Convenor: Goh Hock Nguan, Singapore

REPORT

18th meeting of ISO TC 104/SC 4/WG 2

2005-10-18 and 2005-10-19

Nagoya, Japan

Any comments on this report are to be sent to the WG Secretary before 2005-12-19

All presentations held during the meeting can be downloaded from
http://www.autoid.org/tc104_sc4_wg2.htm

List of participants

Convenor: Goh Hock Nguan, Singapore
Secretary: Barbara Bok, Singapore

Members:

Denmark	Lars W. Lorenzen Jorn Heerulff Lars Kjaer
Germany	Frank Nachbar Jens Lauk
Israel	Micha Auerbach Eli Levy
Japan	Akira Shibata
Korea	Yoon Seok Chang Seong Nak Seon Suk Woo Choi
The Netherlands	Simon Spoormaker
United States of America	Andrew B. McNeice William Ferguson Fraser Jennings George Cavage Dick Schnacke Tim Harrington Craig Harmon Joe Burnam Dan Kimball Todd Drake Julia Zhu
Observers:	Catherine Chow, China Ho Tung Chuen, China Daniel K.W. Li, China Sharon Wei, China Gloria Lo, China Alice Ho, China Nike Ni, China Kunihiro Yokoyama, Japan Tetsuya Hamabe, Japan Akihiko Saitou, Japan Shinji Hayase, Japan Shin-ichi Ishii, Japan Hiroshi Imai, Japan

Chang-Boo Seok, Korea
You Sung Kang, Korea
KyungEun Lim, Korea
Hai Jin Chong, Korea
Ho Su Jeong, Korea
Yunju Baek, Korea

Chan Chee Keong, Malaysia

Mr Ed de Gelder, The Netherlands

Christopher Yerkes, United States of America
Jürgen Reinold, United States of America
Michael Wolfe, United States of America
Phil Behenna, United States of America
Walter Dixon, United States of America
Robert Knetl, United States of America
John Rosen, United States of America

Michael C. Rayner, United Kingdom

Agenda item #1: OPENING ORDERS

I Call to order, introductions and opening remarks

1. The meeting was called to order at 0930 by ISO TC 104/SC 4/WG 2 Convenor, Mr Goh Hock Nguan. He greeted everyone and thanked the hosts, Japan Automatic Identification Systems Association, Mr Akira Shibata, Mr Hiroshi Imai and Ms Akihiko Saito for their excellent organisation and generous hospitality. Kudos were extended to Mr Craig Harmon for his kind effort in coordinating meeting location.

2. The Convenor on behalf of the host provided general information on meeting logistics.

3. Attendance at this meeting reached upwards of 53 participants (24 members and 29 observers). At the invitation of the Convenor, all persons present at the meeting introduced themselves with summary of affiliations and expertise.

4. The Convenor suggested the following basic ground rules which were agreed upon by the whole team:

   a) One person speaks at a time (members who want to speak will raise their hands and be called on by the Convenor).

   b) Observer may only speak on the invitation of the Convenor.

5. A call was issued for disclosure of the existence of any known patent or to any known pending patent application (either their own or of other organisations). It is necessary for the patent holders to agree to license those patents in conformance with the ISO patent policy if the project on which they apply is to proceed.

II Appointment of resolution drafting committee

6. Mr Dick Schnacke and Mr Todd Drake were appointed.

III Adoption of the revised agenda

7. The Convenor presented the draft agenda for this meeting and highlighted the inclusion of an additional item entitled “Presentation of ePP (eSeal Protection Protocol) for ISO 18185-4” in accepting Korea’s request.

8. Mr Dick Schnacke proposed the following modification to the agenda and with this addition, the revised agenda was agreed.

   Revision to the agenda:
   Add new agenda Item 5 “SWG update on action items” and renumber the remaining items accordingly.

IV Composition and current membership

9. 3 new members were introduced and welcomed to the working group:

   a) Mr Joe Burnam (USA)
   b) Mr Tim Harrington (USA)
   c) Ms Simone Hilkens (Denmark)

10. The Convenor reported that the ISO TC 104/SC 4/WG 2 membership had grown to 44 members (the latest membership list was circulated at the meeting). For the benefit of the uninformed, he highlighted that the experts were registered as members of ISO TC 104/SC 4/WG 2 through official nomination by their national standards bodies.

V Confirmation of report of the previous meeting

11. The report of the previous meeting held in Berlin was accepted as written.

Agenda item #2: MATTERS ARISING FROM THE PREVIOUS MEETING AND REVIEW OF ACTIONS

VI Review of action items

12. The meeting reviewed the action items from the previous meeting, noting the status of each as follows:

Action Item	Status
Item 12.5 of 17th report **SWG** – To address important issues identified.	Mr Dick Schnacke ran through the "action required" items with updates. He provided a summary of activities undertaken to address the issues identified (please refer to section IX of this report for the details).
Item 14.2 of 17th report **Motorola** – To complete a draft of ISO 18185-4 (Gen 1) by 15th August 2005.	Completed (doc. WG 2 N237)
Working Group members – To review draft proposal for ISO 18185-4 (Gen 1) by 31st August 2005.	Completed
Mr Goh Hock Nguan – To submit ISO 18185-4 (Gen 1) to the Secretariat of ISO TC 104/SC 4 for CD ballot by 1st September 2005.	Completed; CD ballot closes 2005-11-20
Item 15.2 of 17th report **Mr Jorn Heerulff** – To complete and circulate a proposed ISO/CD 18185-6 for review and consideration at the 18th ISO TC 104/SC 4/WG 2 meeting in Nagoya.	Completed and distributed by e-mail (doc. WG 2 N239)
Item 15.3 of 17th report **Mr Michael Wolfe** – To develop and circulate a draft security practices annex for review and comment.	Completed and distributed by e-mail (doc. WG 2 N248)

Agenda item #3: UPDATE ON WORK ACTIVITIES OF ISO TC 122/104 JOINT WORKING GROUP

VII Brief status report

13. Mr Craig Harmon, Convenor of ISO TC 122/104 JWG, reported briefly on the supply chain applications of RFID documents status. He informed the meeting that the following committee drafts had been approved in the voting procedure.

a) ISO/CD 17363 (Supply chain applications of RFID – Freight containers)
b) ISO/CD 17364 (Supply chain applications of RFID – Returnable transport items)
c) ISO/CD 17365 (Supply chain applications of RFID – Transport units)
d) ISO/CD 17366 (Supply chain applications of RFID – Product packaging)
e) ISO/CD 17367 (Supply chain applications of RFID – Product tagging)

14. A meeting of ISO TC 122/104 JWG will take place on October 20-21 to resolve CD letter ballot comments (co-located to facilitate attendance by ISO TC 104/SC 4/WG 2 members).

Agenda item #4: REGULATORY UPDATES – ACTIVITIES AND STATUS

VIII Regulatory information

15. Mr Robert Knetl (DHS Science and Technology observer to this meeting) provided clarification from Mr James Patton (DHS Policy Director for Cargo Security and Trade), which is reproduced below for members' convenience:

There is a Notice of Proposed Rulemaking for Seal Verification forthcoming within the next few months which will allow for industry deliberation and comment for alternative approaches to seal verification. This announcement and subsequent process will allow the industry a significant amount of time for feedback and discussion of alternative approaches to be vetted (by approximately 9 months after the draft rule release).

16. In light of the stage that DHS policy is currently in regarding this rulemaking process, and his removal from that process, Mr Knetl was unable to answer questions of specificity raised by the Working Group members.

17. Jürgen Reinold brought mention that the World Radiocommunication Conference is scheduled to take place in 2007 and highlighted his intend to participate.

Agenda item #5: SUB-WORKING GROUP UPDATE ON ACTION ITEMS

IX Update on SWG's work since the July 25-26 ISO TC 104/SC 4/WG 2 meeting (Berlin)

18. Mr Dick Schnacke, leader of the Sub-Working Group (SWG), opened the SWG's presentation by illustrating highlights of recent activities, viz. joint meeting with marine terminal operators, port tours and survey of terminal operations and requirements, which were believed to contribute importantly to the standard

development work. He took the opportunity to express his appreciation on behalf of the SWG for the well-executed port tours as well as the constructive responses of the marine terminal operators to the survey questionnaires.

19. Mr Schnacke provided an introductory overview of the background, objectives and composition of the SWG. The SWG, comprised of technology suppliers, consultants and other interested parties, was formed in May 2005 (London) to address several specific technical issues. He outlined the tasks set for the SWG and also cited the complementary role of the World Shipping Council.

20. The following is a summary of status of issues and recommendations presented for comment and discussion.

Generation 1 vs 2 security solution (ISO 18185-4)	***Issue***: Separate the security solution into 2 parts: ▪ Generation 1: defines a physical level of post-mortem capability ▪ Generation 2: implements a key-based security solution and defines a combined physical/electronic post-mortem capability
	Task: Recommend logical separation and content of Generation 2.
	Status: Draft of ISO 18185-4 (Generation 1) currently undergoing CD ballot.
	Recommendation: To close this item.
Control of unintended wakeup	***Issue***: High-power emissions, in support of high-reliability reads, risk waking up seals outside the intended zone, thus depleting their batteries.
	Task: Confirm or deny problem. Propose solution if needed.
	Status: Savi to address. Testing done in support of this task. To be addressed under `localisation'.
Reading seal `in the slot' between paired containers	***Issue***: Twin-20 configurations create a narrow slot where seals must be read.
	Task: Confirm ability of presently-defined technical solution(s) to read reliably in this configuration.
	Status: Savi to address. Testing done in support of this task.

	To be addressed under `localisation'.
Reliability / accuracy	***Issue***: Presently-stated requirements may create undesirable system results (high-power emissions, unintended tag wakeups and/or higher system costs).
	Task: Make recommendations on possible easing of present requirements.
	Status: Issue related to other discussions of localisation and battery life. Mixed positions on reducing requirements. Professor Rebeiz recommended a reasonable requirement (i.e. 99.9%).
	Recommendations: ▪ Accept Professor Rebeiz's conclusion and reduce the read reliability requirement to 99.9%. o MTOs more comfortable with 99.99% o 99.99% can be provided, with potentially higher costs/complexities ▪ Reduce the read accuracy requirements to 99.998%, allowing use of the bit counts currently in the protocol. o 99.9999% can be provided, with change to ISO 18185-1 protocol
FCC regulations	***Issue***: Conflicting information on regulation provided by Savi and Motorola (especially related to timing available for tag reads and `tag resolution').
	Task: Resolve conflict and provide clarity.
	Status: Savi and Motorola to report.
Japan's reliability requirements	***Issue***: Requirements insist upon high levels of reliability and accuracy. May affect ability to lessen present specification (or worse, require tightening).
	Task: Research this to provide understanding.
	Status: No product. More definition of problem needed.
Localisation	***Issue***: Users desire some measure of localisation when reading container tags and seals and are considering a formal new

	user requirement.
	Task: Research the whole topic of localisation, report on what is possible using presently-defined tag/seal solutions and make recommendations.
	Status: Significant work done in preparation for working group discussion. Presentation planned and recent tests done by Savi (to be reported).
	***Potential solutions (or aids) to localisation*:** ▪ Received signal strength ▪ Multiplexed antennas using differential time of arrival ▪ Choice of antenna design ▪ Antenna angled offset ▪ Trip wire ▪ Lower power ▪ Seal contains identity of container ▪ Complementary short-range link
	***New definitions*:** ▪ Seal integrity check: o Reading a seal to determine that it is still intact o `Assumptive association' using databases ▪ Seal verification: o Reading a seal to determine that it is still intact and that it is still associated with the proper container o Association through live interrogations of seal/box
	Proposed direction: ▪ Savi has proposed a specific technical implementation to achieve localisation. o Uses low frequency (114-127 KHz), short-range link (SRL) as adjunct to 433 MHz active (LRL) link o Proven o Low incremental cost to the seal ▪ Hi-G-Tek concurs with basic approach but differs in some protocol and implementation issues. o Two-way short-range link o Protocol differences, to enable expanded capabilities and better harmonize with existing parts of ISO 18185 ▪ Savi and Hi-G-Tek to describe approach(es), including `how does it work'.
	Effects on existing documents: ▪ Changes to existing standard ▪ Affects Part 1, 2 and 7: o Part 1: Addition of protocol elements related to SR LFL

	communications o Part 2: Addition of operational requirements related to locali2ation, including accuracy requirements o Part 7: Addition of new chapter to define LF air interface
Potential new work item proposal	***Issue***: Present direction of group supports near-term definition of initial seal capabilities and continued work toward next generation enhancements. Berlin resolution to consider NWIP for `complementary features and improved protocol' for electronic seals.
	Task: Provide recommendations on potential work package to support next generation enhancements.
	Status: No product. To be discussed in this meeting.

21. The Convenor thanked Mr Dick Schnacke for the presentation. He acknowledged the contributions of the SWG and thanked Mr Dick Schnacke and members of the SWG for their hard work on this important endeavor.

22. The SWG update also featured a video presentation from Mr Fraser Jennings to provide an illustration of tests performed to demonstrate use of the LFL to localise, read seals in difficult locations and control unintended wakeup of seals. Following the showing of this video, Mr Jennings pointed out that the gate testing demonstration of 2005-09-29 convincingly demonstrated that the Savi UHF protocol at 433 MHz is fully capable of reliably waking up and reading difficult-to-read active tags (i.e. tags between containers) at speed up to 30 mph without waking up "stored" tags 50 feet away from the truck lanes.

23. The meeting also received a presentation from Mr Jürgen Reinold on electronic seal verification scenarios, which was developed during a working session of ocean carriers, marine terminal operators and technology companies in Singapore (October 2005).

24. The members contributed energetically to a lively discussion, which concluded with agreement on:

a) Establishment of a new Localisation SWG and to disband the current Technical SWG

The Localisation SWG is formed to accomplish the desired goal of generating a proposed approach for localization. It will be jointly led by Lars Kjaer (WSC), a representative from NAWE and Todd Drake (Motorola). All interested parties are invited to participate.

b) Development of requirement tables and verbiage suited for inclusion in ISO 18185-2.

Motorola is to convert seal verification scenarios developed in Singapore ad-hoc meeting into requirement tables and verbiage suited for inclusion in ISO 18185-2. Resulting product will be inserted as requirements paragraphs and

requirements tables in clause 4.10 and circulated to the working group for review.

c) Reliability/accuracy requirements

Reliability of reading a seal under all operational scenarios will be stated as 99.99%. Read accuracy requirement will be stated as 99.998%. These requirements will be included in ISO 18185-2 along with language making clear that this is a user requirement, not a technical (radio) requirement.

Agenda item #6: ISO/DIS 18185-2 "APPLICATION REQUIREMENTS" AND ISO/DIS 18185-3 "ENVIRONMENTAL CHARACTERISTICS" – BALLOT COMMENT RESOLUTION

X Disposition of comments on DIS ballot of ISO 18185-2 "Application requirements"

25. The DIS of ISO 18185-2 "Application requirements" had been approved with 89.47% positive vote, thus allowing this draft standard to be elevated to a FDIS.

26. The substantive and editorial comments were each considered and appropriate remedies were approved by the working group. All adjustments proposed (including Motorola's inputs for inclusion in clause 4.10) shall go in the version to be prepared for FDIS. Mr Craig Harmon was entrusted to take care of the adjustment of the draft standard and upon approval by ISO TC 104/SC 4/WG 2 (following a 30-day comment period) to submit the FDIS manuscript to ISO Central Secretariat for a 2-month ballot.

XI Disposition of comments on DIS ballot of ISO 18185-3 "Environmental Characteristics"

27. The DIS of ISO 18185-3 "Environmental characteristics" had been approved with 94.73% positive vote.

28. The comments accompanying the voting results were discussed and effort was made to address the disapproval. Discussion took place on clarification of some points regarding the Japan's comments on clause 4.7 of ISO/DIS 18185-3. Consequently, Japan's vote of disapproval has been changed to an affirmative vote.

29. The comments accompanying the voting results were resolved and the disposition of comments report was generated.

30. With the reversal of the lone negative vote, the DIS of ISO 18185-3 has achieved 100% approval from the P-members of ISO TC 104. It was recommended and agreed that the document shall be revised to reflect all decisions of this meeting and thereafter proceed to the publication stage. The Chairman and secretariat of ISO TC 104/SC 4 would be asked to confirm the recommendation.

Afternote – On 25 October 2005, Mr Shinji Hayase (Chairman of Japanese Container Committee) sent a note to the Chairman and Secretariat of ISO TC 104/SC 4 informing them that their negative vote on ISO 18185-3 is converted to a positive vote.

31. The Convenor expressed appreciation to Mr Craig Harmon for acceding to the request to prepare the disposition of comments reports and revised documents for

ISO 18185-2 “Application requirements” and ISO 18185-3 “Environmental characteristics”.

Note - The disposition of comments reports are available in www.autoid.org/tc104_sc4_wg2.htm

Agenda item #7: DEVELOPMENT OF ISO 18185-1 “COMMUNICATION PROTOCOL”AND ISO 18185-7 “PHYSICAL LAYER”

XII Proposed next step

32. Ms Julia Zhu presented a harmonised proposal from the SWG on a new LF SRL (Low-Frequency Short-Range Link). The link was defined as valid for 3-18 feet. A summary of changes/additions required to ISO 18185, Parts 1 and 7 was shown. For sharing, Mr Daniel Li highlighted the various operational scenarios in handling containers in Hutchison port.

33. In the interest of moving forward with the drafts of ISO 18185 Parts 1 and 7, a proposal was made to go ahead with the current documents (without adding LF information) for DIS ballot and to implement localisation as part of the ballot commenting process. A discussed ensued. In concluding the discussion, the meeting agreed to circulate the current drafts of ISO 18185, Parts 1 “Communication protocol” and ISO 18185-7 “Physical layer” for a 5-month DIS ballot. The work on localisation issues will continue in parallel and be submitted as national comments.

Agenda item #8: DEVELOPMENT OF ISO 18185-4 “DATA PROTECTION”

XIII Presentation on eSeal Protection Protocol (ePP) for ISO 18185-4

34. The Korean delegate, Mr You Sung Kang, presented for information a proposal for development of ISO 18185-4 Generation 2 specifications. The presentation described a security protocol for protecting confidential information between an electronic seal and its associated reader, which supports mutual authentication, data confidentiality, data integrity, non-repudiation of stored data, immunity to DoS, and replay protection. Brief summaries of information related to ePP effects, procedure, packet structure and performance analysis were provided during the presentation.

35. The Convenor thanked Mr You Sung Kang for the presentation and indicated that the proposal would be considered during the development of ISO 18185-4 Generation 2 specifications.

XIV Development of data protection specifications – project phases

36. The Convenor expressed appreciation to the experts for their excellent contributions to the development of ISO/CD 18185-4 (Generation 1) which has progressed to the CD ballot stage.

37. The meeting concurred that the development of ISO 18185-4 (Generation 2) would take place at a later stage upon the completion of ISO 18185-4 (Generation 1).

Agenda item #9:	DEVELOPMENT OF ISO 18185-6 "MESSAGE SETS FOR TRANSFER BETWEEN ELECTRONIC SEAL READER AND HOST COMPUTER"

XV Revised draft standard for review and comment

38. Mr Jorn Heerulff, Project Leader of ISO 18185-6, provided an overview of the current specifications update effort and details of some of the challenges and accomplishments.

39. He updated the members on the revisions made to the draft standard, which took into account comments received from this working group in addition to the results of the UN-CEFACT TBG3 discussion. The revised draft standard contained new provisions on a draft COSEAL segment table and message structure boiler plate text, as well as including a modified scope as follows:

This part of the ISO 18185 established a standard message guideline for seal reader-to-host computer communications. This is to provide seamless exchange of accurate, complete, and timely seal data at the container transportation chain to ensure efficiency and accountability related to the seal verification process. This message will fulfill the requirements for improved security of transport information related to security against terrorism a well as theft and traditional contrabond.

40. The meeting discussed the merits of the draft standard and reached agreement on the following steps:

a) Withdraw the COSEAL structure from the draft of 18185-6.

b) Revise the scope of ISO 18185-6 to cover the EDI messages exchanged by parties involved in the seal verification processes (the document title and scope may be revised to better reflect this change).

Comprise a two level set of messages:

- Level 1 message: RFID reader (system) to local host/client (MTO system)
- Level 2 message: local host/client (MTO system) to host/hub (carrier/third party system) in the form of basic reference to currently used message sets at level 2

c) Reintroduce relationship with the container as required to conform to "localization" requirements.

d) Propose/design a simple interface message for level 1 and to consider relevant existing EDIFACT messages for this.

XVI Draft security practices annex for review and comment

41. Mr Michael Wolfe, author of the draft security practices annex, opened the discussion by inviting members to provide feedback on the proposal which was circulated in advance of this meeting to members for their review.

42. The group discussion ranged widely as participants shared information, concerns and suggestions.

43. In the light of the discussions, Mr Michael Wolfe and Mr Craig Harmon will revise the draft security practices annex and submit the result as a U.S. contribution for ISO 18185-4 CD ballot.

Agenda item #10: DATES AND VENUES OF FUTURE MEETINGS

XVII Future meetings

44. The subsequent meetings of ISO TC 104/SC 4/WG 2 are scheduled for 24-25 January 2006 (Oakland) and 9-10 May 2006 (DenHaag).

Afternote : January meeting might not be necessary based on forwarding ISO/DIS 18185, Part 1 and 7 for voting and not having the letter ballot responses back yet.

Agenda item #11: ANY OTHER BUSINESS

XVIII Other business

45. No other business was identified.

Agenda item #12: RESOLUTIONS OF THE 18TH ISO TC 104/SC 4/WG 2 MEETING

XIX Approval of resolutions

46. The draft resolutions were displayed for review and comment.

47. The adopted resolutions were:

Resolution 1 - It is resolved that the reliability of reading a seal under all operational scenarios will be stated as 99.99% and read accuracy requirement will be stated as 99.998%. These requirements will be included in ISO 18185 Part 2 along with language making clear that this is a user requirement, not a technical (radio) requirement.

Resolution 2 - It is resolved that, after including seal verification scenarios as discussed in the Nagoya meeting, ISO 18185-2 will be circulated again for a 30-day comment period. Assuming no further comments, the document will be released for FDIS ballot. If comments are received, they will be dealt with through an open email resolution process if possible or, worst case, at the next meeting of TC104 SC4 WG2.

Resolution 3 – It is resolved that ISO 18185-3 is released for movement to the next document stage. With no outstanding negative DIS votes and all comments resolved, it is recommended that this document go straight to IS status. If ISO disallows this path, the document is released for immediate FDIS ballot.

Resolution 4 - It is resolved that ISO 18185-1 and 18185-7 will be forwarded for DIS ballot in their present form with a ballot cycle specifically defined to be five months long. This extended ballot duration allows technical and user representatives to continue working toward an agreed approach to satisfy the localization requirement.

Resolution 5 - It is resolved that the current Technical Sub-Working Group will be disbanded and replaced with a new Localization Sub-Working Group. This group will be jointly led by Lars Kjaer (WSC), a representative from NAWE and Todd Drake (Motorola). All interested parties are invited to participate. The group is charged with performing tasks considered necessary to remove uncertainty from the topic of localization and developing a recommended approach to accomplish it.

Resolution 6 - Members of the Technical Sub-Working Group are thanked for their hard work over the last months.

Resolution 7 - It is resolved that the scope of ISO 18185-6 will be changed to cover the EDI messages exchanged by parties involved in the seal verification processes and the document title and scope may be revised to better reflect this change.

Resolution 8 - ISO TC104 SC4 WG2 thanks JAISA for hosting this meeting and for the excellent arrangements. Akira Shibata, Hiroshi Imai, and Akiko Matsuoka are specifically thanked for their help in arranging and facilitating this meeting.

48. The Convenor thanked the drafting committee for their excellent work in preparing the meeting resolutions.

Agenda item #13: CLOSURE OF THE MEETING

XX Adjournment

49. The meeting ended with expressions of gratitude to the hosting organisation, Japan Automatic Identification Systems Association, and specifically to Mr Akira Shibata, Mr Hiroshi Imai and Ms Akihiko Saito for their magnificent meeting organisation.

50. The Chairman also thanked all participants for a productive meeting. This was followed by remarks of appreciation to the authors of the various documents and members of the resolution drafting committee.

51. The meeting was adjourned at 1830.