

## **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 been 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.

1. 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.

2. 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.