

FOR IMMEDIATE RELEASE

**Electronic Navigation Research Institute (ENRI), Japan,
selects Hitachi as a testbed system equipment vendor
for its first airport surface mobile communication system
(AeroMACS) trial in Asia**

Tokyo, February 12, 2014 – Hitachi, Ltd. (TSE : 6501 “Hitachi”) today announced it was selected as a testbed system equipment vendor by Electronic Navigation Research Institute (Independent Administrative Institution : “ENRI”) through a tender for AeroMACS^{*1} prototype development. This award recognizes Hitachi’s significant experience and technological capability that is demonstrated by commercial deployments of nation-wide and highly stable mobile broadband networks throughout Asia.

The testbed system is planned to be installed at Iwanuma Branch, ENRI branch laboratory, adjacent to Sendai International Airport and used for the first AeroMACS field test in Asia.

Associated with global growth of air traffic density these days, air traffic communication, in particular around airports has become heavily congested, and limited network bandwidth is a global concern today. AeroMACS, based on ICAO^{*2} recommendation, is expected to be a technology solution to provide airport areas with next generation airport surface mobile broadband networks. International standardization to cover all the airports world-wide has been discussed for several years, and a number of R&D programs for actual deployment have been conducted. ENRI is one of the international leaders and contributors to develop AeroMACS standards and conduct R&D for its proto-typing and technology evaluation.

AeroMACS uses OFDMA^{*3} signal processing based on the WiMAX^{*4} technology standard, with ICAO’s recommendation for its use for next generation airport surface mobile communication systems. AeroMACS seamlessly covers the entire airport surface and all the facilities on it, and it can provide airport operators, airlines, pilots and air traffic controllers with a mobile broadband service. With AeroMACS, next generation airport services and enhanced air traffic control procedures on an airport surface will continue to assure safe, secure and efficient air traffic service and airport operation.

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Hitachi's AeroMACS system fully complies with AeroMACS standards, offers a choice of MIMO Matrix-A and MIMO Matrix-B^{*5}, and implements enhanced QoS^{*6} features to provide high through-put^{*7} and secure network operations. In order to achieve a multi-km coverage radius with high-speed stable data transmission, the system implements a centralized base-station monitor, a gate-way to handover any data from airplanes and vehicles moving on an airport surface, and a security function to authenticate all devices connected to the AeroMACS network.

Hitachi is a principal member of WiMAX Forum^{*8} and serves on the Forum's Board of Directors. Through the Forum, as a technical liaison, Hitachi has been contributing to ICAO, RTCA^{*9} and EUROCAE^{*10} to develop international AeroMACS standards to support their plans to deploy next generation airport infrastructures.

Hitachi will continue to be an active participant in international standardization and promotion and further contribute to building global next generation civil aviation infrastructures, in particular communication networks, through technology and solution development.

- *1 AeroMACS(Aeronautical Mobile Airport Communication System): Wireless broadband mobile access networks based on WiMAX technology standard for next generation airport surface communications
- *2 ICAO(International Civil Aviation Organization): A specialized agency of the United Nations to promote the safe and orderly development of international civil aviation throughout the world
- *3 OFDMA(Orthogonal Frequency-Division Multiple Access): A large number of closely spaced orthogonal sub-carrier signals are used to carry data on several parallel data streams or channels to achieve broadband mobile bandwidth. WiMAX & LTE use this technology
- *4 WiMAX (Worldwide Interoperability for Microwave Access): Interoperable broadband wireless technology based upon IEEE Standard 802.16
- *5 MIMO (Multiple Input Multiple Output) Matrix-A/-B: One of radio transmission scheme to use of multiple antennas at both the transmitter and receiver to improve communication performance
 - Matrix-A: Space Time Coding (STC) to recover a data stream by correlating a diversity gain
 - Matrix-B: Spatial Multiplexing (SM) – multiple encoded data streams are transmitted at the same time within a same channel but on different transmit antenna (multiplexed on space dimension) to improve data transmission rate
- *6 QoS: Quality of Service
- *7 Through-put: A sum of data rates delivered to all terminals in a network, measured in bits per second
- *8 WiMAX Forum: A non profit organization formed to promote the adoption of WiMAX compatible products and services
- *9 RTCA(Radio Technical Commission for Aeronautics): Known as RTCA, but today RTCA Inc., a US volunteer organization that develops technical guidance for use by government regulatory authorities and by industry under FAA
- *10 EUROCAE(the European Organization for Civil Aviation Equipment): A non-profit organization whose membership exclusively comprises aviation stakeholders made up of manufacturers, services providers, national and international aviation authorities and users from Europe and elsewhere

About Airport Surface Communication Network Concept



*11 Cell: Radio area to be completely covered by one base station

*12 BS-OMC(BaseStation Operation and Maintenance Center) : Operation & monitor console for radio base stations

*13 AAA(Authentication, Authorization, and Accounting) : Frame in the architecture to set three different security capability by 'AAA'

*14 HA(Home Agent) : Software or device to realize a roaming to use for a mobile WiMAX technique

*15 ASW-GW(Access Service Network-GateWay) : Gateway device which I realize the hand over of the terminal to use for a mobile WiMAX technique, and performs the connection with the outside network

About Independent Administrative Institution, Electronic Navigation Research Institute (ENRI)

ENRI is the only institute in Japan conducting research relating to air traffic systems consisting of Air Traffic Management, Communication, Navigation and Surveillance technologies and is now involved in research and development to realize air traffic increase, traffic safety enhancement and global environmental preservation. Since 2011, ENRI has been focusing on three intensive R&D themes: (1) Advanced in-flight operation, (2) Advanced flights near airports, and (3) Technology and safety

connecting the sky and ground for the purpose of safe and efficient flight operations in order to contribute to next generation advanced air traffic management in Asia as well as Japan.

For more Information on ENRI, please visit the organization's website at http://www.enri.go.jp/eng/index_e.htm

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About Hitachi, Ltd.

Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, is a leading global electronics company with approximately 326,000 employees worldwide. The company's consolidated revenues for fiscal 2012 (ended March 31, 2013) totaled 9,041 billion yen (\$96.1 billion). Hitachi is focusing more than ever on the Social Innovation Business, which includes infrastructure systems, information & telecommunication systems, power systems, construction machinery, high functional material & components, automotive systems and others.

For more information on Hitachi, please visit the company's website at <http://www.hitachi.com>.

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Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
