中英文摘要精簡版

關鍵詞：符合性評估、市場稽查、標籤管理、通路管理、抽驗管理、矯正措施

一、 研究緣起

隨著通訊科技日新月異、無線通信應用蓬勃發展，通訊產業技術發展趨勢逐漸聚焦物聯網、感知學習、工業 4.0 與行動運算等，這些新興應用發展都將倚賴無線技術。國內在這波技術發展的洪流中已無法置身事外，對於新技術、新產品與新服務的開發也將呈現爆炸性的發展。由於無線技術射頻功能之電信管制射頻器材應在維持電波秩序及和諧共用等前提下使用，方能避免電波使用相互干擾，讓多元的無線通信應用技術能達最大使用效益。同時對於創新技術發展的產業趨勢，在電信管制射頻器材管理制度上亦應與時俱進，亦應有相對合理管理法規及配套措施，才能兼顧維持電波秩序及促進相關產業發展。爰此，國家通訊傳播委員會（以下簡稱通傳會）為進一步確保維持電波秩序及保障國民權益，秉持與時俱進檢討規管作為原則，藉由瞭解先進國家對電信管制射頻器材市場管理制度等相關規定及措施，據以檢討修正相關電信管制射頻器材管理法規，以期合理管理我國電信管制射頻器材，同時兼顧促進相關產業發展並與國際接軌。

二、 研究方法及過程

本研究依據各委託辦理工作項目，採用文獻分析法、個案研究法及比較分析法，並規劃專家座談會之舉辦，最終整合各研究方法與工

作項目的產出，提出適用我國現階段對電信管制射頻器材與國際接軌之合理市場管理法規及配套措施。相關研究方法分述如下：

(一) 文獻分析法

針對本研究涉及無線射頻器材管理議題，研究團隊需蒐集各國之政策、法規、市場與產業發展之相關資訊，以期對於研究議題有初步瞭解並有助於進行我國法制政策分析及座談會之舉辦，廣邀產官學研各界意見，最後綜整提出適用國內之合理市場管理法規及配套措施。

(二) 個案研究與比較分析法

由於電信管制射頻器材管理各國均有不同之需求發展，故需先行瞭解各國通訊產業以及其他領域重點產業狀況，將每個國家定義成個案，進行資料準備、蒐集及分析，並找出各指標的關聯性，並區別各國法制、市場環境與我國之異同，而後將前述所得之資料與我國現行法制以及修正中之法制架構進行綜合分析，並考量我國產業現況與基礎環境，將各國彙整後提出具體建議及因應措施，以擬定適用我國現階段電信管制射頻器材所需之法制修訂或革新之建議。

三、 重要發現

觀察各國主管機關人員總數及資源配置比例情形，其中以美國 FCC 每位員工對應約人口數 19.16 萬人最高，而新加坡 IMDA 每位員工對應 0.66 萬人口數最低；顯見新加坡 IMDA 監理人員配置相較於其他案例國家之電信管理資源較為充分。

在標籤授權他人使用方面，先進國家除澳洲外，未特別制訂「審驗合格標籤授權他人使用」規範，但多數國家允許設備驗證碼或證照的變更與轉讓（如美國、日本、韓國、新加坡、香港）；同時合規產

品投入市場前，也會先將產品責任方進行界定（如歐、美），要求責任方承擔產品符合性及標籤等權責義務，以確認相關法律責任歸屬。

在實體網路通路管理方面，案例國家針對無線電信設備和產品多要求進行符合性審驗或自我符合聲明，並在合規產品貼上標籤後，方能於實體或網路通路販售。部分國家貼黏標籤則屬自願性質，例如香港。但香港 OFCA 仍鼓勵獲驗證的設備貼上指定標籤，作為消費者指引；另美國對於採取 SDoC 授權的無線產品，可自願性的標記 FCC 標誌。但值得注意的是，業者產品若須貼黏 FCC 標誌，則該產品仍須經過測試、評估，並且完全符合 SDoC 程序要求的方能貼上 FCC 標誌。

澳洲、新加坡及香港等均未特別制訂自用及非商用設備進口規定，但強調使用非符合標準之無線電通信設備或擁有屬違法行為；而日本為因應 2020 年東京奧運會國外遊客連網需求，允許訪客入境日起 90 天內，可合法使用標示有美國 FCC 認證、歐盟 CE 標誌以及標示已取得 Wi-Fi Alliance 認證的 Wi-Fi 終端設備，或是標示取得 Bluetooth SIG 認證的藍牙終端設備。

在市場稽查執行方面，除日本鑑於稽查之迅速性和效率性委由民間機構辦理外，其他案例國家均由官方及驗證機構定期或不定期辦理。稽查的設備產品可能從市場直接購買或由責任方提供，測試查驗設備是否符合技術標準和認證標誌的適用性，包括設備是否取得驗證標籤、是否正確黏貼設備、是否符合技術規範等。另外，市場稽查機關也可要求進行工廠或營業場所檢查，例如澳洲、日本、新加坡及歐盟 MSA 等。

四、 主要建議事項

(一) 立即可行之建議

1. 檢討放寬低功率射頻器材管制項目，以加速產品上市促進產業發展。

   - 隨著科技進步各項射頻器材已成為民生物品；審酌現行低功率射頻器材，尚有甚多產品功率低於已開放低度管制的藍牙產品，可預見未來萬物聯網的時代，將有更多形形色色的低功率射頻器材上市，是否要以產品項目別為管制標的，值得進一步思考。美國為簡化設備驗證程序降低業者負擔，驗證方式已由四類簡化二類；日本鑑於極低功率無線設備(ELP)應用日漸廣泛且功率極低不易造成干擾，有條件開放 ELP 設備免驗免照販售使用。

   - 國內雖無類似日本開放「極低功率無線設備」使用機制，研究團隊建議可參酌國內開放六類藍牙功能產品經驗，持續檢討放寬低功率射頻器材管制項目，相關 ELP 設備經技術干擾風險評估後，採行 SDoC 方式辦理，以加速產品上市促進產業發展。

2. 適度強化監管密度，考量訂定審驗合格證明的使用效期，及適度管制「研發、測試或展示用不須電臺執照之電信管制射頻器材」

   - 參酌歐盟 RED 的 EU 類型檢驗證書效期由符合性驗證機構（NB）確定；韓國對於採符合性註冊制度（Registered Certification）授權產品標籤註冊效期為 5 年；新加坡屬 GER

和 SER 產品註冊記錄之有效期限為 5 年，供應商須在 5 年到期之前進行註冊更新。因此研究團隊建議主管機關可參考韓國與新加坡訂定標籤註冊效期，考量訂定審驗合格證明的使用效期，以促進電信管制射頻器材與時俱進，符合新規範要求。

- FCC 規定符合 47 CFR §2.1204 進口條件的射頻設備得進口美國使用；另用於測試和評估的進口數量為 4,000 件；用於工業貿易商展會展示的進口數量為 400 件。因國內對於(進口執照)供研發、測試或展示用不須電臺執照之電信管制射頻器材，無輸入數量限制措施。為避免干擾風險、廠商取巧或鼓勵長期合規的優良廠商，主管機關宜具適度管制射頻器材數量之必要。

3. 因應未來物聯網市場無線產品合規性，宜委託第三公正單位加強產品市場稽查。

- 隨著技術蓬勃發展，各類應用不斷推陳出新，如僅仰賴檢舉，實難有效管控干擾及違法設備。由於監理機關人力遠不足以因應數量龐大的審驗案件與稽查商品的狀況下，強化驗證機構後市場稽查義務，實為必然的選擇。

- 鑑於未來物聯網市場無線產品合規性要求，以及常態性市場稽查工作需足夠資源與設備，例如：查核對象及產品類別、資訊蒐集、市場檢查、樣品檢測等。因此，研究團隊建議主管機關可借鏡日本模式，委託國內具有知識能力的第三公正機關辦理市場稽查作業，以確保消費者健康與安全及市售無線產品的合規性。

(二)　中長期性建議

1. 逐步簡化審驗方式，以利國際接軌。

- 觀察美國為因應技術發展及市場趨勢，驗證制度由現行四種整合成二種類型(Certification、SDoC)，藉以簡化設備授權程序，減輕設備業者監理負擔。參酌美國立法例，我國或可考慮依使用頻率、功率大小、可能適用環境等因素，依風險別重新進行分類，以「逐部審驗的型式認證」、「簡化後的符合性聲明」及「自用審驗」三種方式進行規管。同時配合上開分類調整，本研究建議針對電信管制射頻器材審驗辦法，及低功率射頻電機技術規範進行修正與調整，建立一套完備的符合性評鑑程序。

2. 依據國內不同違規樣態及比例原則，補充細項裁罰準則。

- FCC 明定相關違規樣態裁罰金額規定，例如:違規進口、銷售未授權設備或造成干擾的基本罰金為 7,000 美元。違規使用未授權設備之基本罰金為 5,000 美元。未能保留必要文件記錄之基本罰金為 1,000 美元。同時，FCC 根據業者違規情節因素向上（如嚴重不當行為、故意違規、反覆或連續違規等）或向下（如輕度違規、過去有良好紀錄等）調整裁罰標準。另歐盟要求會員國應制定經濟營運商的處罰規則，包括對違反條例規定的嚴重違法行為的行政或刑事處罰。英國對於未經許可或違反許可條件的違規業者除將面臨最高刑罰三個月的監禁和/或無限額的罰款外，法院除可下令沒收設備庫存，並要求支付 Ofcom 的訴訟費用。

- 因此，研究團隊建議主管機關可參酌 FCC 裁罰制度，依據國內各種違規樣態，分類違規細項並依違規（害）程度設定不同裁罰金額，以求裁量更能符合公平性及比例原則。

Abstract

Keywords: conformity assessment, market surveillance, label management, channel management, sampling inspection management, corrective measure

I. Origin of Research

Along with the advancing communication technology and prosperous development of wireless communication applications, the development of communication industry has been gradually focused on IoT, perceptual learning, Industry 4.0, and mobile computing. The development of these emerging applications will rely on wireless technology. Taiwan has no choice but to embrace this trend of technology development, and there will be explosive development for new technologies, new products, and new services. The telecommunication regulatory radio frequency equipment should be used under the premises of maintaining wave order and harmonious sharing such that there will not be any interference, and the diversified wireless communication application technologies can achieve the maximum benefits. Meanwhile, the management system of telecommunication regulatory radio frequency equipment should be advancing in response to the industrial trend of innovative technology development, and there should be relatively reasonable management laws and regulations and supporting measures in order to take care of both maintenance of wave order and promotion of industrial development. In light of this, National Communications Commission (hereinafter referred to as NCC) will adhere to the principle of constant review and regulation in order to further ensure the maintenance of wave order and protection of rights and interests of our citizens. It will review and revise telecommunication regulatory radio frequency equipment and market

management system based on the understanding of rules and measures of telecommunication regulatory radio frequency equipment and market management system in advanced countries in order to reasonably manage telecommunication regulatory radio frequency equipment while promoting the development of relevant industry to be synchronized with international development.

II. Research Method and Process

In this study the literature analysis method, case study method, and comparative analysis method have been adopted according to each commissioned work, and expert symposiums have be organized. In the end the outputs of various research methods and works will be integrated to propose the reasonable market management laws and regulations and supporting measures suitable for telecommunication regulatory radio frequency equipment in Taiwan which can be synchronized with international development. The research methods are as described below:

i. Literature Analysis Method

As for the subjects of wireless radio frequency equipment involved in this study, the research team must collect information related to policies, laws and regulations, market, and industrial development for initial understanding of the research subjects and facilitating the analysis of laws and regulations and policies of our country and organization of symposiums for collecting opinions of industry/government/academia sectors. In the end the reasonable market management laws and regulations and supporting measures suitable for Taiwan can be summarized.

ii. Case Study Method and Comparative Analysis Method

There can be different requirements in different countries with respect to telecommunication regulatory radio frequency equipment. Thus the situations of communication industry and key industries of other fields in various countries must be investigated. Each country should be defined as an individual case for data preparation, collection, and analysis in order to figure out the correlation among all indicators. And the differences and similarities of laws and market environments of various countries with respect to Taiwan should be identified, and the comprehensive analysis should be conducted with respect to the aforementioned data and the existing regulatory system and the regulatory architecture being revised in our country. The current status and fundamental environment of industry in Taiwan should be taken into consideration, and the situations of various countries should be summarized in order to provide specific suggestions and responsive measures in order to formulate the law amendment or proposal for innovation required by telecommunication regulatory radio frequency equipment at current stage of our country.

III. Important Discoveries

We have observed the total number of staff of competent authorities and resources allocation ratios in various countries. The population corresponding to every employee of FCC in US is the highest at 191,600 people, while the population corresponding to every employee of IMDA in Singapore is the lowest at 6,600 people; this is an indication of more telecommunication management resources and supervising staff in IMDA of Singapore than other countries.

In terms of authorized use of label, except for Australia, most advanced countries did not formulate the regulation of “Review of Qualified Label

to be Authorized for Use by Others". However, most countries have permitted the change or transfer of equipment authentication code or license (such as US, Japan, Korea, Singapore, and Hong Kong); meanwhile, the product responsible parties will be defined before the qualified products are launched to the market (such as EU and US). The responsible parties will be required to bear the obligation of product conformance and labeling in order to confirm the legal responsibility.

In terms of management of physical network, most countries in the case have requested certification or SDoC compliance statement with respect to wireless telecommunication equipment and products, and the qualified products must be labeled before being sold in physical or online channels. In some countries the labeling is based on volunteering basis, such as Hong Kong. However, OFCA of Hong Kong still encourages the certified equipment to be labeled as a guidance for consumers; in addition, in US the wireless products based on SDoC authorization can be labeled by FCC mark voluntarily. It is worth noting that, the products still need to be tested and evaluated to be completely in compliance with the requirements of SDoC procedure before FCC mark can be labeled.

Australia, Singapore, and Hong Kong did not have any rule for self-contained and non-commercial equipment, yet it was emphasized that the use or ownership of wireless communication equipment not in compliance with the standard was illegal; in response to the networking demands of foreign tourists of 2020 Tokyo Olympics, Japan has allowed visitors to legally use Wi-Fi terminal equipment labeled with US FCC certificate, EU CE mark, and Wi-Fi Alliance certificate, or the Bluetooth terminal equipment labeled with Bluetooth SIG certificate within 90 days after entering Japan.

In terms of execution of market surveillance, except for Japan where it is organized by private institutions due to quickness and efficiency, in other countries in the case it is organized by government agencies and certification institutions regularly or irregularly. The equipment and products to be audited could be directly purchased from the market or provided by responsible parties in order to test whether or not the inspection equipment is in compliance with technical standard and certification mark (for example, if the equipment is granted the certification label? Is it correctly attached to the equipment? Is it in compliance with the technical specifications?). In addition, the market surveillance authority can also request for inspections of factory or business venue, such as Australia, Japan, Singapore, and EU MSA.

IV. Main Suggestions

i. Immediately Feasible Suggestions

1. Review of the liberalization of control items of low power radio frequency equipment in order to speed up the product launching and to promote industrial development.

    - Along with the technology advancement, various radio frequency equipment has become livelihood product; considering the power of most existing low power radio frequency equipment is lower than the Bluetooth equipment under low level control, we can foresee that there will be more and more low power radio frequency equipment being launched to the market in the future with Internet of Everything. So it is worth of further consideration that whether or not we want to set product item as the control target. For simplification of equipment verification procedure to reduce the burden of equipment vendors, in US the verification

approaches have been simplified from four types into two types; due to the growing popularity of application of ultra-low power (ELP) wireless equipment and the extremely low power which will not cause any interference, Japan has conditionally allow ELP equipment to be sold without the need for certificate and license.

- Even though in Taiwan there is not any mechanism of allowing "Ultra-Low Power Wireless Equipment" as in Japan, the research team has suggested that we can continue to review the liberalization of low power radio frequency equipment control items by referring to the experience of permitting six types of Bluetooth products in Taiwan. After risk assessment of technical interference, the ELP equipment can be subject to SDoC approach in order to accelerate the product launching and to promote the industrial development.

2. Proper enhancement of supervision density, consideration of determination of validation period of review qualification certificate, and proper control over "Telecommunication Regulator Radio Frequency Equipment for R&D, Test, or Exhibition Which Does Not Require Radio Station License".

- The EU type verification certificate of EU RED is confirmed by Notified Body (NB); in Korea the validation period of registration of product label of "Registered Certification" is five years; in Singapore the validation period of GER and SER product registration records is five years, so the supplier must renew the registration before this deadline. Therefore, the research team suggests that the competent authority use the validation periods of label registration in Korea and Singapore as the reference to determine the validation period of review qualification certificate

in order to keep the telecommunication regulatory radio frequency equipment updated and in compliance with requirements of new regulations.

- Based on FCC rule, the radio frequency equipment meeting the 47 CFR §2.1204 import conditions can be imported to US; the quantity of imported products for test and assessment is 4000 units; the quantity of imported products for Industry Trader Exhibition is 400 units. As for the telecommunication regulatory radio frequency equipment for R&D, test, or exhibition (with import license), there is not any import quantity limit in Taiwan. To avoid the risk of interference, vendor taking advantage, or to encourage outstanding vendors which have been qualified for a long period of time, the competent authority should apply proper control over the quantity of regulatory radio frequency equipment.

3. In response to the compliance of wireless products on future IoT market, a third party impartial unit should be commissioned to enhance the product market surveillance.

   - Along with the prosperous technology development, various new applications have been constantly introduced, and it can be difficult to effectively control the interfering and illegal equipment simply relying on reporting. Due to the insufficient manpower of supervisory agency to deal with the huge amount of review cases and merchandise audits, it is necessary to strengthen the verification institution for market surveillance obligation.
   - In light of compliance requirements of wireless products on future IoT market, and the fact that normal market surveillance will require sufficient resources and equipment such as surveillance

target and product variety, data collection, market inspection, and sample detection, the research team has suggested the competent authorities can learn from the model in Japan, which is to delegate third party impartial agency with knowledge capability in Taiwan to conduct market surveillance operation in order to protect the health and safety of consumers and to confirm the compliance of commercial wireless products.

ii. Mid-to-Long Term Suggestions

1. Gradual simplification of review approach to facilitate the synchronization with international development.

   - In US the verification system has been integrated from the four types into the two types (Certification and SDoC) in response to technology development and market trend in order to simplify equipment authorization procedure and to reduce the supervision burden of equipment vendors. Based on this example of legislation in US, we can consider the re-classification of risks according to factors such as frequency of use, power, and possible suitable environment. And the control can be conducted by the three approaches of “Type certification based on review by part”, “Simplified compliance statement”, and “Self-review”. In coordination with aforementioned classification adjustment, in this study it is suggested that a set of complete compliance evaluation procedure should be established for correction and adjustment of rules for review of telecommunication regulatory radio frequency equipment and low power radio frequency electrical engineering technology specifications.

2. Supplement of detailed penalty criteria according to different violation situations and principle of proportionality.

- The rule of penalty fines for respective violation situations has been specified in FCC. For example: the basic fine for illegal import, sales of unauthorized equipment, or causing interference is USD 7,000. The basic fine for the use of unauthorized equipment is USD 5,000. The basic fine for failure of keeping necessary document is USD 1,000. Meanwhile, FCC will enhance the penalty (such as severe misconduct, intentional violation, or repeated or continuous violations) or reduce the penalty (minor violation, or with good prior record) according to the situation of violation. In addition, EU has requested its members to formulate the penalty rules for economic operators, including administrative or criminal penalties for severe violation of regulations. In Britain, the vendors which violate the conditions of permission will face up to three months of imprisonment and/or fine without the upper limit, and the court is entitled to confiscate the equipment stock and request for payment of legal expenses of Ofcom.
- Therefore, the research team suggests that competent authorities can take FCC penalty system as a reference to classify the detailed rules of violations according to different violation situations in Taiwan and to set different amounts of fines according to the severity of violation such that the judgment can better meet the fairness and principle of proportionality.