FINAL DECISION ON THE CREATION OF A SPECIFIC CODE IN THE NATIONAL NUMBERING PLAN FOR THE PROVISION OF ELECTRONIC COMMUNICATIONS SERVICES ON NON-PUBLICLY AVAILABLE PRIVATE NETWORKS AND DEFINITION OF CONDITIONS TO BE APPLIED

Index

1. Framework

By determination of 06.08.2008[1], ICP - Autoridade Nacional das Comunicações (ICP - ANACOM) authorized REFER TELECOM - Serviços de Telecomunicações, S.A. (REFER TELECOM) to operate the GSM-R system in the 876 - 880 MHz and 921-925 MHz frequency bands, according to the general authorisation scheme, pursuant to the Electronic Communications Law (ECL), whereby the operation of the system would be subject to compliance with the applicable conditions (article 27 of the ECL), including the technical conditions of Decision ECC/DEC/(02)05[2].

Further to this decision, the National Frequency Allocation Plan was amended with respect to non-publicly available electronic communications networks and services, in order to designate and reserve the above-mentioned frequency bands for the GSM-R[3] system.

For the purpose of rendering its network operational, REFER TELECOM expressed to ICP - ANACOM its need to use numbering resources from the National Numbering Plan (NNP), having requested a mobile network code[4] as well as a national destination code[5].

After a preliminary examination, ICP - ANACOM found that this request from REFER TELECOM could not be fully fulfilled, as resources of type E.164 could not be provided from ranges already created in the NNP, and therefore it would be necessary to define and designate a new service code for that purpose.

The use of numbers depends on the allocation by ICP - ANACOM of rights of use for numbers, and such allocation must take place following open, transparent and non-discriminatory procedures.

According to article 8 of the ECL, where ICP - ANACOM, in the exercise of its powers, intends to take measures which will significantly impact the relevant market, it must

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[1] At http://www.anacom.pt/render.jsp?contentId=636105

[2] Designation and availability of frequency bands for railway purposes in the 876-880 and 921-925 MHz bands (http://www.erodocdb.dk/docs/doc98/Official/Pdf/Dec0205.pdf).

[3] Global System for Mobile Communication - Railway

[4] MNC- Mobile Network Code (ITU-T Recommendation E.212)

[5] NDC- National Destination Code (ITU-T Recommendation E.164)

publish the respective draft decision, giving interested parties the opportunity to comment on it, providing for the purpose a period of not less than 20 days.

Therefore, further to REFER TELECOM's request, ICP - ANACOM deemed it appropriate to submit its draft decision on the creation of a new code in the NNP to the general consultation procedure provided for in the referred article 8, as well as to the prior hearing of the company, under rules provided for in the Administrative Procedure Code (APC).

2. The request

REFER TELECOM requested of ICP - ANACOM the allocation of NNP's E.164 numbering. The company declared that to implement a set of operational requirements it needed ICP - ANACOM to allocate public numbering to its network, supporting its request in EIRENE (*European Integrated Railway Radio Enhanced Network*)[6] standards currently in force, namely the System Requirements Specification - SRSv.15.

In addition, it referred the importance of establishing interconnection between its network and public operators' networks, especially mobile networks' operators, justifying this operational need on the grounds transcribed below:

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- *To enable the communication, per functional address, to and from GSM-R users outside this network's coverage area (on-call staff in their homes, managers and staff in charge out of working hours/places, etc.);*
- *To enable the use of the same radio equipment in cabins of traction units, for communications with the train movements' security, command and control, in areas not provided with the GSM-R infrastructure, using for the purpose the GSM public network;*
- *To enable the provision, on all rail network, of other operational applications which are expected to be supported on the GSM-R/GPRS system, on a transitory basis during the network set-up stage, and definitively in lines not equipped with the respective infrastructure;*

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[6] http://www.uic.org/spip.php?rubrique874

- *To enable the establishment of back-up mechanisms for critical communications, in case of a significant failure of the GSM-R network, in terms of duration and/or extent;*
- *To enable the establishment of calls between GSM-R network subscribers and safety authorities, civil protection and firemen."*

The company submitted also a document entitled "*GSM-R International Network Codes*" by the International Union of Railways (UIC) - **Annex 1** - which breaks down per European country the several types of numbering resources used in GSM-R networks, including a list of E.164 type codes used in different countries.

3. Analysis

3.1. The GSM-R system

According to data available at the UIC (International Union of Railways) website[7], the organization mentioned by REFER TELECOM, the GSM-R is a communication element of the ERTMS (*European Rail Traffic Management System*) system, with the following definition:

> *"GSM-R - Global System for Mobile Communications-Railways - the communication element containing both a voice communication network between driving vehicles and line controllers and a bearer path for ETCS European Train Control System data. It is based on the public standard GSM with specific rail features for operation e.g. Priority and Pre-emption (eMLPP) - Functional Addressing Location Dependent Addressing - Voice Broadcast Service (VBS) - Voice Group Call (VGC) - Shunting Mode - Emergency Calls - General Packet Radio Service (GPRS option) - Fast call set-up."*

In addition, it refers that the GSM-R system is specified by means of functional[8] and system[9] requirements of EIRENE, a system which is defined as follows:

> *"A railway telecommunications system, based on the ETSI GSM standard, which complies with all related mandatory requirements as specified in the EIRENE FRS and SRS. An EIRENE system may also include optional features and these shall*

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[7] http://www.uic.org/spip.php?article381

[8] FRS (Functional Requirement Specification) - http://www.uic.org/IMG/pdf/EIRENE_FRS_v7.pdf

[9] SRS (System Requirement Specification) - http://www.uic.org/IMG/pdf/EIRENE_SRS_v15.pdf

then be implemented as specified in the EIRENE FRS and SRS. The EIRENE system includes terminals".

The requirement specification of the EIRENE system defines a radio system which aims to ensure voice and data communications of the operational, administrative and managerial personnel, within national and European boundaries.

> *"The EIRENE System Requirements Specification defines a radio system satisfying the mobile communications requirements of the European railways [EIRENE FRS]. It encompasses ground-train voice and data communications, together with the ground based mobile communications needs of trackside workers, station and depot staff and railway administrative and managerial personnel.*
>
> *...*
>
> *The application of this specification will ensure interoperability for trains and staff crossing national or other borders between systems. It also intends to provide manufacturing economies of scale wherever practical."*

In the scope of the examination and justification of the request, highlight should be given to the provision in Chapter 9 of this standard - Numbering Plan -, wherein it is referred that an EIRENE[10] network may be supported partially on fixed or mobile networks provided by public operators, leading to certain restrictions on the implementation of the EIRENE numbering plan. In order to bypass constraints and to achieve integration of the EIRENE numbering plan with the national public numbering plan (NNP), it is mentioned that numbers have to be allocated by the regulatory body.

3.2. Applicable regulation

According to paragraph 2b) of article 17 of the ECL, ANACOM is charged with "*Managing the National Numbering Plan according to the principles of transparency, efficiency, equality and non-discrimination, including the establishment of conditions for the allocation and use of national numbering resources*".

Paragraph 3[11] of article 17 lays down that "*the allocation of numbering resources to non-publicly available electronic communications services may be provided for, where it is deemed necessary and without prejudice to ensuring availability of numbering resources for publicly available services...*". Consistently, paragraph 2 of article 33 of the same law

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[10] The EIRENE network excludes terminals.

[11] Taking into account Statement of Rectification no. 32-A/2004, of 10 of April, published in
http://dre.pt/pdf1sdip/2004/04/085A01/00020002.pdf.

lays down that "*The rights of use for numbers may be granted to providers of electronic communication networks or services or to entities that use such networks or services*".

Therefore, the ECL comprises a framework for the allocation of rights of use for numbers to REFER TELECOM, for the operation of the GSM-R system in a private regime, similarly to the framework under which rights of use for frequencies were allocated, in the scope of the above-mentioned ICP - ANACOM's Determination of 06/08/2008, based on Decision ECC/DEC/(02)05.

The right of use for numbers is allocated by ICP - ANACOM further to the submission of a request including all necessary elements (article 35 of the ECL), the use of the referred rights being subject to compliance with conditions laid down in article 34 of the ECL.

Lastly, it should be taken into account that, according to article 23 of the ECL, providers of non-publicly available electronic communications networks and services may not be imposed restrictions that prevent them from negotiating "*agreements in respect of technical and commercial modalities of access and interconnection*" with other operators.

3.3. Numbering Plan

The NNP, which contains the national telecommunications plan managed by ICP - ANACOM, is defined in accordance with ITU-T Recommendation E.164[12]. It is defined in a user-friendly and informative manner so that access to electronic communications services may be achieved through different numbers according to the type of service. The NNP is thus structured according to numbering levels. Each level contains service codes which generally identify such services.

As rights of use for numbers are allocated by ICP - ANACOM in compliance with the principles and criteria for the management and allocation of NNP numbering resources published in http://www.anacom.pt/render.jsp?categoryId=5355, numbering resources must be compatible with the Activity Statement issued by ICP - ANACOM for the service to be provided by the requestor.

REFER TELECOM is authorized to operate the GSM-R system in Portugal, thus it is entitled to be provided with conditions that best ensure the fulfilment of requirements

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[12] The International Telecommunication Union – Telecommunication Standardization Sector - http://www.itu.int/ITU-T/index.html

defined in the EIRENE specification. This specification, as mentioned earlier, provides for the use of EIRENE numbers (private numbers of the system, both national and international) and of MSISDN[13] numbers (that is, E.164 numbers) in different numbering plans - an internal/EIRENE plan and a public/E.164 plan. It provides also for the allocation of E.164 numbers (MSISDN) to mobile stations in each GSM-R system network, establishing that the integration of these plans is facilitated in case subscribers' E.164 numbers are the same as EIRENE numbers (national numbers). For this reason, the use of E.164 numbers managed by the company itself will make it easier to establish a pattern for both types of numbers in the internal and public plan, thus supporting the number dialling regardless of the call origin, within or out of the GSM-R system network coverage.

As paragraph 3 of article 17 of the ECL lays down that "*the allocation of numbering resources to non-publicly available electronic communications services may be provided for, where it is deemed necessary*", it is acknowledged that the NNP is not provided currently with service codes intended exclusively for non-publicly available services. ICP - ANACOM is thus of the view that there is reason here to create a new code in the NNP intended for those services.

It is now necessary to define which NNP level is appropriate for the provision of non-publicly available electronic communications services.

The designation of services and respective codes in the NNP identifies the Voice Private Network Service in the "705" code. In fact, rights of use for "705" numbers are intended for bodies providing a commercial and public offer of private network electronic communications services, which is characterized by specific functionalities of these networks, using for the purpose the public network's infrastructure.

Given that service characteristics supported by the GSM-R system are somewhat similar to those of the Voice Private Network Service in the "705" code, it is deemed appropriate to use level 7 of the NNP for the new service, and to choose a number close to this service code. However, the differences between these services - private vs. public - and between networks supporting them - GSM system network vs. public switched telephone network - must be stressed. As mentioned earlier, the GSM-R system has a private

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[13] MSISDN Mobile Station International ISDN Number = CC + NDC + SN, where CC = Country Code; NDC = National Destination Code; SN = Subscriber Number.

operation scheme and aims to support non-publicly available electronic communications services only.

Therefore, as the ECL provided for the allocation of numbering resources to non-publicly available networks/services, ICP - ANACOM deems it appropriate to create a new code in range 7 of the NNP, weighting the choice of a free code in that level, close or next to the "705" code. Among alternatives in the NNP[14], it is deemed that the "703" code achieves this purpose.

Opening the "703" code for private network communications services will also enable national market business customers to be provided with numbers which may fulfil their own internal needs for a communications network.

The above gives rise to the definition of the characteristics and format of "703" numbers in the NNP as well as of the respective allocation and usage conditions.

It should be noted that, until now, rights of use of numbers of type E.164 in the NNP have been allocated to operators/providers, except for short numbers, in blocks of 10.000 numbers. However, in the case of business customers, networks may have a very variable extension or distribution, and thus user addressing needs/networks' terminal needs are very different. In these conditions, it is important to provide for the possibility of allocating blocks of numbers of a variable size. ICP - ANACOM takes the view that resources may be allocated in such a manner as to address 1000, 10000 or 100000 terminals or users, according to duly substantiated needs.

Consequently, a possible distribution allowing for the accommodation of the three network sizes would be:

- 5 private networks with an addressing capacity of 100000 terminals;
- 40 private networks with an addressing capacity of 10000 terminals;
- 100 private networks with an addressing capacity of 1000 terminals.

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[14] The 700, 701, 702, 703, 704 and 706 codes are free.

For this distribution, the network identification in the NNP would be as follows:

Service code (3 digits)	Private Network Identification (1, 2, 3 digits)	Network Terminal Identification (5, 4, 3 digits)
"703"	"1", "2", "3", "4", "5" (1 digit) "6x", "7x", "8x", "9x" (2 digits) "0xx" (3 digits)	xxx(x)(x)
Note: x integer number from 0 to 9		

On the other hand, as private networks are at stake, rules governing the public numbering plan, as far as the uniform length of numbers are concerned, do not have to be applied. As such, it is deemed desirable, on grounds of added flexibility, to allow the customer to choose a total length for numbers, between 9 and 12 digits. This would make the use of NNP numbers more efficient and thus decrease the application of number usage fees. At the internal level of the private network, numbers are not dialled with their full length, as both the service code and the private network code are not necessary.

Notwithstanding, it is acknowledged that the uncertainty on the full length of a NPP number may cause operational constraints as regards signalling when the called number has been fully dialled. In these circumstances, as it is not possible to define, *ab initio*, a number of sufficient sub-ranges in the "703" code that simultaneously meets four variable number lengths and three different sizes for resources to be allocated, either the flexibility is reduced by defining a set length for numbers, or it is sufficient for operators to associate the precise length of numbers with the identification of each private network according to the customers' choice, further to the allocation of rights of use for numbers by ICP - ANACOM.

On the conditions for use provided for in paragraph 1 of article 34 o the ECL, the terms for the condition mentioned in sub-paragraph f), on the type of fee for use (A, B, C or D) [15] to be applied to the use of those numbers, must be defined. ICP - ANACOM is of the opinion that these numbers are functionally equivalent to geographic numbers, thus tariff A should apply, corresponding currently to 0.02 Euros per number per year.

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[15] Defined in Annex III of Administrative Rule number 1473-B/2008, of 17 December - http://www.dre.pt/pdf1s/2008/12/24301/0000200014.pdf

It should be noted that some conditions defined in the mentioned paragraph 1 of article 34, such as portability, apply only to operators/providers of publicly available electronic communications services, and do not constitute requirements associated to rights of use for these numbers.

Lastly, Europe's situation as regards the distribution of a NNP E.164 code for the operation of GSM-R system must be referred. Data received from other regulators is condensed in a summary table presented in Annex 1 hereto, from which the following information may be highlighted:

- E.164 numbers were allocated to GSM-R systems of concessionaires' networks in 10 countries. In most countries, except for Italy and the Netherlands, numbers are intended to be used by private/business telephone services, closed user groups or non-publicly available networks;
- In the Netherlands, the NDC allocated to the GSM-R system is designated for personal number services for historical reasons, reason invoked by Sweden for the same situation. In Italy, the NDC falls on the range intended for mobile and personal communications services;
- Data was not made available for 4 countries.

In summary, given the request and its technical grounds on the basis of the EIRENE standard, given also the situation in other European countries and the NPP's numbering capacity to accommodate electronic communications services not yet provided for, it is deemed that the "703" service code should be created in the NNP, for the provision of electronic communications services on non-publicly available private networks.

4. Determination

Taking into consideration the above-mentioned grounds and those presented in the report of the prior hearing and general consultation procedures, the Management Board of ICP - ANACOM, in the scope of powers provided for in article 6, paragraph 1b) and m) of its Statutes, approved by Decree-Law number 309/2001, of 7 December, and under articles 17 b) and 34 of Law number 5/2004, of 10 February, hereby orders as follows:

1. The creation of the "703" code in the National Numbering Plan for the provision of electronic communication services on non-publicly available networks. Numbers take the following format:

   a. The total length of numbers varies between 9 and 12 digits according to the amount of terminals to be addressed and the company's option as far as the identification of the privative network is concerned;

   b. Three-field structure including, from left to right, the service code, the private network code and the network terminal code, with the following format:

Service code (3 digits)	Private Network Identification (1, 2, 3 digits)	Network Terminal Identification
"703"	"1", "2", "3", "4", "5" (1 digit)	(between 5 and 8 digits)
	"6x", "7x", "8x", "9x" (2 digits)	(between 4 and 7 digits)
	"0xx" (3 digits)	(between 3 and 6 digits)
Note: x integer number from 0 to 9		

2. The allocation of rights of use for numbers is governed by the following rules:

   a. The requestor must be a service user - the private network holder - authorized to operate the referred network according to provisions in the general regime of authorisation (article 21 of the ECL);

   b. Numbers are allocated according to the requestor's option and to duly substantiated numbering needs, on the basis of the network's full expected capacity;

   c. The allocation shall be published with the length set in each situation for numbers to be used by the requestor, according to the structure defined in 1b.

3. Companies to which rights of use for these numbers are allocated must observe the following conditions:

    a. To abide by the designation and service characteristics laid down in point 1, particularly ensuring that communications adopt the format option set for numbers the rights of use of which have been allocated;

    b. To comply with further generic obligations associated with rights of use for numbers, namely, the effective and efficient use of numbers and payment of fees, pursuant respectively to subparagraphs b) and f) of article 34 of Law number 5/2004, of 10 February.

ANNEX

Annex I – Situation of other European countries with GSM-R numbering resources

Country	Network holder	Date	MCC	MNC	NDC	Observations
Germany	DB Netz		262	10	1835	Referred to in the NNP as: 183 – Non geographic numbers - Closed User Group 11-digit length
Austria	OeBB	2007	232	91	50255	NDC=50255 (private networks) The GSM-R network may only be used in the rail network internal communications
Belgium	Infrabel		206	02	461	Referred to in the NNP – 4618 allocated to the company NMBS
Spain	ADIF	2004	214	51	888	No further information is available. Referred to in the NNP as: 888 - Orense geographic area
Slovakia	ŽSR		231	99	959	Non-public networks - GSM-R Forbidden international access The GSM-R operator will provide for a pilot. In the future – interconnection with fixed and mobile networks and other GSM-R system networks will be permitted.
Finland	RHK	2003	244	17	4556	Information not available
France	RFF	2004	208	14	6698	Information not available
Italy	RFI	2002	222	30	313	The NNP includes rules on GSM-R Included in mobile and personal communications services
The Netherlands	ProRail	2003	204	21	840	Code 8408 - Personal Number Service was allocated as in 2003 no other resource was available In 2006 range "088" was created (company numbers) however numbers continued to be used, thus range "84" was maintained
Norway	JBV	2003	242	20	879	Level 8 – non-geographic numbers Exclusively dedicated to the GSM-R system

United Kingdom	Network Rail		234	13	5555	**NNP description:** **055 – Corporate numbers** **Information could not be confirmed**
Czech Republic	SŽDC.		230	98	959	**959 – Private telephone networks** **9 Digits (1 million numbers)** **Roaming since 2007 with DB's GSM-R network (Germany)** **Interconnection with public fixed and mobile networks**
Sweden	BV		240	21	7838	**Referred to in the NNP as:** **Operator specific service - 15 Digits** **Information could not be confirmed**
Switzerland	SBB	2004	228	06	512	**Numbers in range 512 have been used for 25 years.** **NNP range 51 is intended for a Fixed Network Service (corporate networks).** **SBB declared that numbers were solely needed for its internal network.**