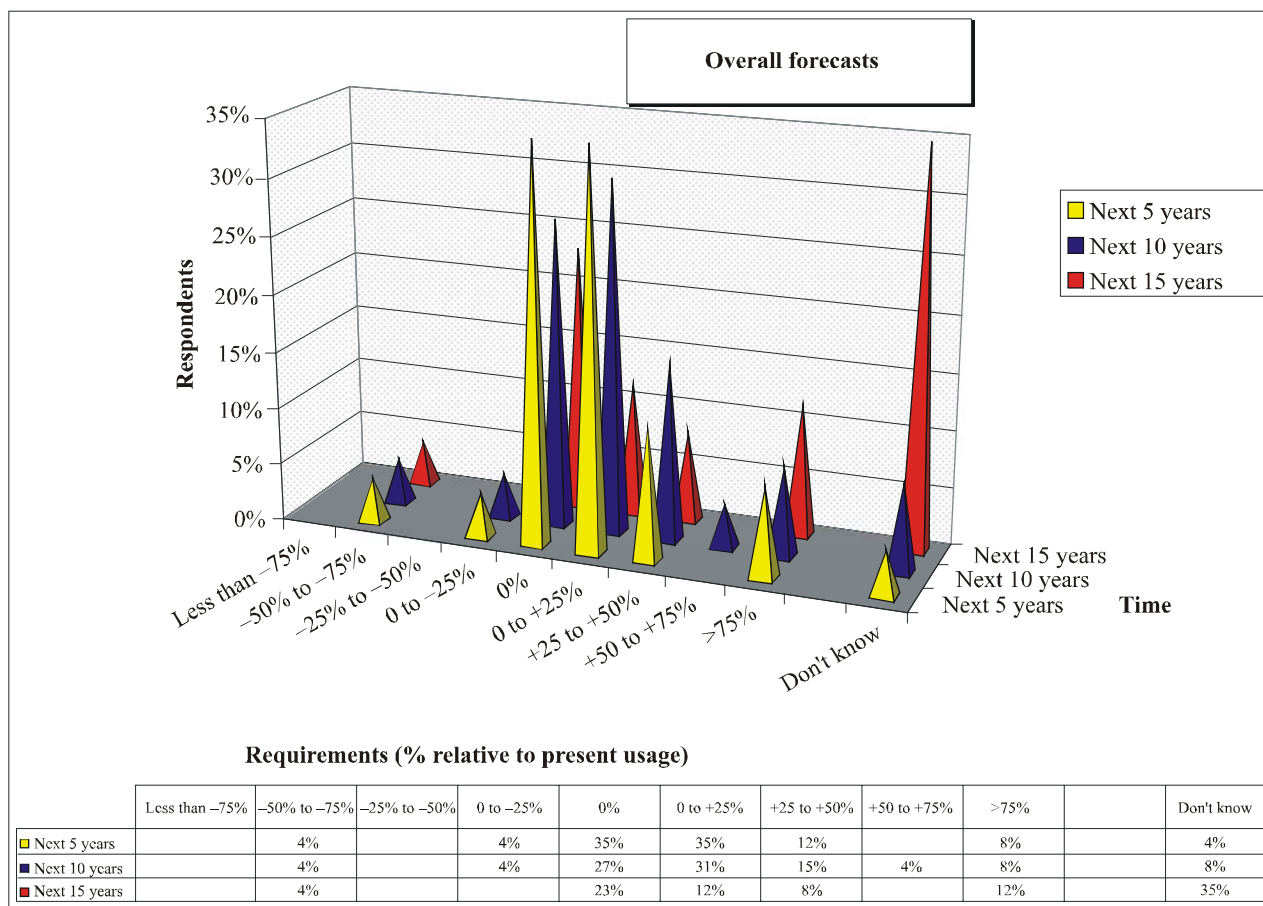
(3) CB: Commercial Broadcaster

Q.6 If you use or are considering using the HF bands, what are your future plans regarding HF frequency requirements compared to current usage? If you are considering changing your current usage, can you also please estimate the extent of change in HF spectrum usage if possible?

The results are shown hereafter using two different presentations.

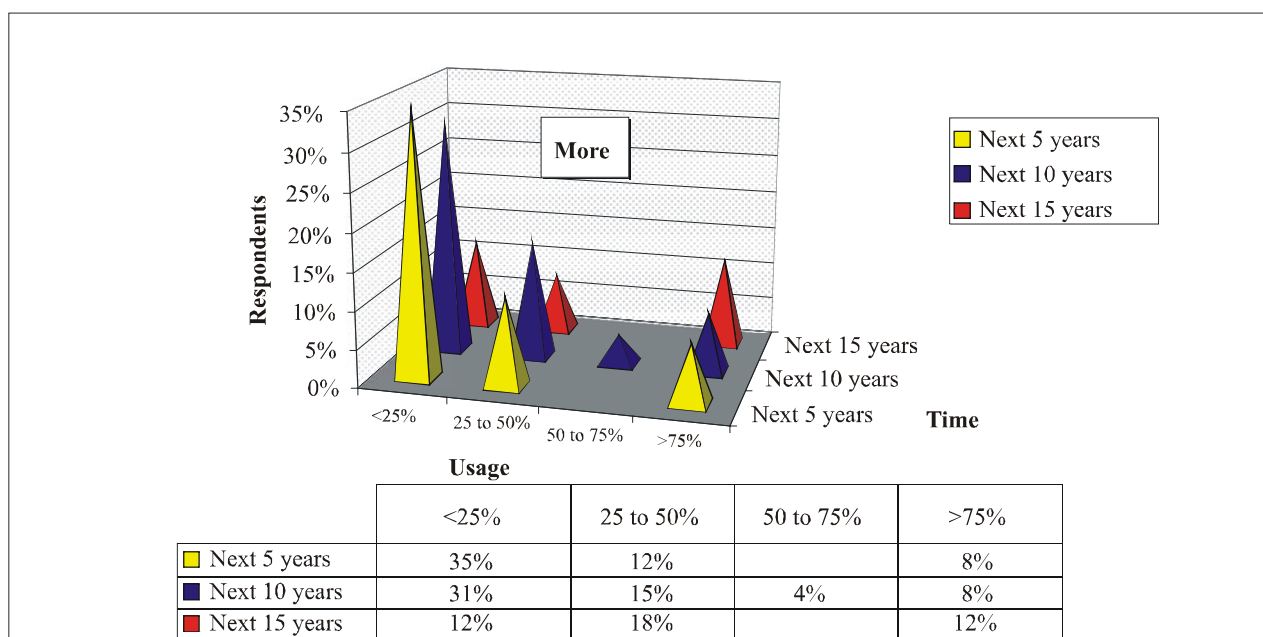
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Presentation 1

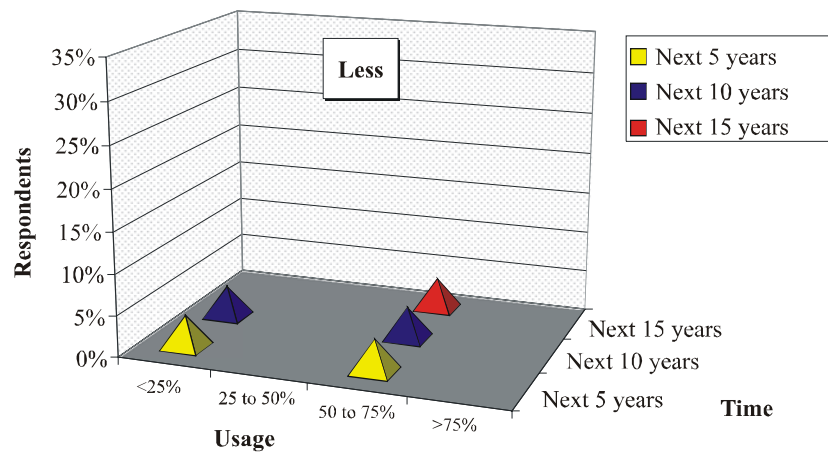


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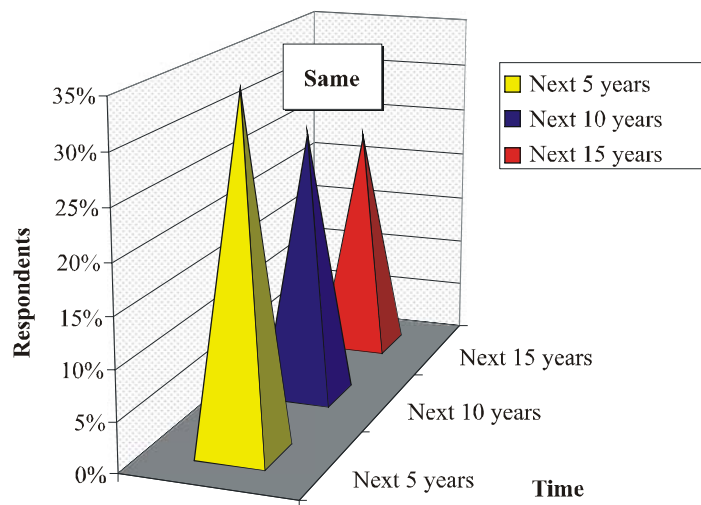
Presentation 2



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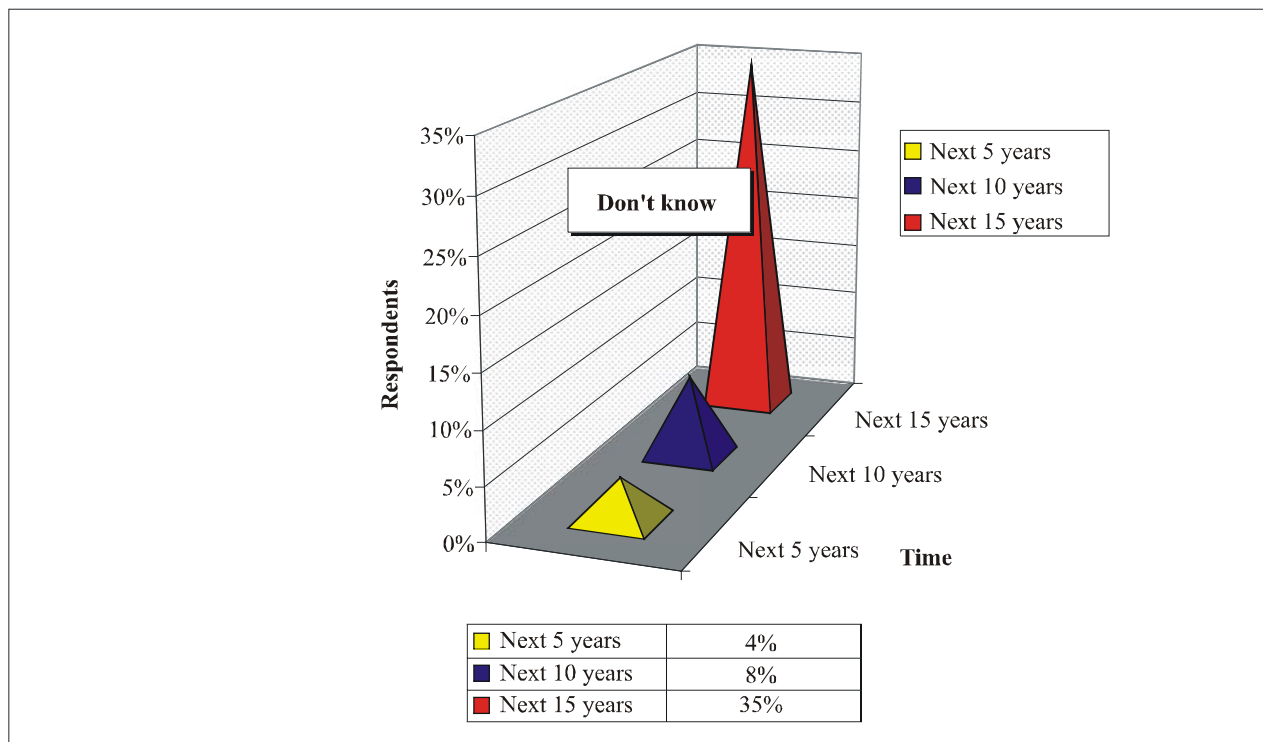
	<25%	25 to 50%	50 to 75%	>75%
Next 5 years	4%		4%	
Next 10 years	4%		4%	
Next 15 years			4%	



Next 5 years	35%
Next 10 years	27%
Next 15 years	23%

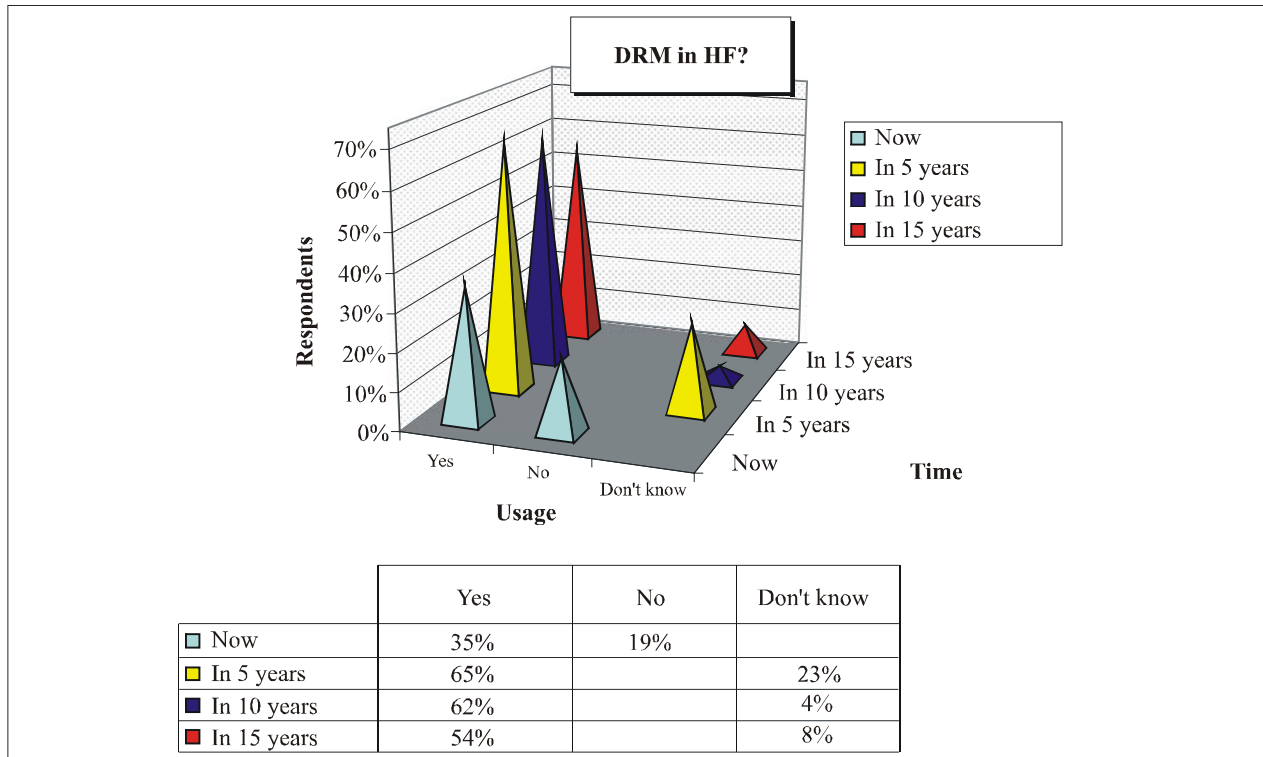
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Q.7 Do you use or are you planning to use digital modulation (i.e. DRM) in the HF bands?



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