

# Concept of a Secure and Safety Tracking System for Goods using QZSS and RF-ID

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## ABSTRACT

Recently, Globe will be smaller and smaller and each country will be dependable for one another at any field. Logistics of Goods like Industrial product, food and materials are easily exported and imported by every country.

A Secure and Safety Tracking System is indispensable for the viewpoints of Defense of country, especially the field of food secure and safety. If some accidents happened between countries by country, we need some objective criteria for the problem between different countries.

The application of Global Navigation Satellite System (GNSS) on a Secure and Safety Tracking System is considered. The conventional Tracking System has problems of uncertainty, uncleanness, un-certification of tracking route and the lack of authorized institutional certification and the lack of methodology.

The combination of QZSS (Quazi-Zenith Satellite System) and RF-ID is much suitable for The Secure and Safety Tracking System.

GNSS is global. The global is useful on the sphere of global, however, a Regional navigation satellite system (i.e. The Japanese QZSS) is sometimes more useful in localized area than a Global Navigation Satellite System. We will explain the process of how the food materials transfer from producer to consumer. Transportation tool (Ship or airplane) come into the QZSS Area. If GNSS receiver read PRN code of QZSS, PRN code with position and time is stored to certain memory area of RF-ID. GNSS receiver will update new (position + time) after certain interval (ie.30 minutes).

RF-ID (i.e. “ $\mu$ -Chip Hibiki”) is attached to target food materials. The benefit for RF-ID is stored information in inside “ $\mu$ -Chip Hibiki”. The user memory area is divided into 5 areas (max.) and these user memory areas can be protected by password (Read lock and write lock) and addition to that, each password (max.5) can protect for each area (max.5). The size of user area inside “ $\mu$ -Chip Hibiki” is 1.5Kbits and can be re-writable. The points of

combination of QZSS and “ $\mu$ -Chip Hibiki” are to trace logging information by position and time stamp. QZSS receiver achieves the monitor of position and time stamp. This QZSS receiver is consist of RF-ID reader and writer with GNSS&QZSS receiver.

We propose Basic concepts how to realize the Secure and Safety Tracking System (special for food, food material) between different countries. The conclusions are as follows; (1) we make clear the certainness of tracking route from producer to consumer through logistic and value added re-seller over country to country. (2) We make the cleanness of tracking route from export country to import country and the checkpoints as immigration, Customs, means of transportations. (3) We make the certification of tracking route and the satisfaction of authorized agency certification.