Email This Letter

08 June 2006

Chuck Adams
IBM
North Castle Drive
Armonk, NY 10504
wcadams@us.ibm.com

Re: P1902.1 - Standard for Long Wavelength Wireless Network Protocol

Dear Chuck:

I am pleased to inform you that on 08 June 2006 the IEEE-SA Standards Board approved the above referenced project until 31 December 2010. A copy of the file can be found on our website at http://standards.ieee.org/board/nes/projects/1902-1.pdf.

Now that your project has been approved, please forward a roster of participants involved in the development of this project. This request is in accordance with the IEEE-SA Operations Manual, Clause 5.1.2i under Duties of the Sponsor which states:

"Submit annually to the IEEE Standards Department an electronic roster of individuals participating on standards projects"

For your convenience, an Excel spreadsheet for your use has been posted on our website at http://standards.ieee.org/guides/par/roster.xls. Please forward this list to me via e-mail at s.hampton@ieee.org no later than 06 September 2006.

Please visit our website, IEEE Standards Development Online (http://standards.ieee.org/resources/development/index.html), for tools, forms and training to assist you in the standards development process. Also, we strongly recommend that a copy of your draft be sent to this office for review prior to the final vote by the working group to allow for a quick review by editorial staff before sponsor balloting begins.

If you should have any further questions, please contact me at +1 732 562 6003 or by email at s.hampton@ieee.org.

Sincerely,

Sherry Hampton
Administrator, Governance
Standards Activities
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CC: john@visible-assets.com

PAR Request Date: 16 February 2006

PAR Approval Date: 08 June 2006

PAR Signature Page on File: Yes

Type of Project: New IEEE Standard

Status: PAR for a New IEEE Standard

Root Project/PAR:

1.1 Project No.: **P1902.1**

1.2 Type of Document: Standard

1.3 Life Cycle: Full-Use

1.4 Is this document in ballot now? No

2.1 Title
Standard for Long Wavelength Wireless Network Protocol

2.1 Amendment/Corrigenda Title

3.1 Working Group Name	RuBee Working Group
Working Group Chair	Stevens John Phone: +1 603 418 8721 Email: john@visible-assets.com
Working Group Vice Chair	
3.2 Sponsor	IEEE-SA Board of Governors Corporate Advisory Group (BOG/CAG)
Sponsor Chair	Adams Chuck Phone: 914-765-4382 Email: wcadams@us.ibm.com
3.3 Joint Sponsor	IEEE Communications Society Standards Committee (COM/SC) Gelman D Alexander Phone: 609-734-7345 Email: adg@ieee.org

4.1 Type of Ballot: Entity

4.2 Expected Date of Submission for Initial Sponsor Ballot: 2006-12-00

4.3 Projected Completion Date for Submittal to RevCom: 2007-10-00

5.1 Approximate number of people expected to work on this project: 15

5.2 Scope: The project will develop a physical layer and data link layer protocol standard for long wavelength (< 450Khz), low speed (300-9600 Baud), low power, medium range (50' to 100') industrial visibility networks. It will fill a gap between non-network-based RF-ID standards (e.g., ISO/IEC CD 15961-3, ISO 18000-6C or 7) and existing high bandwidth network standards such as IEEE 802.11 a,b,g and IEEE 802.15.4 e.

5.3 Is the completion of this document contingent upon the completion of another document? No

5.4 Purpose: The purpose of this project is to produce a protocol standard for use in applications where bandwidth is not an issue; but low cost, high tag (client) count, long battery life and use in harsh environments (near steel and water) are key performance criteria. Example applications include visibility of medical devices in hospitals, patient and physician visibility in OR's, product visibility in retail stores, and livestock visibility. Many cost-sensitive, power "limited" applications exist (e.g., most industrial visibility networks) that may not require high bandwidth, yet do require real-time, peer-to-peer networking with extended battery life. The purpose of the proposed standard will be to provide a definition for full physical interoperability for all components (chips, tags, routers, and handhelds) within a long-wavelength network. Asset tracking systems provide asset history. Tracking is based on portal or beacon readers that read a barcode or RF-ID tag as it passes though a location (door or on conveyor). A "Visibility Network" provides tracking data, but also provides real-time, interactive asset status. A Visibility Network is a real-time on-demand, local area network, so real-time sensor alerts are possible (e.g. temperature, jog, flow), real-time asset location (e. g. asset is on the shelf now or in use in the operating room), real-time asset status (e.g. the box is unopened), and real-time pair-wise linking (the patient and the blood type match) is possible. A Visibility Network may also be interactive in that it can operate efectors (e.g. open locks; flash LED's for pick and place; or display information on an LCD display). Thus, asset tracking provides history (pedigree where asset has been). Visibility Networks provide asset tracking, but also provide real-time, interactive, local area network status of an asset (pedigree and where it is now).

5.5 Need for the Project: This proposed project will enable a standard for low speed, low cost sensor and visibility networks in harsh environments, with battery/power source lives of over 10 years. The standard is necessary so a variety of manufactures can manufacture devices that can reliably work together in the field. Current RF-ID tags use a non-radiating, back-scattered communications mode. This has the advantage of eliminating the battery, crystal and other external components, so tags are low cost, but often require a high cost (> $1,000) base station and with no tag networking capabilities. In contrast, IEEE 802.11 uses a radiating transceiver mode and lower cost routers (< $100.00) and base stations. IEEE 802.11 "tags" or clients may have near-unlimited memory with flexible IP addresses and modest cost ($10-$30). However, power requirements for high frequencies used by IEEE 802.11, lead to short battery lives (days/months). Additionally, IEEE 802.11 was designed for managing high bandwidth, high volume data from a relatively few clients. The IEEE 802.11 protocol is not optimal for low bandwidth visibility networks. Many visibility networks require 1000's to 10,000's of IP addresses (tags) within a small network (e.g. shelf of products), but have low data volume, low bandwidth requirements, require long battery life (years). IEEE 802.11 performance often becomes unacceptable as tag count increases within a network. 802.15.4 e has an improved battery life but still limited to a few months and similar client/tag count networking issues. Some 802.15.4 e devices may consume less than 8 milliamps, while most IEEE 802.11 systems are in 100's of milliamps. Finally, both IEEE 802.11 and 802.15.4 e make use of frequencies over one gigahertz, which cannot perform near liquids and fail near steel. The use of spread spectrum has improved harsh environment performance, though it remains a serious issue and limitation for use in harsh environment industrial visibility networks. New long-wavelength (LW under 450Khz) power efficient designs have made it possible to create active transceivers that function like 802.15.4 e and IEEE 802.11, with IP addresses and peer-to-peer, on-demand, communications, with an acceptable range to work as a local network. These LW tags are slow compared to other standards (300-9600 baud), but have a field-proven 10-year or longer battery life using a quarter-sized CR2525 Li battery. Current LW systems use a protocol known as RuBee IV, and consume only a few microamps in standby and less than 1 milliamp in active mode. RuBee tags may be fully programmable using low cost 4-bit processors capable of encryption and decryption and complex functions associated with managing IP addresses (DCHP, ARP). LW systems, offer the advantage of low cost tags and low cost base stations (< $100). Moreover, because LW tags have a power source, they may optionally be equipped with sensors, sRAM, displays, LEDs and may also be low in cost (< $2 per tag). Some Rubee protocol designs also eliminate the battery and cost about 15 cents with a reduced range. Networks of thousands of peer-to-peer LW tags work reliably as a visibility network.. LW tags are not affected by liquids, can be used underwater or as an implantable device, and are minimally affected by steel. LW industrial visibility networks may be used to provide visibility on or near steel shelves and in harsh environments such as operating theaters (rooms), oil and chemical plants, warehouses and retail stores. Long wavelength, low bandwidth visibility systems and sensor networks are currently in use at industrial installations. Pilot systems are installed in several major retailers as in-store inventory visibility systems, in hospitals to provide medical device visibility, other healthcare applications providing real-time inventory visibility of high valued products throughout distribution, in agriculture applications providing visibility and age verification for cattle, and in other industries providing identity systems and visibility systems for patients, physicians, policemen, firemen, correctional officers and corporate employees. In summary, even though these systems will operate at low bandwidth, those bit rates are sufficient for many useful applications.. They have the advantage of low cost clients, low cost base stations and routers, a long battery life tags, high client/tag counts within a single network, and work in harsh environments (near steel and water). Long wavelength protocols will not work for network computer applications, but do have a nitch use in industrial, agriculture and healthcare, visibility networks. The long-term potential of industrial long wavelength visibility networks using this technology is potentially large, but also new and unexplored. A well thought-out IEEE standard will be essential to facilitate the growth of this commercial market.

5.6 Stakeholders for the Standard: The stakeholders include the healthcare industry, government law enforcement agencies, livestock industry, retailers, industrial manufacturers and RuBee Equipment Systems manufacturers.

6.1.a. Has the IEEE-SA policy on intellectual property been presented to those responsible for preparing/submitting this PAR prior to the PAR submittal to the IEEE-SA Standards Board? No **Presented Date:** 2006-07-17
If no, please explain: The policy will be presented formally to the Working Group at their first meeting.

6.1.b. Is the Sponsor aware of any copyright permissions needed for this project? Yes
If yes, please explain: This document is based on a specification from Visible Assets who will provide required LOA.

6.1.c. Is the Sponsor aware of possible registration activity related to this project? No
If yes, please explain:

7.1 Are there other standards or projects with a similar scope? No
If yes, please explain:

Sponsor Organization:
Project/Standard Number:
Project/Standard Date: 0000-00-00
Project/Standard Title:

7.2 Is there potential for this standard (in part or in whole) to be adopted by another national, regional, or international organization? ? Do not know at this time
Technical Committee Name and Number:
Contact person:
Contact person Phone Number:
Contact person Email Address:

7.3 Will this project result in any health, safety, security, or environmental guidance that affects or applies to human health or safety? No

7.4 Additional Explanatory Notes:

8.1 Sponsor Information:
Is the Scope of this project within the approved scope/definition of the Sponsor's Charter? Yes
If no, please explain: