Consultation Paper
Creation of a Class Licence for Radio Frequency Identification Tag under Section 7B(2) of the Telecommunications Ordinance (Cap. 106)

7 December 2007

Introduction

Radio frequency identification ("RFID") refers to the technology that makes use of radio frequency transmission to identify people or objects automatically. As identified in the public consultation paper on Digital 21 Strategy[1] issued by the then Commercial, Industry and Technology Bureau last year, RFID is one of the advanced technologies that the Government would demonstrate its support by providing financial assistance for research and development and innovative work, and facilitate their wider applications.

2. In anticipation of rising interest and applications in RFID technology, the Telecommunications Authority ("TA") proposes allowing the use of RFID tags in the 433 MHz band by creating a class licence[2] for their use under section 7B(2) of the Telecommunications Ordinance (the "Ordinance"). This paper invites the views and comments from all interested parties on the TA's proposal.

RFID System

3. An RFID system is a low power radio system comprising RFID tags and interrogators. The RFID tag is intended for attachment to an item, which a user wishes to manage. It stores a tag ID number and

[1] Since 1998, the Government has set out its blueprint for the development of information and communications technology (ICT) in Hong Kong. In October 2006, the Government issued a paper to conduct public consultation on the 2007 Digital 21 Strategy. After considering public comment received during the consultation exercise, the Government will finalise the 2007 Digital 21 Strategy for announcement within 2007.

[2] Use of class licence is an administratively simple approach, whereby the users concerned are licensed without the need to undergo an application and processing procedure. It is an effective and efficient means to regulate the operation of radio devices with low interference potential.

other data regarding the tag or item and communicates this information to the interrogator. The interrogator, which is a radio device capable of communicating to tags within its radiofrequency communication range, controls the protocol, reads information from the tag, directs the tag to store data in some cases, and ensures message delivery and validity.

Standard for 433 MHz RFID System

4. The International Standard Organisation ("ISO") has specified various frequency bands for use by RFID technologies. These bands include 135 kHz, 13.56 MHz, 433 MHz, 860 – 960 MHz and 2.45 GHz. In Hong Kong, except the 433 MHz band, the Office of the Telecommunications Authority ("OFTA") has allocated frequencies in all these bands for RFID systems for public use on a licence-exempted basis under the Telecommunications (Telecommunications Apparatus)(Exemption from Licensing) Order. Electronic payment systems (e.g. Octopus card), electronic toll collection systems (e.g. Autotoll card), and Automatic Baggage Handling and Reconciliation System deployed at the Hong Kong International Airport are some examples of RFID system applications in Hong Kong.

5. In 2004, ISO and the International Electrotechnical Commission ("IEC") issued a specification ISO/IEC 18000-7[3], which governs the parameters for active air interface communications at 433 MHz. Specifically, the ISO-compliant RFID tag and interrogator shall operate at 433.92 MHz with a maximum occupied bandwidth of 500 kHz and shall emit an effective radiated power ("e.r.p.") not exceeding 2.2 mW.

Frequency Allocation and Licensing Requirements of 433 MHz RFID

6. In Europe, the use of 433 MHz short range RFID device[4] operating in the 433.05 – 434.79 MHz band is permitted without

[3] ISO/IEC 18000-7: Information Technology - Radio-frequency identification for item management, Part 7: Parameters for active air interface communications at 433 MHz.

[4] According to the European Commission Decision of 9 November 2006, the maximum e.r.p. of the short range device in 433.05 – 433.79 MHz is 10 mW with a duty cycle up to 10 %. Audio and voice signals in the band are excluded.

licensing requirement. In the US, the Federal Communications Commission ("FCC") permits the use of 433 MHz RFID systems[5] which are intended for containers tracking and limited primarily to industrial locations such as shipyards. Use of the RFID system is subject to registration with the FCC.

7. In Asia, the China State Radio Regulation Committee has granted type-approval certificate to a US-based company for its 433 MHz RFID device meeting the ISO/IEC 18000-7 standard. In other Asian economies including Korea, Singapore and Taiwan, ISO/IEC 18000-7 compliance RFID devices are being used at their seaports.

Benefits of Allowing the Use of RFID Tags in the 433 MHz Band

8. RFID has been widely recognized as the emerging technology capable of enhancing efficiencies for shipping port management and the logistics sector. The use of the 433 MHz band for RFID systems is in compliance with the international standard and in line with the government objective of facilitating the wider applications of advanced technologies.

Compatibility Issue

9. In Hong Kong, the 431 – 435 MHz band has been assigned for vehicle location services ("VLS"). The RFID tags may generate unwanted signals in a VLS mobile receiver in the immediate vicinity. However, such an occasion is extremely rare in considering the number of VLS mobile receivers and the nature of the RFID operation. Even interference occurs, the effect of which will be transient. In the light of the above considerations, VLS should not be adversely affected by the emissions from the RFID tag. Although there may be millions of RFID tags attached to items, these tags would not transmit until being triggered by their RFID interrogators. As such, RFID systems can be effectively regulated by licensing interrogators alone to achieve the objective of minimizing the potential interference to other radiocommunications

[5] Subject to the regulation of Part 15 of Title 47 of the Code of Federal Regulation.

systems.

10. RFID systems might be susceptible to interference caused by the VLS base stations or mobile stations operating in close proximity to these RFID systems. Nevertheless, the inherent collision arbitration mechanism of RFID systems is designed to overcome the problem of corrupted data caused by interference. In fact, in Europe, the Mainland and the US, the 433 MHz RFID operation shares the frequency band with other services.

11. Taking into account that the emissions from the RFID tags are unlikely to cause any harmful interference to other radiocommunications systems; use of the RFID systems can be effectively controlled or regulated by licensing the interrogators; and RFID systems can be equipped with advanced mechanisms to ensure their proper operation in the presence of other transmissions, the TA considers that the shared use of the 433 MHz band by RFID systems with the VLS is feasible.

The Proposal

12. A requirement for licensing individually the massive number of RFID tags used in Hong Kong will create unnecessary burden on and inconvenience to the users. Having considered the worldwide deployment of 433 RFID system and the spectrum compatibility issues, the TA proposes regulating the use of RFID tags in the 433 MHz band by creating a class licence under section 7B(2) of the Ordinance so as to facilitate their use in Hong Kong. While exemption order is used to cover the use of RFID applications in the 135 kHz, 13.56 MHz, 860 – 960 MHz and 2.45 GHz bands, the TA proposes to use class licence instead of the exemption order to cover the 433 MHz RFID tag. Since the introduction of class licence system in the amended Ordinance in 2000, it has been the intention of the TA to gradually replace the exemption order by the class licence system. The advantages of replacing the exemption order with class licence system are two-folds. Firstly, it allows the continual maintenance of a simple licensing arrangement. Secondly, it is more flexible for the TA to amend the existing conditions or adopt new conditions to meet the immediate need

of the industry. The class licence will be called "Class Licence for Radio Frequency Identification Tag" (the "Class Licence"). A draft of the Class Licence is given at Appendix 1.

13. It is important to note that the Class Licence will not cover the 433 MHz RFID interrogators. Use of these interrogators is still subject to individual licensing[6].

Technical Criteria

14. Based on the ISO/IEC 18000-7 standard, the TA proposes that the 433 MHz RFID tags covered by the Class Licence shall fully comply with the following technical criteria:

Frequency band : 433.92 MHz centered frequency
Maximum occupied bandwidth : 500 kHz
Power limit : 2.2 mW e.r.p.

Consultation with the Radio Spectrum Advisory Committee

15. The proposal of allowing RFID tags operating in the 433 MHz band to be used in Hong Kong was discussed at the 31st Meeting of Radio Spectrum Advisory Committee[7] ("RSAC") held on 16 May 2007. The proposal and the adoption of the technical criteria for 433 MHz RFID tag in paragraph 14 above, were unanimously supported by the RSAC members.

Specification and Type-approval

16. In addition to the technical criteria in paragraph 14, 433 MHz

[6] RFID interrogators will be licensed under the Radiodetermination and Conveyance of Commands, Status and Data Licence.

[7] Radio Spectrum Advisory Committee is an advisory committee set up by the TA to give advice on issues of spectrum management, allocations, assignments, procedural and policy matters. Its members include fixed and mobile network operators, satellite operators, academics, government departments, user groups and consumer body.

RFID tags shall conform to the technical specification prescribed under section 32D of the Ordinance. In consultation with the Telecommunications Standards Advisory Committee ("TSAC"), OFTA has prepared a technical specification HKTA 1051 entitled "Performance Specification for Radio Frequency Identification (RFID) Equipment Operating in the 433 MHz Band", which sets out the requirements for both the tags and interrogators. A draft of HKTA 1051 is given at Appendix 2.

17. Having considered that the RFID tags will emit a relatively low power level and such emissions are controlled through the licensing of RFID interrogators on an individual basis, the TA proposes that mandatory type approval need not be imposed on 433 MHz RFID tag. At present, OFTA operates the Hong Kong Telecommunications Equipment Evaluation and Certification Scheme. Under this scheme, suppliers or manufacturers of the 433 MHz RFID tags may apply on a voluntary basis for certification of equipment compliance with the relevant requirements stipulated in HKTA 1051.

Invitation of Views and Comments

18. The TA invites views and comments on his proposal set out in this consultation paper, the draft Class Licence at Appendix 1 and draft technical specification applicable to the RFID tag at Appendix 2. After considering the views and comments received, the TA will finalise details of the Class Licence for RFID tags and their technical specification.

19. All persons who wish to submit to the TA their views and comments on this consultation paper and its Appendices must do so on or before 4 January 2008. They should be aware that the TA may publish all or any part of the views and comments received and disclose the identity of the source in such manner as the TA sees fit. They should also clearly mark and draw to the TA's attention all parts of their submissions which they consider are commercially confidential. The TA will consider and decide whether or not to disclose such information. All submissions should be addressed to:

Office of the Telecommunications Authority
29/F, Wu Chung House
213 Queen's Road East
Wanchai
Hong Kong
Attention: Senior Telecommunications Engineer
(Spectrum Planning)
Fax: 2803 5112
Email: 433rfid@ofta.gov.hk

An electronic copy of the submission should be provided by email to the address indicated above.

Office of the Telecommunications Authority
7 December 2007

[DRAFT]

TELECOMMUNICATIONS ORDINANCE
(Chapter 106)

CLASS LICENCE

RADIO FREQUENCY IDENTIFICATION TAG

The Telecommunications Authority, in exercise of the powers conferred on him by sections 7(5) and 7B(2) of the Telecommunications Ordinance (Chapter 106), issues this Licence on this [ ] day of [, 2008]

1. Interpretation

1.1 In this Licence –

"Authority" means the Telecommunications Authority appointed under section 5 of the Ordinance;

"Interrogator" means a radio station which communicates to the RFID tag in its radiofrequency communication range;

"Licensee" means a person licensed under Condition 2 of this Licence;

"Ordinance" means Telecommunications Ordinance (Chapter 106);

"RFID" means "Radio Frequency Identification"

"Radio Frequency Identification tag" or "RFID tag" means a radio station falling within the description of the Schedule to this Licence; and

"Telecommunication Convention" means any Constitution and Convention of the International Telecommunication Union and

the Radio Regulations annexed thereto, which have from time to time or at any time been acceded to by or applied to Hong Kong.

1.2 Any word or expression used in this Licence shall, unless otherwise provided, have the same meaning as it has in the Ordinance or regulations made under the Ordinance.

1.3 For the purposes of interpreting this Licence, headings and titles shall be disregarded.

2. Grant of Licence

2.1 Subject to the terms and conditions of this Licence, a person is licensed to establish, maintain, possess and use the RFID tag described in the Schedule.

3. General

3.1 This Licence shall not be construed as granting an exclusive right to the Licensee.

3.2 This Licence replaces any licence or any exemption from licensing for the establishment, maintenance, possession and/or use of RFID tag, however described, which the Authority may have granted to the Licensee.

3.3 This Licence shall remain in full force unless expressly revoked by the Authority.

4. Compliance Generally

4.1 The Licensee shall comply with the Ordinance, regulations made under the Ordinance, licence conditions or any other instruments which may be issued by the Authority under the Ordinance and such guidelines or codes of practice which may be issued by the

Authority as in his opinion are suitable for the purpose of providing practical guidance on any particular aspect of any conditions of this Licence.

4.2 The Licensee shall observe and comply with all provisions of the Telecommunication Convention relevant to establishment, maintenance, possession and/or use of RFID tag.

4.3 The Licensee shall not use the RFID tag to provide a public telecommunications service.

4.4 The Licensee shall not use the RFID tag for voice communications.

4.5 The RFID tag shall not be used for transmission of radio signal except when under control of an Interrogator which is duly licensed on an individual basis under the Ordinance.

5. Interference

5.1 The Licensee shall take reasonable measures to establish, operate, maintain and use the RFID tag in such a way as not to cause any direct or indirect harmful interference with any lawful telecommunications service or any telecommunications apparatus licensed or authorised under the Ordinance.

5.2 The Authority may give such reasonable directions as he thinks fit to avoid any direct or indirect harmful interference referred to in Condition 5.1. The Licensee shall comply with the directions.

5.3 The Licensee shall make the RFID tag available for inspection and testing, if so required, by any person authorised for the purpose by the Authority.

5.4 The Licensee should be aware that the frequencies allocated to the RFID tag are shared with other applications in an

uncoordinated manner and therefore not protected from harmful interference caused by other telecommunications installations or radio equipment operating in accordance with the provisions of the Ordinance, or regulations or orders made under the Ordinance.

6. Technical Criteria

6.1 The Licensee shall ensure that they use at all times only RFID tags which fully comply with the technical criteria specified in the Schedule.

SCHEDULE

Radio Frequency Identification Tag

Radio Frequency Identification tag or RFID tag under this Licence refers to a radio station for providing data to an interrogator upon its request via a two way wireless link. RFID tag should comply with the technical specification HKTA 1051 issued by the Authority pursuant to section 32D of the Ordinance provided that it conforms to the technical criteria below:

Technical Criteria

Frequency band: 433.92 MHz centered frequency

Maximum occupied bandwidth: 500 kHz

Power limit: 2.2 mW effective radiated power

Appendix 2

HKTA 1051
ISSUE 1
September 2007
[Draft]

[DRAFT]

PERFORMANCE SPECIFICATION FOR

RADIO FREQUENCY IDENTIFICATION (RFID)

EQUIPMENT OPERATING IN THE

433 MHz BAND

TELECOMMUNICATIONS AUTHORITY
HONG KONG

FOREWORD

1. This specification is prescribed under section 32D of the Telecommunications Ordinance (Cap 106) ("the Ordinance") to set out the technical requirements for Radio Frequency Identification (RFID) equipment operating in the 433 MHz band in Hong Kong. Radiocommunications apparatus falling into the scope of this specification, unless covered by other application-specific specification, shall meet the stipulated requirements.

2. Under the Ordinance, the possession or use of any radiocommunications apparatus or any apparatus emitting radio frequency energy must be covered by an appropriate licence issued by the Telecommunications Authority (TA) with the exception of those specifically exempted from licensing under the Ordinance, such as those covered by the Telecommunications (Telecommunications Apparatus) (Exemption from Licensing) Order.

3. At present, the Office of the Telecommunications Authority (OFTA) operates a **H**ong **K**ong **T**elecommunications Equipment **E**valuation and **C**ertification (HKTEC) Scheme. Details of the HKTEC Scheme can be found in the information note OFTA I 421. Under the Scheme, suppliers or manufacturers of the radiocommunications apparatus may apply to OFTA for certification of their apparatus against this specification. The application procedures for certification of radiocommunications apparatus can be found in the information note OFTA I 401. A prescribed label may be affixed to the equipment which has been certified by the TA. Details of the labelling arrangement can be found in the Standardisation Guide HKTA 3211.

4. The TA reserves the right to give separate certification to models he considers to be technical variants and the performance of which may differ between models.

5. The TA may amend any part of this specification as and when he deems necessary.

6. In case of doubt about the interpretation of this specification, the methods of carrying out the test and the validity of statements made by the equipment manufacturers or suppliers about the equipment, the decision of the TA shall be final.

7. The HKTA specifications and information notes are issued by the TA. The documents can be obtained through one of the following methods :-

   - downloading direct through the OFTA's Internet Home Page. The Home Page address is http://www.ofta.gov.hk;
   - making a request for hard copies to :

     Radio Laboratory,
     Standards Section,
     Office of the Telecommunications Authority,
     29/F Wu Chung House,
     213 Queen's Road East, Wanchai, Hong Kong.

Fax : +852 2343 5824
Email : radiolab@ofta.gov.hk

8. Enquiries about this specification may be directed to —

Radio Laboratory,
Standards Section,
Office of the Telecommunications Authority,
29/F Wu Chung House,
213 Queen's Road East, Wanchai, Hong Kong.

Fax : +852 2343 5824
Email: radiolab@ofta.gov.hk

Appendix 2

CONTENTS

1 Scope of Specification

2 Electrical Safety

3 Radiation Protection

4 Operating Frequencies

5 Technical Requirements

1. SCOPE OF SPECIFICATION

This specification defines the minimum performance requirements for Radio Frequency Identification (RFID) equipment operating in the 433 MHz band.

2. ELECTRICAL SAFETY

The equipment shall comply with the electrical safety requirements set out in HKTA 2001 "Compliance Test Specification - Safety and Electrical Protection Requirements for Subscriber Equipment Connected to the Public Telecommunications Networks in Hong Kong" issued by the Telecommunications Authority (TA).

3. RADIATION PROTECTION

3.1 The RFID equipment shall comply with the exposure limits specified in:-

EN 50364 “Limitation of human exposure to electromagnetic fields from devices operating in the frequency range 0 Hz to 10 GHz, used in Electronic Article Surveillance (EAS), Radio Frequency Identification (RFID) and similar applications” issued by European Committee for Electrotechnical Standardization (CENELEC)

or

ANSI/IEEE C95.1 “IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz” issued by American National Standards Institute (ANSI) / Institute of Electrical and Electronics Engineers (IEEE)

or

“Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz)” issued by International Commission on Non-Ionizing Radiation Protection (ICNIRP)

3.2 Reference Test Method

To demonstrate the compliance with the exposure limits, assessment method should be made reference to:-

EN 50357 “Evaluation of human exposure to electromagnetic fields from devices used in Electronic Article Surveillance (EAS), Radio Frequency Identification (RFID) and similar applications” issued by European Committee for Electrotechnical Standardization (CENELEC)

or

ANSI/IEEE C95.3 “IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave” issued by American National Standards Institute (ANSI) / Institute of Electrical and Electronics Engineers (IEEE)

or

other measurement methods issued by relevant organisations which are acceptable to the TA.

4. OPERATING FREQUENCIES

The equipment shall operate at 433.92 MHz centered frequency.

5. TECHNICAL REQUIREMENTS

(a) Peak output level: 2.2 mW erp

(b) Spurious limits: 2.5 μW erp

(c) The 433 MHz RFID equipment shall meet the technical requirements of the standard below:

ISO/IEC 18000-7 “Information Technology – Radio frequency identification for item management - Part 7: Parameters for active air interface communications at 433 MHz”

(d) The test method for the 433 MHz RFID equipment shall meet the requirements of (i), (ii) or (iii) below:

(i) ISO/IEC TR 18047-7 “Information Technology – Radio frequency identification device conformance test methods – Part 7: Test methods for active air interface communications at 433 MHz”

(ii) ETSI EN 300 220-1 “Electromagnetic compatibility and Radio spectrum Matters (ERM);Short Range Devices (SRD);Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW;Part 1: Technical characteristics and test methods”

(iii) Code of Federal Regulations (USA); Title 47 Telecommunciation; Chapter 1 Federal Communications Commission, Part 15 Radio Frequency Devices; Section 15.231

- END -