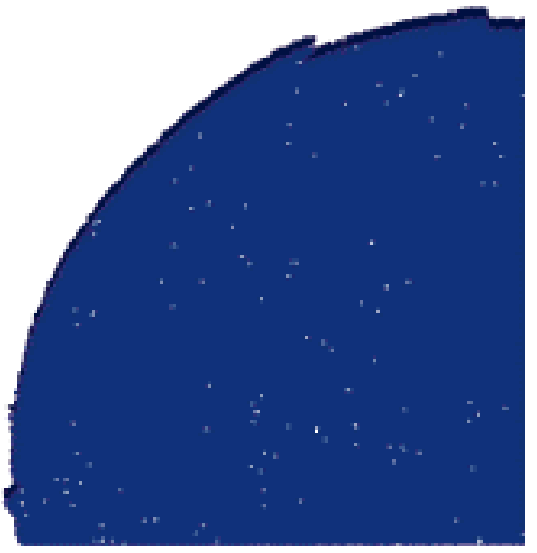
CALL FOR COMMENTS

February 2003

Summary of call for comments

Concerning the modification of Dolphin Telecom's authorisation to establish and operate a digital professional mobile radio (PMR) network open to the public

---



ART Autorité de Régulation des Télécommunications
www.art-telecom.fr

Contents

1 Results of the public enquiry

The request for modification seeks to release Dolphin Telecom from complying with the standard stipulated in the specifications appended to the authorization, on the grounds that compliance would not allow the company to upgrade to broadband capability.

Any change to the operating conditions specified in the authorization must meet requirements for transparency, objectivity and non-discrimination, as set out in French law on post and telecommunications. For a fuller appraisal of the consequences of modifying the authorization, ART called a public enquiry on 22 October 2002, inviting comments on the projected modification. This call for comments procedure had been used in a similar case on a previous occasion, concerning a request for application of a new standard.

ART received a total of 564 replies, from respondents that can be categorized as follows:

Current Dolphin clients	488
Potential Dolphin clients*	26
Major PMR users	11
Trade and other associations	5
Consultants and installation companies	10
Miscellaneous (administrations, PMR operators, etc.)	6
GSM/UMTS operators	3
GSM operator associations	1
Non-French operators	4
Dolphin Telecom	1
Equipment manufacturers	9

* The "potential clients" category is formed from respondents who declared they were not clients but had tested the network and were considering subscribing.

Input for the public enquiry took the form of answers to twenty questions. Many respondents did not reply to all the questions. Regardless of whether they answered the actual questions asked, most respondents, especially the Dolphin Telecom clients, offered an opinion regarding Dolphin's request for modification.

This summary seeks to reflect the breadth of often divergent ideas and opinions on the questions asked. For clarity, the questions are listed as they were presented to respondents.

2 Summary of call for comments

2.1 Technological aspect

Question 1.

To your knowledge, what are the data transfer services provided by the TETRA standard release 2 and/or the CDMA-PAMR system?

Question 2.

What is the expected availability date for medium- and high-speed TETRA solutions?

Question 3.

The TETRA standard includes a number of PMR services and functions. Which ones should be available regardless of the standard used?

Question 4.

Which of the services listed in Dolphin Telecom's L 33-1 authorisation must be available?

Question 5.

The CDMA-PAMR offers PMR services by way of a software application. Can this system be considered as a PAMR system like TETRA is?

On data service aspects

One respondent detailed different TETRA solutions that should support medium- and high-speed data services:

- TETRA release 1 with multislot function, offering data rates up to 28 kbit/s
- TETRA release 2 TAPS, offering high throughput for data services only
- TETRA release 2 TEDS, offering high throughput with support for voice and data services

Several respondents considered that CDMA-PAMR technology and the TETRA upgrade (TETRA release 2) would support the same data services: short data transfers in realtime, databases interaction, file download/transfer and image transfer. Among these respondents, two operators claimed that it would not be possible to transmit voice and data simultaneously with TETRA 2, but other respondents observed that the standard did support simultaneous voice and data transmission.

One equipment manufacturer claimed that the TETRA release 1 standard supported SDS, status service and data transfer in IP packet mode up to 28 kbps (multislot), and that TETRA release 2 (TAPS), based on EDGE technology, would allow data transfer up to a theoretical maximum of 473 kbit/s, though datarate in practice would be from 80 to 160 kbit/s. According to this respondent, TETRA release 2 (TEDS) would support practically realizable datarates of 100 kbit/s. This respondent claimed to have observed CDMA datarates of 40 to 80 kbit/s, averaging at 43 kbit/s

Another equipment manufacturer, citing ETSI needs analysis to define the content of TETRA release 2, reported that most needs are met with datarates from 50 to 150kbit/s. However, a third company claimed that datarate from 200 and 300 kbit/s would be required to meet data transfer needs.

One operator indicated that TETRA release 2 TAPS supported datarates up to 384 kbit/s, mentioning that TAPS only supported services whereas data TETRA release 2 TEDS supported simultaneous voice and data services. This respondent claimed that CDMA-PAMR did not support push-to-talk or optimized management of group calls, and noted that PMR functions were supported by GSM-R.

On expected availability of medium- and high-speed TETRA solutions

One respondent stressed that no supplier would have gone ahead with multislot (7.2 to 28.8 kbit/s) under TETRA release 1, and noted that product release dates for TETRA release 2 were uncertain (three years for some vendors, and no project announced for others).

Several respondents mentioned that specifications were available (or at the public enquiry stage) for TETRA release 2 TAPS and had been approved by the ETSI TETRA project. One such respondent even stated that a public enquiry was under way on a project to split the band into 200 kHz channels.

One industrial company claimed that the multislot function under TETRA release 1 would be available by the first half of 2003, at data rates up to 28 kbit/s.

One industrial company considered that standardization under TETRA release 2 TEDS should be completed by the end of 2003, and indicated that a TETRA release 2 TAPS offer could ship soon, depending on demand.

According to another equipment manufacturer, schedules of standardization and frequency harmonization for high-data rate applications appeared in phase with expected market take-off.

On "universal" PMR/PAMR services and functions

Individual and group push-to-talk services with fast connection set-up and network availability were the services cited most often by respondents as basic PMR/PAMR functions. To this list, one operator added services such as emergency calls, low-throughput data transmission in packet mode, dynamic management and change to groups/fleets, and location. One manufacturer further added simultaneous voice/data capability and remote terminal programming.

On question 4, respondents agreed almost unanimously that all the services and functions figuring in the Dolphin Telecom authorization should be renewed, and that technology change should not have any impact on this section of the specifications.

However, one equipment manufacturer considered that the services listed in the specifications with the authorization were barely sufficient to qualify as PAMR, and would have liked to see service obligations reinforced under a modification to the authorization in order to credibilize the PMR aspect.

CDMA-PAMR: PAMR system like TETRA ?

Some respondents emphasized that CDMA-PAMR offered all essential PAMR-type services and that this system did constitute a PAMR system. For these respondents, a PAMR system should be defined on the basis of services, independently of technology.

One cellular network operator estimated that the latency time from push-to-talk initiation and start of conversation should be close to 10s with CDMA-PAMR, compared to 500 ms with TETRA. Since proper push-to-talk functionality was not provided, the system could not properly be considered a PAMR system.

This operator also declared that CDMA-PAMR was not standardized by ETSI or ITU. The document describing CDMA-PAMR was nothing more than a draft System Reference Document (SRDoc) submitted by a vendor (Lucent) to a CEPT working group, and approval for this type of document came under the responsibility of the ETSI ERM/RM group. Since the ETSI approval process could not begin before January 2003 (next meeting of ETSI/ERM/RM group), it would be premature to statute on the Dolphin request.

According to Dolphin Telecom France, to effectively offer PMR services via a software application, the CDMA-PAMR was adapted and optimized at radio interface protocol level and infrastructure level. Dolphin also reported that TETRA applications were supported by software.

For one non-French PAMR operator, CDMA-PAMR was not an IMT 2000 system like CDMA2000, since the CDMA-PAMR system implemented only some parts of the CDMA standard for CDMA2000, most of which were different from those used for meeting the general objective of IMT 2000, namely mass-market reach.

Several respondents declared that under all technologies, there were always software applications developed on top of the hardware.

One industrial company asserted that the software application did not improve performance, which was dependent on the infrastructure. This company reasoned that the service delivery time was the sum of infrastructure delay and application delay. It also mentioned that CDMA-PAMR was an add-on to CDMA cellular standards, and that upgrade would also follow these standards, meaning that upgrade to the CDMA standard might not integrate future PMR characteristics.

One operator considered that a distinction should be made between the standards themselves and the types of service that could be provided using equipment implementing these standards. According to this operator, CDMA-PAMR was not a standardized system, despite the fact that it was based on a radio interface derived from the IMT-2000 family.

Many respondents insisted that the CDMA-PAMR system was based on the CDMA2000 radio interface standard, which was itself a radio interface of the IMT-2000 family.

One industrial company noted that radio specifications (TIA documents) only covered full-duplex links, and that push-to-talk group calling was only apparent, with spectral efficiency of group calls suffering seriously as a result. For the time being, the CDMA-PAMR system could only be considered a public radiotelephony system offering a few additional PMR capabilities.

One cellular network operator argued that CDMA-PAMR was not properly speaking a standard, since it resulted from no inter-manufacturer and inter-operator work. Rather, it was a proprietary system (from Qualcomm).

According to one cellular network operator, CDMA-PAMR should be considered an IP technology coupled with PMR functions, since it is based on a CDMA-1X radio interface and frequency bands with downgraded PMR applications. This operator felt that in the absence of an experimental network for providing voice-on-IP services over mobile networks, there

would be no guarantee of service quality. Voice-on-IP services were considered of low spectral efficacy.

2.2 PMR and PAMR market

Question 6

Are the PMR and/or PAMR needs for voice and data currently being fully met? If not, why not?

Question 7

Do you believe there is a need for medium- and high-speed PMR and/or PAMR services? If yes, how soon?

All respondents responded in this section. Though input from Dolphin Telecom clients did not always answer the actual questions asked, it was admitted for our summary of response to these two questions and to questions 3 and 4. About 50% of clients were connected to the analog network and about 40% to the digital network, with the remainder not specifying which. Overall, they indicated that PAMR did meet their needs.

Rather than stating, as asked in question 6, whether or not their needs were met, 95% of Dolphin Telecom clients stated that they needed one or more of the functions or specificities offered by the Dolphin Telecom network.
Over 50% of respondents said that Dolphin Telecom was the only provider able to offer them a professional service reserved for professionals. Some mentioned that the equipment was also professional (robust) and that Dolphin Telecom was attentive to their needs.

Over 80% stated that they used and needed the instantaneous push-to-talk function, and over 30% stated that they used and needed the group call function. It was repeatedly pointed out that these functions were not available from other networks. Over half the respondents mentioned fixed-price billing with unlimited calls as an additional advantage of the Dolphin offer.

The need for an operated network was insinuated in most responses and explicitly stated in about 20%. Reasons cited included coverage (not realistically achievable if a company has to run its own network) and the need for a turnkey solution (with coverage, terminals, training and customer support).

Network availability was another major concern. Nearly 30% mentioned the advantage of non-saturation even at peak periods, especially at emergency service locations.

Regarding data transmission and expected complementary services, over 90% of respondents mentioned a desire for complementary offers from Dolphin Telecom. Of these respondents, about a third simply said they were favourable to the upgrade request because this would enable Dolphin to offer them new, though unspecified, functions. The remaining two thirds did specify one of more such functions.

Among respondents expecting upgrade, the application the most often cited (in one third of instances) is GPS radiolocation. But some Dolphin clients declare that they have this function on the TETRA network. A quarter of expectations are expressed for transfer of files, folders and messages, though no input is given on expected file size or datarate.

About 15% of respondents would like to use card readers (for medical record and bank cards) or barcode readers. The size of the data for transmission should be compatible with the current standard (Tetra 1). One respondent in ten would like to be able to send drawings or video images.

Data transmission expectations are very real, but appear to be regarded as a necessary upgrade rather than an immediate need. Expectations are most often expressed in terms of applications rather than datarates.

Data transmission requirements among the 26 "potential client" respondents were mostly rather vague, as regards times and applications. (These respondents were testing or had tested the Dolphin digital network, and supported the upgrade request but had not actually taken the decision to become a network client.) One respondent had submitted a concrete project for a "mobile office for technicians and salespeople" to Dolphin. Five explained that they had so far held back from subscribing to the network because coverage was not yet sufficient.

For the six trade and other associations, current PMR/PAMR needs could be met if coverage and frequency availability were sufficient, which is not always the case. One association saw data transmission needs as increasing, while two others saw no significant needs for high-speed capabilities over the next five years.

Respondents in the "consultants and installers" and "miscellaneous" categories generally considered that data transmission needs existed or would emerge. However, input was fairly divergent on this point, with some clients expressing high-throughput needs now and others considering that high-throughput needs would take several years to emerge. Others also spoke of emerging added-value services.

Overall, equipment manufacturers considered that they would be experiencing high-datarate needs, but did not specify when.

One major PMR user did express high-datarate needs and regretted that Dolphin had not developed data services as supported by the Tetra standard, but the other respondents in this category expressed no such needs for the time being. They did, however, voice concern regarding availability of frequencies for private digital use in the 410-430 MHz band, and the existence of parallel digital standards.

2.3 Implications of authorization for Dolphin Telecom to operate the CDMA-PAMR system in the 410-430 MHz band

Question 8.

Players are invited to express any concerns they may have regarding an authorisation for Dolphin Telecom to use an IMT 2000 system such as CDMA 2000 in the 410-430 MHz band.

One cellular network operator considered that since CDMA-PAMR implemented a CDMA 2000 radio interface, itself defined as belonging to the IMT 2000 family, CDMA-PAMR should be considered a general-purpose 3G system, eligible solely for integration in the 2 GHz band, and subject to the 3G licence allocation procedure.

One trade association considered that the Dolphin CDMA-PAMR upgrade programme would directly compete with future UMTS operators, for the following reasons:

- A subset of CDMA-PAMR functions would suffice for consumer applications, and even if Dolphin did not explicitly address the consumer market, this market would be addressed automatically owing to the large number of sole-trader businesses in France.
- Dolphin estimated its global market at 700,000 clients, with around 8000 network subscribers today. To fulfill its potential and profitabilize further investment, it would necessarily be seeking a majority share of this market, of evident interest to cellular network operators.

2.4 Competition and specificities of Dolphin Telecom business, and operations authorized under 3G procedure

Question 9.

ART requests comments on the difference between:

- ***The activities of a public network operator and public telephone service provider for professionals currently practiced by Dolphin Telecom and which the operator wishes to extend to include CDMA 2000***
- ***The activities covered by the authorisation granted by the application procedures for third-generation mobile systems belonging to the IMT 2000 family of standards.***

Question 10

To what degree do these activities compete? Do either of them have any unique characteristics with respect to the other?

Most respondents stated that PMR/PAMR met their specific needs and professional requirements for communication services. Professional networks were perceived as differing from consumer networks primarily in the offer of shorter set-up time (usually under two seconds), push-to-talk capability, group calling and priority network access. The network remained available even under emergency conditions, whereas consumer networks would be saturated by exceptionally high call concentration. Users appreciated fixed-price billing (independently of call duration), and the PAMR network also offered turnkey solutions, with coverage, terminals, customer support and training.

Dolphin Telecom noted that this professional market weighed just 2% of the consumer mobile market, and that its network could not address the consumer market, since it had a maximum capacity of 200,000 subscribers.

Some respondents considered that CDMA-PAMR technology differed from IMT 2000 since it addressed professional needs in the PAMR segment. One respondent observed that this technology would support a range of services (semi-duplex voice mode (push-to-talk), group calls, priority calls, status service, short message transmissions, packet-mode data transfer, simultaneous voice/data, dynamic hierarchical group management) different from those offered by IMT 2000 technology (mobile internet, photo transfers, video streaming, on-line games, 2 Mbit/s data transfer from different types of terminals, and business nomad services including secure access, e-mail and intranet). This respondent considered that CDMA-PAMR upgrade to support 3G services would require integration of new applications and other aspects of CDMA radio technology, but that the operator's frequency resources would be insufficient.

Some respondents felt that these activities would compete with 3G services as soon as a PMR/PAMR operator began to deploy cellular network technology. However, one respondent considered that frequency range, spectrum and technology factors might inherently limit CDMA-PAMR to professional users, meaning that it would only compete with cellular networks on the professional segment. It would therefore suffice to ensure that the technology change was restricted to a constant band, with no prospect of extension to neighbouring bands. Another respondent considered that the networks would not compete if clients subscribed to both voice and data services under a single professional PAMR subscription.

Cellular network operators, equipment manufacturers and trade associations opposed to the modification considered that the same market was addressed, and that competition would come into effect as soon as PMR/PAMR coverage restrictions were lifted to allow nationwide reach, open to the public with authorization to provide telephony service using the same technology (IMT 2000) as authorized 3G operators. For these respondents, Dolphin Telecom would be able to offer 3G services to any user, professional or not, independently of its PMR offers. Requalification would shift the balance of 3G competition, with the new entrant benefiting from a licence allocated outside the usual 3G procedure and free of the usual financial constraint entailed by comparable spectrum usage. This would raise the issue of equal access rights, especially since the Dolphin network would enjoy exclusive use of frequencies in the 400 MHz band, with coverage facilitated on this band owing to propagation conditions.

According to 3G network operators and one equipment manufacturer, Dolphin's current licence does not allow it to develop operations other than PMR/PAMR. These respondents requested that network upgrade should proceed under the Tetra 2 standard promoted by European regulatory organizations if the operator wished to concentrate on the professional market, but if it wished to develop a CDMA network, this should be pursued under the same conditions (spectrum, coverage, fees) and under an equivalent procedure to that governing applications for 3G network operation.

One manufacturer considered that since the professional market (tens of thousands of users) would be too small for network profitability, a PAMR operator would seek to win over cellular-network customers (starting with company heads) by offering high-throughput data capabilities ahead of UMTS.

Two respondents considered that Dolphin's target of 700,000 terminals could not be reached given that analog and digital PMR and PAMR together account for no more than 500,000 terminals in France today. The operator would therefore be obliged to target the cellular network market and request band extension, to the detriment of the PMR industry.

Several respondents claimed that whereas a non-operated PMR market was legitimized by special voice-traffic needs such as push-to-talk and group calls, the same could not be said of an operated PMR market for nationwide voice services. This was evident from the difficulties experienced by Dolphin in this sector. According to these respondents, there was no PMR/PAMR-specific need for medium- and high-speed data transmission. Corporate data-transfer needs had been identified and would shortly be addressed by operators' specific UMTS offers, which would be one of the driving forces behind successful, profitable 3G rollout in France.

Several manufacturers and trade associations noted that upgrade toward medium- and high-speed data transfer services for PMR/PAMR would be necessary, but should be progressive. Since it could not be considered an immediate need, TETRA and TETRA 2 should be encouraged instead of authorizing CDMA-PAMR, which would break the evolutionary chain of PMR/PAMR development.

Some respondents considered that CDMA-PAMR technology would require several MHz from the outset, thereby restricting room for manoeuvre at a time when flexibility was important, given that future needs were poorly identified and current needs not adequately met. Premature allocation now would prevent more judicious planning of this part of spectrum to address genuine PMR/PAMR needs in the future. There were also fears that CDMA would restrict the choice available to smaller businesses with special needs, such as DMO and single-site networks. Moreover, imbalance between meeting needs in densely populated urban areas and sparsely populated rural would jeopardize the development of services needed by businesses and supplier companies, by impeding sustainable return on existing investment, and this would eventually lead to disappearance of PMR. It was important that businesses not covered by the CMDA solution should enjoy continued access to the services they needed, and the opportunity to access other narrowband and forthcoming broadband networks.

2.5 Technical aspects regarding the optimisation of spectrum use

Question 11.

What are the technical reasons which would justify a possible opening in France of the 410-430 MHz frequencies to the IMT 2000 systems, in addition to the bands identified at a worldwide level and still available in France?

Question 12.

Are there any specific technical characteristics inherent to the activity of an IMT 2000 network operator for professionals which would make the bands set aside globally for IMT 2000 mobile networks unsuitable for this type of activity?

Question 13.

If the 410-430 MHz frequencies were made available in France to IMT 2000 systems, are there technical reasons which make this band better suited to a mobile network operator targeting professionals rather than to a mobile network operator targeting the general public?

Harmonisation of the 400 MHz band

Several respondents observed that at European level, CEPT and ETSI have studies under way on harmonisation of the 400 MHz band. One outcome will be to determine whether or not CDMA-PAMR, which has not as yet been standardised, can be considered a full-fledged PAMR technology. The only way to be sure that the CDMA technology and other standardised technologies can coexist without excessive wasting of spectrum in guard bands is through detailed, in-depth studies. The findings of those studies, focusing on such issues as interference and coordination in border areas, will be fundamental to the future European

framework. These respondents claimed it was premature at this point to allocate frequency resources to the technology in this band, before the findings of those studies were published.

Three respondents considered that the spectral efficacy of deploying a broadband technology in a narrowband spectrum was not proven and that, consequently, problems of sideband compatibility would necessitate a large guard band.

According to Dolphin Telecom, CEPT is currently conducting studies on the coexistence of narrowband and broadband systems. In this operator's view, the studies will conclude that digital networks are less sensitive to interference than analog networks. An adequate guard band would eliminate the risk of interference with CDMA-PAMR, which uses a 1.25 MHz bandwidth, and, were coordination agreements reached, the networks using that technology could deploy in border areas, provided they complied with the required field levels.

One respondent recalled that the French authorities had come out against fragmentation of the frequency bands identified for IMT 2000 and, to the contrary, for harmonisation to achieve economies of scale and enable global roaming. This respondent stressed the difficulties that would arise in border-area coordination of CDMA deployment if the European administrations did not opt for the same bands and technologies, owing to the lack of harmonisation of the 410-430 MHz and 450-470 MHz bands to support IMT 2000 systems.

400 MHz spectrum for PMR

Many of the respondents considered the 400 MHz band well suited to PMR/PAMR because its propagation conditions allow national coverage with fewer stations, thereby lowering infrastructure costs. This band is not, however, suited to the requirements of cellular networks because it cannot be used in densely populated areas.

Three such respondents felt that a cellular network could not be deployed in that band, which must remain allocated to PMR/PAMR regardless of the technology chosen. Only part of the UHF band is available for PMR/PAMR, but not enough to meet the whole of demand, particularly given the strained situation in very busy areas like the Ile de France region or the Paris-Lyon-Marseille axis, as well as in border areas.

400 MHz spectrum for IMT 2000 systems

Several respondents considered that there was no valid reason for opening the 410-430 MHz band to IMT 2000 systems. The advantage of that band stems from its better propagation conditions, which would lower the costs of coverage in sparsely populated rural areas or during the initial stages of network deployment. However, because of the band's fragmentation and the limited amount of available spectrum, it could not be accessible to all IMT operators. As a result, one operator would be in a monopoly situation within the band.

For the same reasons, three other respondents concluded that a dense, high-capacity network could not be deployed in the band.

A manufacturer agreed that there was no valid reason for opening the 410-430 MHz band to IMT 2000 systems. Should the capacity of the spectrum allocated to IMT 2000 networks not suffice, other bands could be considered, but not the 400 MHz band. This manufacturer recommended opening another part of the spectrum, under international coordination, in order to ensure a satisfactory offer consistent with economic criteria.

Bands identified for IMT 2000 systems considered suitable for professionals

Three operators considered the bands identified at worldwide level for IMT 2000 suitable for a third-generation cellular network capable of meeting the needs of "professional" or "corporate" type markets.

In contrast, one manufacturer felt there was no real reason IMT 2000 bands could not be used by PAMR systems, whether Tetra, Tetrapol or CDMA-PAMR.

One manufacturer recalled that the factors making for profitable deployment of a network for professionals are the large urbanized areas and the transit routes interconnecting those areas, regardless of the frequency band used for this type of coverage.

Bands identified for IMT 2000 systems considered unsuitable for professionals

Two respondents replied that the intent in identifying the bands for IMT 2000 had not been to meet the needs of a professional mobile operator. The amount of frequency resources up for allocation in the 3G licensing procedure was too large for that activity. Furthermore, deploying a network that covered the area in that band extensively for a small client base would require too many base stations for the investment to pay back. One of the two pointed out that in Europe, no professional mobile operator had succeeded in obtaining frequency resources in the IMT 2000 band; the other respondent considered that a system deployed in bands identified on a worldwide level, offering both PAMR and 3G services, would nevertheless be an advantageous option for all cellular and PAMR operators.

2.6 Need for other systems in the 410-430 MHz bands

Question 14.
Players are invited to express any needs for other systems in these bands.

The major PMR users are concerned about the lasting future of an offer specifically intended for professionals. Some do not have any immediate data needs, or have voice needs that are presently met by Dolphin Telecom.
Certain respondents feared that the CDMA-PAMR technology might threaten the development or even existence of their networks. One such respondent had fears regarding the future of the frequencies attributed, situated in the middle of the spectrum allocated to Dolphin Telecom, because the operator, were it to use the CDMA technology, would need a continuous band. Several emphasized the importance of ensuring coexistence and addressing their needs. One of them would be interested in having frequencies for low-band UHF digital private networks in the Ile de France region, a possibility not currently available. Another was

prepared to continue with the Dolphin Telecom operated network but wanted to be sure the terminals just acquired would not have to be replaced, given the investment made. According to one respondent, an operated network is not always the solution to specific needs, and in its case analyses conducted jointly with Dolphin Telecom showed that an operated solution would be technically and financially incapable of covering its needs.

Some respondents, as trade and other associations, foresaw no real high-datarate needs by a large number of users emerging over the next five years. In their view, the network cannot be made profitable on the basis of professional clients alone, so the offer will have to be broadened, but then it could well cease to address professionals' specific needs. Clients whose needs are not covered by the CDMA-PAMR network should continue to have access to a narrowband network and eventually to a broadband network.

Some consultants and installation companies claimed that the market must rely on new technologies to take off, but most of those respondents did not specify which should be chosen. One of them indicated that all of the capabilities in the Tetra 1 standard are not currently offered in the market. Another wanted a spectral allocation to be secured for digital private networks.

The French Ministry of the Interior recalled that the needs of safety and emergency forces in the 380-430 MHz band were not met. It hoped nothing would be undertaken until the task force created recently by ANFR to deal with these issues had completed its work.

One respondent observed that, should Dolphin Telecom plan to run its existing network under the Tetra standard until 2007 in the areas already covered, the change in standard would not address an immediate need in those areas. According to this respondent, the needs of the independent networks should be met regardless of the type of technology considered, but given the limited bands allocated to PMR, substantial modification of the spectrum in favour of those networks appears unlikely.

Another respondent pointed out that there will still be a significant market for conventional and digital networks and that the demand to be met for digital private networks will keep the need for spectrum high. It would be difficult, this respondent felt, to restrict the needs of a network open to the public such as Dolphin Telecom's to 2 x 4 MHz in the 400 MHz band. The solution would be to shift this network to 900 MHz or to the IMT 2000 bands, assuming it is CDMA-authorised and cannot stay within the band designated for Tetra. This shift would bring about a reorganisation of the 400 MHz band in favour of PMR.

One PMR operator wanted to be sure that the networks would be protected in adjacent bands in the event of coexistence with a network using the CDMA technology. Radiolocation and data transmission were for this respondent two necessarily related functions indispensable in meeting the market's needs.

One manufacturer judged that technologies other than Tetra 2 must be authorised to provide PMR/PAMR services in that band. Operators' needs differ depending on the client segment they manage, and a single technology would not be the best solution to consider.

According to Dolphin Telecom, the spectrum that will be freed in the 450-470 MHz band should cover the future needs of PMR/PAMR systems, and only technologies supporting deployment of PMR/PAMR services should have access to that band. The existence of a

PAMR operator, in its view, makes for better management of the spectrum and complementary services fitting clients' needs.

2.7 Appropriateness of opening the 410-430 MHz band to IMT 2000 systems and plans for deploying such networks in this band

Question 15.

Players are invited to express their opinions on the appropriateness of opening the 410-430 MHz band to IMT 2000 systems.

Question 16.

Players are invited to state whether they would be interested in deploying IMT 2000 systems in the 410-430 MHz band, if it were made available to such systems. If yes, for what types of uses?

A trade association of telecommunications equipment manufacturers responded that the frequency bands allocated to PMR/PAMR and harmonised in Europe must continue to be allocated for those applications. It also hoped that no possibilities would be opened for upgrades allowing cellular networks to emerge in PMR/PAMR frequency bands, so as to avoid any distortion of competition with cellular networks.

According to a similar association, IMT 2000 services could not deploy fully and appropriately in that band given the spectrum available. Furthermore, in its view, CDMA-PAMR was not developed as an IMT 2000 service.

Two industrial companies considered that a distinction must be made between CDMA-PAMR and IMT 2000, even though CDMA-PAMR uses a radio technology belonging to the IMT 2000 family of standards. They thought there was not enough bandwidth to deploy an IMT 2000 system in the 410-430 MHz band, but that a CDMA-PAMR system could be deployed there.

Another industrial company noted that the 410-430 MHz band was not identified by CEPT for use by IMT 2000 systems. It judged that IMT 2000 services could not deploy fully and appropriately in that band given the spectrum available and that CDMA-PAMR was not developed as an IMT 2000 service. This company considered that opening the 410-430 MHz band to a CDMA-PAMR system in France alone would constitute both a precedent that could worsen the conditions under which the spectrum is managed and an obstacle to the development of the PMR service.

Yet another industrial company felt it would be inconsistent to integrate a network using the CDMA-PAMR technology into the 400 MHz band, identified for PMR, in that CDMA-PAMR is far closer to GSM and/or UMTS than to PMR systems, and that frequencies for PMR are already lacking in the area neighbouring 400 MHz.

One industrial company considered that the bands utilized for IMT 2000 implementation must be identified on the basis of bands harmonised by UIT for those systems, because the latter ensure critical size and big economies of scale. This company additionally felt that opening the 410-430 MHz band to IMT 2000 systems would have a negative impact on the present

holders of IMT 2000 licences. To the extent that 15 MHz duplex continues to be available in the IMT 2000 spectrum in France, this company sees very little justification for opening other bands to similar services, which would mean the entire 3G licence allocation process would have to be reopened or even renegotiated.

A trade association likewise considered opening the 410-430 MHz band to IMT 2000 inappropriate. Assuming the deployment of a broadband system, this respondent felt it would have to be analysed in comparison with a narrowband system. Thus far, narrowband has proven to offer numerous advantages.

Dolphin Telecom saw the need for differentiating between CDMA-PAMR and IMT-2000. The company deemed that proposing CDMA-PAMR in the 410-430 MHz band was consistent with the expected use of the band. In its view, integrating IMT 2000 into the 410-430 MHz band was not appropriate because the latter had been identified for the provision of PMR services. It claimed any technology capable of offering appropriate PAMR services in that band must be authorised.

A mobile operator saw no valid reason for opening the 410-430 MHz band alone to IMT 2000 systems. It pointed out, however, that there might be justification later on for opening a frequency band below 600 MHz to all operators running an IMT 2000 network, which would complete coverage in very sparsely populated areas. In such a case, the band would have to be harmonised to ensure availability of multiband IMT 2000 terminals.

Another mobile operator considered that until the issue had been examined more comprehensively in Europe or even worldwide, plans in France to open the bands neighbouring 450 MHz to IMT 2000 would be premature. Furthermore, fragmentation of the spectrum available in this band would prevent current users of the UMTS standard from taking advantage of that band, whereas the users of CDMA-2000 could. This operator indicated a lack of interest in the medium run for IMT 2000 deployment in the bands neighbouring 450 MHz.

A third mobile operator considered opening the 410-430 MHz band to IMT 2000 systems premature at the present stage of debate at European level. This operator, however, stressed the vital importance of favouring standards harmonised Europe-wide and internationally by CEPT and UIT. Other frequency bands are being examined, and the question of the 410-430 MHz band could be raised in that context. The blocks of frequencies allocated to 3G operators in the 2 GHz band are now sufficient, and future extension bands have already been set aside at European level between 2.5 and 2.69 GHz.

An operators' association saw no need for opening frequencies to IMT 2000 systems other than those initially planned. Such an approach would seem premature, especially since frequencies are still available in France. This question could be raised again in coming years, but only if the bands already allocated were nearing saturation.

A trade association judged that opening the 410-430 MHz band to a CDMA PAMR system in France alone would constitute both a precedent that could worsen the conditions under which the spectrum is managed and an obstacle to the survival and development of private PMR networks, as well as installers depending on that activity. This association noted that, on an international level, IMT 2000 systems must be run in the 1900-1980 and 2110-2170 MHz bands and that those bands were still available. The 410-430 MHz band, however, has not been identified internationally for use by IMT 2000 systems.

One respondent warned that before opening the 410-430 MHz band to IMT 2000, it would be essential to ensure that CEPT follows that policy. To date, there has been no formal sign that such is the case. The advantage was also stressed of being able to allocate spectrum to each network according to how fast it was gaining ground. This respondent warned against allowing the paradoxical situation to arise whereby, on the one hand, frequencies could not be allocated to operators having fleets of several thousand terminals for lack of resources, and on the other, those frequencies could be frozen by an operator serving only a small subscriber base. Against that background, the argument continued, a CDMA 2000 type network, requiring from the outset several MHz, would impair the flexibility gained by using certain parts of the spectrum for professional networks.

2.8 Rights and responsibilities related to the deployment of an IMT 2000 network in the 410- 430 MHz band

Question 17.

What would the functional and financial rights and responsibilities be for an authorisation to establish and operate a public IMT 2000 network in the 430 MHz band?

Question 18.

If the occupation right to frequencies is modified to permit an IMT 2000 standard, would the amount of the fee, which has been defined for an authorisation under the TETRA standard, have to be revised?

Dolphin Telecom and two manufacturers did not consider CDMA-PAMR an IMT 2000 system, because it concerns the PAMR market and cannot offer the same services as UMTS. They saw no reason for changing the cost structure, in that the TETRA and CDMA-PAMR systems both offer PAMR type services and that fees are calculated on the operators' capacity to offer such services in a limited market.

Moreover, according to Dolphin Telecom, the usual requirements should not be modified, because the target market is unchanged and limited. This operator already pictures being forced to assume the sector's most restrictive requirements, concerning push-to-talk calls, specialised voice capabilities, and network availability. An increase in its financial burden would be passed on to its clients, many of whom operate in the public interest.

One respondent advocated an "equitable" rule, suggesting that a set fee for frequency allocation combined with an annual fee or volume fee should prevail, on a realistic basis given the economic weight of the market concerned. This respondent saw no reason, provided Dolphin Telecom kept its foothold in the professional field, for modifying the fee levels, since the only modification in the licence had to do with the standard used.

For one respondent, technological neutrality demanded that the rate schedules applied by TETRA networks open to the public be identical to those of GSM networks. The same should be true of networks belonging to the IMT 2000 family.

One trade association responded that if the services proposed with CDMA are closer to those of a 3G network, the fee must be structured according to the same principles as 3G fees.

In the view of two respondents, if proof can really be brought, effectively demonstrating that the characteristics of CDMA-PAMR are similar to TETRA's, then the financial basis should be the same. On the other hand, should an operator be able to offer services closer to those of a 3G network, the financial approach would have to be determined accordingly.

The operators and their association viewed plans to open the 410-430 MHz band to IMT 2000 systems as premature, judging that any authorisations concerning technologies in the IMT 2000 family should be subject to financial and other conditions equivalent to those imposed on operators authorised under the 3G application procedure.

Two respondents, a manufacturer and a trade association, felt that, to avoid any distortion of competition, the applicable rights and requirements – especially financial – should be similar to those of general-purpose networks open to the public.

According to one manufacturer, general-purpose 3G operators expect absolutely equal treatment, and such an authorisation would have a major impact on their business plans. In such a case, this respondent foresaw a probability that general-purpose 3G operators will in fact demand that all their licensing conditions be re-evaluated.

2.9 Means of granting an authorisation to operate an IMT 2000 network in the 410-430 MHz band

Question 19.

Do you think it would be possible to automatically modify Dolphin Telecom's authorisation? If yes, would certain rights or responsibilities in Dolphin Telecom's authorisation have to be modified to guarantee competitive equity?

Dolphin Telecom and two manufacturers considered that a CDMA-PAMR system did not constitute an IMT 2000 network in that it offered different services. They deemed approval of Dolphin's application to modify the terms of the licence appropriate, without modification of the associated rights and requirements.

Dolphin Telecom added that the introduction of a new technology does not substantially change the licence nor entail other requirements, which would be prejudicial to the rollout of high-performance PMR services. The operator also saw no cause for rivalry between "general-purpose" operators and Dolphin Telecom.

In one respondent's view, Dolphin Telecom's network must continue primarily as a specific private network and retain only marginally the possibility of "interoperating" with the public network, the justification for holding a L.33-1 licence.

One manufacturer claimed that if the requested modification were granted, it would fundamentally change the competitive environment, adding that such a situation should not arise automatically.

For several trade associations and manufacturers, if authorising Dolphin to migrate towards an IMT 2000 technology were considered, it would be essential to modify Dolphin's rights

and responsibilities (especially financial), in order to align them with those of the other IMT 2000 operators, and to call for applications.

Two operators judged that since Dolphin Telecom's request involved granting an authorisation to a network complying with one or several standards belonging to the IMT 2000 family, the procedure set out in Article L.33-1 V of the French law on post and telecommunications must apply. That article specifies that the number of authorisations may be limited owing to the inherent technical constraints of frequency availability and that, in such an event, the public telecommunications minister, on proposal by ART, publishes the terms and conditions under which authorisations are granted.

Another operator felt that automatically modifying Dolphin's authorisation as suggested could not be considered.

Question 20.

Would the fact that Dolphin Telecom is limited to 4 MHz (no other frequencies are available in the band) prevent competition with the "general-purpose" 3G operators?

Dolphin Telecom and two manufacturers saw that as being the case, since general-purpose 3G operators have 2 x 15 MHz + 5 MHz in the initial phase, which they require in order to offer a large number of simultaneous users services at datarates of up to 2 Mbps. They concluded that Dolphin Telecom would be technically incapable of offering services similar to those offered by general-purpose operators.

In the view of two respondents, an operator offering specialised services for professionals did not compete with general-purpose 3G operators, especially with a spectrum of 4 MHz.

One manufacturer suggested that through adequate positioning, Dolphin could compete with general-purpose operators under good conditions, should its request be approved.

The operators, trade associations and manufacturers considered that such a limitation on spectrum would restrict the network's capacity and the number of clients it could host, but that the level of competition with the UMTS networks would still be appreciable. In their view, this would be unfair competition, particularly during the UMTS start-up phase when only one 5 MHz duplex carrier will be used by each operator.

One operator also feared that Dolphin Telecom might request access to more spectrum at 450 MHz, or even to the 2 GHz and then 2.5 GHz bands in order to develop.