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Hitachi Kokusai Electric Inc.
Universiti Teknologi Malaysia
Malaysia Airport Holding Berhad

Launch of Field Trial Experiment of High-Precision Foreign Object Debris Detection System for Runway in KLIA

Hitachi Kokusai Electric Co., Ltd. (HiKE), Malaysia Airport Holding Berhad (MAHB-operator of KLIA) and Universiti Teknologi Malaysia (UTM) jointly launch the operation of high-precision foreign object debris detection system (FODDS) for Kuala Lumpur International Airport (KLIA). The launching ceremony will officiate by Deputy Minister of Transport Malaysia and Vice-Minister Internal Affairs and Communication Japan witness by government officials from both countries at Kuala Lumpur International Airport, Malaysia.

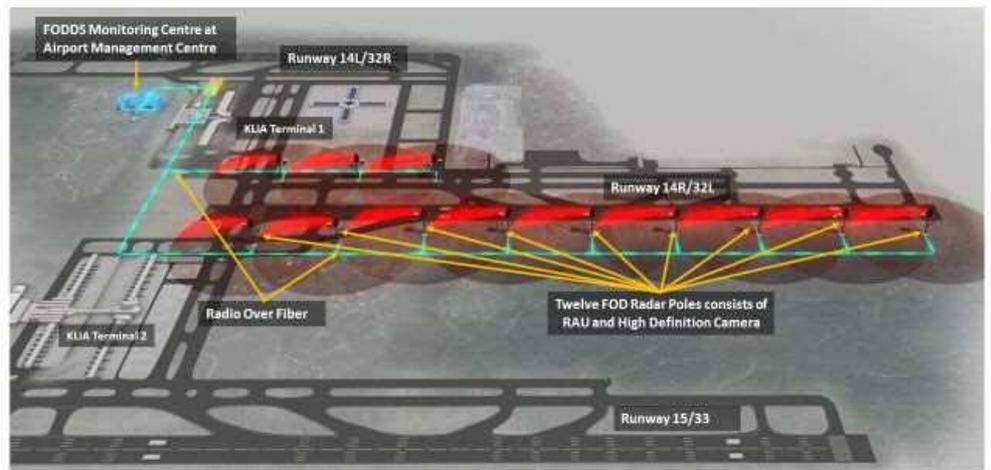


Photo: (Left) One of the Radar pole constructed at KLIA and (Left) Illustration of the FODDS at KLIA.

The tripartite collaborative project is part of an initiative of the Ministry of Internal Affairs and Communications Japan under the industrial program led by Hitachi Kokusai Electric and few Japan's research organization, where the title of the

program is “Contract for research on promotion of international coordinated use of frequency through overseas development of linear cell radar system (runway surface foreign object detection system)”. The framework of the technical cooperation was developed to embrace the advanced aviation technology in testing the effectiveness of radio over fiber radar system through an international academic cooperation between National Institute of Information and Communications Technology, Waseda University, and Universiti Teknologi Malaysia, seven years ago, which later extended under industrial project collaboration with Hitachi Kokusai Electric, the system manufacturer’s and Malaysia Airport Holding, the KLIA operator.

On top of that, significant international technology transfer activity was established via industry-government-academia collaboration between Japan and Malaysia. One of the key objectives in project are to promote exchanges knowledge including human capacity development and to enhanced linear cell radar technology by conducting field trial in actual airport operation which later Malaysia and Japan will recommended the outcome to international standardization organizations such as International Telecommunication Union Radiocommunication sector (ITU-R), the International Electrotechnical Commission (IEC) and the International Civil Aviation Organization (ICAO).

FOD is defined as, “*Any object located in an inappropriate location in the airport environment that has the capacity to injure airport or airline personnel and damage aircraft*”, which can cause damage to aircraft as well as injury airport employees. FOD incurred the global aviation industry \$1.26 billion annually in direct costs, and \$13.9 billion annually in indirect costs (e.g., flight delays, runway closure). Hence, new technologies for FOD detection system is developed to continuously inspect and detect FOD.

The FODDS system construction and installation at KLIA was begins with preliminary experiment and system infrastructure design since February last year. First field trial experiment was performed in the UTM campus and KLIA apron to show availability of small FOD detection and provide sensitivity on the antenna

height in the airport surface situation. The demonstration unit consists of 96GHz radar system supported with high resolution cameras to ensure high quality images of the detected FOD to be identified. It also enables real-time data collection thus expediting the investigation process in identifying FOD sources and facilitating fast runway clearing process.

The advantages of the system include its low operational cost, low emission of radio waves, and most importantly a highly scalable system for busy airports. Through more than a year field trial at Narita International Airport, the system demonstrated highly accurate and fast, the system is able to detect 3cm FOD within the range of 500 meters in 10 seconds by using the millimeter wave radar over optical fiber technology. The FOD detection systems is able to spot FOD the moment it is deposited on the runway by radar sensing, identifying, and locating at a previously unprecedented level of speed and accuracy for objects as small as an aircraft rivet. This is extremely valuable when aircraft takeoffs are only minutes apart. Finally improved airport management by not only increases efficiency, enhances safety and improves security, but also saves airports and airlines countless hours in time, money, and manpower.

The field trial experiment facility in Kuala Lumpur International Airport will be world focal point and model case in Asia Pacific where aviation demands are high and airport construction plans well demanding. This FODDS will be a promising candidate to enhance security against intruders or attack drones in important facilities and to enhance safety to avoid critical incident in the airport runways.

* This news release of “ Linear Cell Radar System” is part of the outcome of “R&D of high-precision imaging technology using 90GHz-band linear cells” and ““R&D of coordinated linear cell radar system in 90GHz-band” ” sponsored by Ministry of Internal Affairs and Communications, Japan, 2013-2015, 2017-2020 respectively.

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