Current Technical activities of the EBU

P. Laven
Director, EBU Technical Department

This article examines the principles underlying the technical activities of the EBU as it moves forward into the 21st century. In particular, it stresses the need to continue providing high-quality technical information for the benefit of EBU members, including advice on equipment purchasing. The work of the EBU Project Groups should be made available not only to the technical areas of EBU members but also to inter-disciplinary groups, where appropriate.

Further, the EBU must pay great attention to the development of specifications and/or standards that enable interoperability of products from different manufacturers. EBU members, at the national level, have the responsibility of ensuring that spectrum regulators and/or administrations are well aware of the needs of broadcasters. The article concludes with an overview of the benefits of holding virtual conferences, in a drive to keep down the travel costs of members.

Introduction

The 50th anniversary of the founding of the EBU presents an opportunity for us to look back at the history of the EBU. In this issue of the EBU Technical Review, Rudolf Gressmann, one of my predecessors as Technical Director of the EBU, outlines the EBU's technical activities from the 1950s through into the mid-1980s [1]. During this period, the EBU successfully played a major role in resolving many technical challenges on behalf of its members and, crucially, laid the foundations for many of our current activities.

The 50th anniversary is also an opportunity to consider how the EBU's technical activities will evolve in the future. The introduction of digital broadcasting and the Internet caused dramatic changes in the 1990s. Looking forward, it seems certain that technological developments will continue to accelerate in the early part of the 21st century. Some

observers predict that these changes will irrevocably disrupt the basis of "traditional" broadcasting. What roles could, or should, the EBU play in this period of "technological uncertainty"?

In this respect, Article 2 §1 of the EBU Statutes state that:

The objectives of the EBU are to serve the interests of its members in the programme, legal, technical and other fields, and in particular to support its active members in their mission to serve the interests of the general public in the best possible manner.

Three generations of EBU Technical Directors. From the left, Rudolf Gressmann (1974 - 1985), George T. Waters (1985 - 1997) and Philip Laven (1997 -), seen here at the EBU's 50th anniversary celebrations at Lucerne, Switzerland, in early July 2000. *(All photos in this article taken by Roger Miles.)*

The key principle is obviously that of *"serving the interests of members"*. This is easily stated, but it can be difficult to achieve in practice due to the diversity of the EBU's membership. There is no such thing as an "average" member of the EBU. Different members face very different economic and competitive circumstances, as well as different technical or legal problems. What may be appropriate for one member may be totally inappropriate for another member. Nevertheless, there are many common problems, especially in the technical areas. For example, all members can benefit from standardization activities and from the EBU's activities in the field of spectrum management.

It is important to stress that the technical activities of the EBU are not limited to the efforts undertaken by staff of the EBU Technical Department in Geneva. Most of the work is actually undertaken by the staff of individual members within EBU Project Groups. The successes of the EBU are heavily dependent on the spirit of generous mutual collaboration between EBU members.

Information exchange

As in the past, a primary activity for the EBU must be to provide technical information for the benefit of its members. Early warnings of technological developments are essen-

tial. In particular, it is essential to identify those technologies that could be a threat or an opportunity for EBU members.

It is natural that engineers should be deeply interested in the details of technical systems. However, such familiarity with the details can obscure unbiased analysis of future trends or market factors. As we have seen all too often, technical superiority does not necessarily lead to success in the marketplace. Technical staff throughout EBU members must be

Some further images from the EBU's 50th anniversary celebrations in Lucerne.

to assist their colleagues in assessing the strategic implications for broadcasters of new technologies. This role will become even more important in the next few years, given the increasing complexity of choices for production and distribution systems.

Advice on equipment purchasing?

EBU members often ask for authoritative advice on the choice of hardware from specific manufacturers. In other words, they would like to see clear recommendations from the EBU about whether they should buy equipment from manufacturer X, Y or Z. There is no doubt that "naming names" and sharing practical experiences (good and bad) of specific products would be a popular service – if the EBU were able to offer it. In practice, the EBU deliberately avoids such recommendations.

In the past, the EBU sensibly recommended specific tape formats for programme exchange – but it encountered great difficulties when it tried to go further by recommending that broadcasters should use specific formats for general production.

With the benefit of hindsight, we can see that any attempt to harmonize equipment purchases across the diversity of EBU members was almost certain to fail. The reality was (and still is) that EBU members have many valid reasons for purchasing different equipment. At one extreme, a broadcaster might insist that, almost irrespective of price, all of its equipment should have the widest range of technical features to satisfy its most demanding production staff. At the other extreme, the lowest possible price might be the dominant requirement. In practice, very few EBU members take such extreme positions. However, there are many other individual constraints, such as preferring that new equipment should be from the supplier of existing equipment or, at least, be compatible with existing equipment. Such policies are entirely logical because they can ensure interoperability, as well as simplifying operational training and maintenance.

Furthermore, technology does not stand still: even if EBU members could agree on the criteria for selection of the preferred format, today's choice of format is liable to be quickly superseded by a new format offering equivalent or better facilities at a lower price. There are many arguments in favour of not reacting too quickly to such changes, but it is not clear how or when the EBU could abandon its recommended format – presumably after all of its members had thrown their equipment away! It may not be easy to agree common formats, but it would be much more difficult to abandon previously agreed formats.

Additionally, EBU members are reluctant to "publish" their experiences with products from particular manufacturers. At first sight, this might seem unreasonable because unbiased information from previous customers would be hugely beneficial to prospective purchasers, such as other EBU members. The problem is quite simply the danger that some manufacturers would take exception to any criticisms of their products. In the worst case, a manufacturer might take legal action over circulation of "negative" infor-

Abbreviations

AES	Audio Engineering Society	**FTP**	File transfer protocol
API	Application programming interface	**ITU-R**	International Telecommunication Union, Radiocommunication Sector
CEPT	European Conference of Postal and Telecommunications Administrations	**MHP**	(DVB) Multimedia Home Platform
DVB	Digital Video Broadcasting	**SMPTE**	Society of Motion Picture and Television Engineers (USA)
EPG	Electronic programme guide		

mation about his products. Even if a user felt confident that his practical experiences were entirely valid, his legal advisers would need to be persuaded that there was little or no prospect of legal action if details of these experiences were to be disseminated to third parties.

Such a situation actually occurred during preparations for dealing with the millennium "bug". Although individual EBU members had identified some problems with specific equipment, publication of such information could result in legal action if equipment was accidentally listed in the wrong category (e.g. safe or unsafe). As a result of such concerns, the planned systematic exchange of information via the EBU website did not materialize.

Despite such difficulties, it is obvious that participation in EBU meetings facilitates bilateral contacts between technical staff of EBU members, thus encouraging fruitful exchanges of detailed information on a confidential basis. Although the EBU cannot take any responsibility for such exchanges, it is clear that those attending EBU meetings place great emphasis on personal contacts and on informal conversations during coffee breaks.

Standardization policy

Instead of recommending the purchase of specific equipment, the EBU pays great attention to the development of specifications and/or standards that enable interoperability of products from different manufacturers. This promotes competition between manufacturers, whilst also ensuring that users are not "locked in" to the products of a single manufacturer.

This process is not new. For example, joint activities initiated by the EBU and SMPTE in the early 1980s resulted in ITU-R Recommendations 601 and 656 for digital video production [2][3]. Similarly, the AES/EBU digital audio interface [4] is now ubiquitous. Such standards ensured that broadcasters could purchase equipment from different sup-

pliers, secure in the knowledge that the standardized interfaces would ensure compatibility. Some people argue that standardization is becoming unnecessary in the Internet age, but there is no doubt that these basic building blocks have resulted in genuine competition between suppliers and in reduced prices of equipment for all broadcasters, not just EBU members.

Similar considerations apply to standardization of all elements of the broadcast chain. The EBU's policy is to concentrate on open standards for production and distribution systems. In addition to the benefits cited above, standardization of distribution systems can allows EBU members to compete with other broadcasters on fair terms and conditions (e.g. basic transmission standards, plus standards for EPGs, APIs, etc.).

Telecommunications operators have long recognized the benefits of open standards. After all, who would buy a mobile phone that was only able to communicate with mobile phones operating on the same network? The reality is that all telephones must be able to interoperate will all other telephones, whether they are fixed-line telephones or mobile phones anywhere in the world.

Curiously, the broadcasting community has not accepted the fundamental need for interoperability on a worldwide basis. This is probably because television developed on the basis of national standards – often deliberately chosen to be different from other countries in the belief that this would protect a country against imports of foreign-made television sets or, indeed, foreign programmes.

Although digital satellite broadcasters conform to the basic standards developed within the DVB Project, individual pay-TV operators have selected incompatible systems (such as conditional access systems or APIs) in order to prevent their customers "churning" to the pay-TV services offered by their competitors. Such barriers to free competition are arguably contrary to the emerging consensus in favour of liberalized markets. Interestingly, some of the pay-TV operators now appear to have realized that mergers with other operators can be impeded by incompatible standards. Not only are they faced with incompatible systems for subscriber management, but also for interactive services.

Broadcasters have long suffered as a result of the need for conversion between different TV standards. Such problems will seem trivial in comparison with the problems caused by incompatible APIs: interactive elements associated with digital TV services are, almost by definition, designed for a specific hardware and software "platform".

There are several different APIs in use with digital TV services in Europe. Consequently, when services are to be delivered to different platforms, the interactive applications will need to be re-written for each platform. DVB-MHP promises to overcome this problem by using "plug-ins" to emulate the behaviour of "legacy" APIs, but this is not a complete solution because existing receivers will not be able to operate with DVB-MHP services.

Such problems are a foretaste of problems likely to face broadcasters in the near future. Lack of standardized interfaces can give undue power to "gatekeepers" who can take

control of specific elements of the value chain. In this respect, the critical importance of APIs as a potential "gateway" was recognized at an early stage by the EBU Technical Committee. Unfortunately, there was little chance of progress on standardization of APIs until all the other players could be persuaded that this was not just desirable, but essential. After a long struggle within the DVB Project, agreement has finally been reached on the DVB-MHP specification.

In summary, interoperability of equipment and software from different suppliers encourages competition, thus hopefully leading to open access and reduced costs for broadcasters (and for consumers).

Collaboration

One of the fundamental roles of the EBU is to encourage collaboration between members. In the technical area, Project Groups are established to examine important technical issues (with specific deliverables and timescales). Such Project Groups are essentially meetings of "experts" who share their knowledge with other experts, in order to provide guidance for all EBU members.

A recent EBU technical conference in Ankara, Turkey.

Although the EBU is founded on the principle of solidarity between members, it would be naïve to assume that EBU members are entirely altruistic. From the perspective of individual members, participation in such Project Groups can be very beneficial – "their" expert in a specialized field has the opportunity to exchange information with other experts. Furthermore, such collaborative efforts allow members to get better value for money from their technical activities because:

- ⇨ the workload is shared amongst EBU members (rather than individual members having to undertake all the work by themselves);
- ⇨ the results tend to be better than those achieved by an individual expert working in isolation.

The results of such work are naturally made available to all EBU members – not solely to their technical areas but, where appropriate, also to inter-disciplinary groups. Inter-disciplinary activities are growing in importance because, as mentioned above, much of the

technical work is devoted to providing strategic guidance to EBU members. In the past, most of the technical activities within the EBU were targeted at the needs of Technical Directors (or equivalents) of members. Now, it is encouraging to note that real interest in such work is expressed by many Directors-General.

Spectrum management

A key area of collaboration between members is that of spectrum management. For many years, demand for the radio spectrum has exceeded supply. This situation will get much worse in the near future due to the growth of mobile telephones, wireless access to the Internet, plus demands for new broadcast services.

EBU members need access to radio spectrum for new radio and TV services, whilst protecting their existing services. In recent years, the EBU has successfully pursued a policy of close collaboration with the CEPT because of its key role in spectrum issues throughout Europe. Historically, EBU members have had strong influence on spectrum matters related to broadcasting. The reason is quite simple: the EBU has long been a respected source of technical expertise on the planning of broadcasting services. The EBU must build on its track record of success at Wiesbaden in 1995 and Chester in 1997. As the 1961 Stockholm Plan is likely to be revised by an ITU Conference to be held in 2005, it is clear that the EBU must now develop appropriate software tools for the planning of digital TV services.

At the national level, EBU members have the responsibility of ensuring that spectrum regulators and/or administrations are well aware of the needs of broadcasters.

Working methods

One of the greatest problems facing the EBU over the last 50 years has been the geographical separation of its members. It is simply not cost-effective to hold 3-hour meetings if most of the participants have to spend the rest of the day (or more) travelling to and from Geneva. Telephone conference calls can be valuable but the promised benefits of video-conferencing have not yet become a reality. Consequently, most people believe that, at present, there is no good substitute for face-to-face meetings. Even so, it is obvious that the cost and time of travelling to meetings prevent greater participation in EBU technical activities.

One area where new technologies have already helped is in the distribution of documents. For about three years, working documents have been distributed to members via the Internet (by e-mail, FTP or web access). This initiative has accelerated the distribution process – as well as in extending the reach of EBU documents beyond the offices of Technical Directors!

Every year, the EBU Technical Department holds several conferences or seminars on technical subjects for the benefit of its members. Such events typically last one or two days. In recent times, some of these events have become so popular that it has become difficult to accommodate all of the participants in the meeting rooms in Geneva. In future, we may have to restrict attendance by accepting bookings on a "first come, first served" basis. Fortunately, in the near future, we may be able to allow remote viewing of such events via the Internet. The Internet is not yet able to deliver reliable video streaming at bit-rates of 50 kbit/s – other than images slightly larger than postage stamps that are refreshed every few seconds.

A typical technical conference at EBU headquarters, Geneva.

Fortunately, experience shows that there is little value in transmitting live video from a conference because video images consume large amounts of bandwidth, whilst containing minimal information. This is one area where our experience of TV broadcasting can help us to understand the users' requirements. Normal TV programmes are occasionally subject to technical failures. Many programmes can continue if the video fails but the sound is satisfactory. Conversely, most programmes have to be abandoned if the video is OK, but the sound fails. This demonstrates the importance of the audio in communicating information – especially at conferences where the audio is the primary source of information, often coupled with images or text on slides.

The logical solution is to transmit audio plus electronic copies of the slides over the Internet to remote computers, thus allowing local and remote copies of the presentation to be synchronized with the streaming audio. Some experiments with such technologies will be undertaken in the next few months in the hope that many EBU members will be able to benefit by attending such virtual conferences – not just in real time but also by downloading presentations and audio at a later date.

Work programme

The EBU Technical Committee oversees the technical activities of the EBU. The Technical Committee takes this responsibility very seriously – and devotes considerable effort to effective management of such activities. Every year, it also undertakes a detailed review of the activities of the Technical Department. The primary objectives of this process are:

- ⇨ to ensure that the work programme of the Technical Department meets the needs of EBU members;
- ⇨ to ensure cost-effectiveness in the work of the Technical Department.

Conclusions

At present, we are experiencing a period of unprecedented technology-led developments. Perversely, this coincides with decisions being taken by several EBU members to reduce their internal technical activities. This paradox means that the technical activities of the EBU are likely to become more valuable to EBU members than in any previous period.

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