

**MINUTES
of
TSCC MEETING
Held
March 14th, 2007
Las Cruces, New Mexico
Hotel Encanto Las Cruces**

The meeting was called to order by Chairman James Yates at 0800 hours.

MEMBERS AND ALTERNATES PRESENT

Scott Brierley	Member
Tim Chalfont	Member
Lee Eccles	Member
Ed Greenberg	Alternate
Sheila Horan	Member
Sid Jones	Member
Greg Kazz	Member
Bill Rymer	IFT Representative
James Yates	Member
Jim Perkins	Guest
Stephen Nicolo	Member
Russ Jedlicka	Member
Tim Gatton	Alternate
Phil Macias	Member

*available for voting in RCC/TG

ATTENDANCE AND DETERMINATION OF QUORUM

James Yates

There was a quorum present.

REVIEW AND APPROVE AGENDA

James Yates

Review and approved agenda without change.

OFFICER REPORTS

Chair

James Yates

- Our bank account has grown in size and we have done an admirable job of keeping expenses down. We may choose not to ask the IFT for funding this calendar year or ask for reduced funding.
- The TSCC committee and subcommittee members reviewed several standards over the past 12 months, including some CCSCS pink sheets, DDML (data display markup language – no comments), RF handbook, IRIG-106 - Chapter 10.
- We need to get more ‘traction’ from the subcommittees. Many members on subcommittees haven’t been active in several years and have not worked on review standards in many years.

Vice Chair

Sheila Horan

No specific report from the vice chair

Secretary-Treasurer

James Yates – acting for
David Grebe

Financial Report

The secretary/treasurer was absent, but provided the following report:

FINANCIAL STATEMENT **For the period of 24-Oct-2006 thru 11-Feb-2007**

Income

Funding Received, IFT	\$1,000.00
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Expenditures

Domain Name Renewal (thru 1/3/2010)	\$ 74.97
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<u>Net Increase in Cash</u>	\$ 925.03
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<u>Beginning Cash Balance</u>	\$2,288.93
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<u>Ending Cash Balance</u>	\$3,213.96
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The financial report was approved as stated.

COMMITTEE REPORTS

Nominating Committee

Lee Eccles

The TSCC currently has fourteen members, leaving two open positions

Two members (Russ Jedlicka and Steve Nicolo) are not currently on the TSCC web site and need to be added.

The Nominating committee had met, and had nominated two members for TSCC membership: Michael Rice from Brigham Young University and John Kolb from Acra.

Michael is well known to anyone who has attended ITC and will be a valuable asset to the TSCC. At the last ITC, Michael Rice had stated that he would be willing to serve on the TSCC. However Sheila Horan had since spoken with him and Michael and found he is not willing to serve. There was also some discussion about a possible conflict of interest since he is on the IFT board, but more importantly the IFT board responsibilities will likely mean a time conflict for attending TSCC meetings.

John Kolb has indicated his interest in becoming a member of the TSCC. John is the president of ACRA Control (manufactures PCM Encoders). At the time of the nominating committee report, a full quorum was not present (some members attending other RCC meetings), so voting on John Kolb was deferred to later in the meeting.

The mix of members is:

- 8 Industry
- 4 Government
- 2 Academia

The bylaws state that one-third commercial, one-third government, and the remaining third are governmental, commercial, or academic. Non-US shall not exceed 25% of the total regular membership

One more government member is needed to meet the 1/3 quota. One more government member would make 1/3 of the US members, or 1/3 (rounded off) of the total membership

One membership slot is expected to open up after the Fall TSCC meeting with the expected resignation of George Manz. George will be looking for a replacement from NASA at KSC.

Tim Klinger (NASA/Analex) and Kirk Liang (NOAA) were suggested as possible government members. Possibly someone in the medical telemetry field could be another source.

Another possible source is someone from SWRI (Southwest Research Institute) with Myron Moody and Ben Abbott suggested as possibilities

Another suggestion was someone from Aerospace; Norm Lantz had some possible recommendations.

Radio Frequency

Scott Brierley

The RCC website public session was closed so could not go in and look for standards on the RCC website. It was announced in the RCC/TG meeting the day before that a new public website for the RCC had been released:

<https://wsmerc2vger.wsmr.army.mil/rcc/> is the new website for access to the RCC website

No new standards were reviewed by the RF subcommittee since the last meeting.

Data Multiplex

Absent Sub-Committee Chair

There was no report from the Data Mux Committee. The chair pointed out that we need to fill the vacancy on the Data Mux committee and Steve Nicolo volunteered to be committee chairperson. It was mentioned that the TG 84 pink sheets on Data Display Markup Language (DDML) will be added to chapter 9 of IRIG-106.

Networking and Protocols

Absent Sub-Committee Chair

There was no official subcommittee chair report, but an open conversation proceeded from the group.

IP over CCSDS data link will be added as a best practice document. It gives guidance on how data will be put into the link. The traditional way is put the data in packets in frames. Those framing structures already support IP versions 4 or 6. Take version 6 data gram and put in encapsulation packet. The “best practices” are being put in a new “magenta” handbook. This is added under the 702.1 red book. There is no “magenta” book yet, but it will be added later. CCSDS already supports IP, but the best practices book includes a list of the possible methods of incorporating IP Note. The following are the guides for book markings.

1. Red out for agency review
2. Green book is associated with blue book, supporting document.
3. Magenta new best practices

For the NASA Constellation program, they have a system that has double encapsulation. The intent was to allow commercial routers to save money, but there are concerns because there are no space qualified routers known at the present. Constellation has chosen one of the LPDC codes to use. LPDC uses coding rates 3/4 to 7/8 to rates up to 1/2, so there is a tremendous

difference in overhead and performance. For the LPDC codes, encoding is tough but decoding is tougher.

SOQPSK can be used as a coding scheme, but for systems that have a fixed bandwidth allocation the overhead costs 20% of available data.

How do we get international involvement with the RCC? One way is have subcommittees with international participants review the documents. The international members can review the public domain pink sheets, but US members cannot discuss or review them with the international members due to ITAR or EAR regulations.

Actions: Chalfant to check with RCC secretariat to ensure that documents are properly marked for ITAR and EAR.

For space link, we can use UDP, but IP is an issue. File transfer protocols have been created that require no response to transfer over space.

SCPS standards were done awhile ago

TP standard is basically TCP standard that uses best effort to allow working with longer delays, but not as long as deep space. It will work to the moon but not for longer distances. Changes consider weighting of congestion vs. corruption.

Transducers (DG needs to see in print)

Lee Eccles

Lee Eccles provided the transducer subcommittee report.

- IEEE1451.0 describes the general characteristics of a 1451 smart transducer. It is under IEEE balloting for acceptance. REVCOM is meeting next week; the IEEE board will decide if the standard should be acceptable or rejected.
- Includes the TEDS, the memory structure to describe the sensor, and the whole end-to-end shooting match. Does not describe the lower level communications protocols between the network nodes. A “.3” is in that category. The other one in that state is 1451.5, which is the wireless standard, the lower level under “.0.”
- There are 802.11, ZigBee, Bluetooth, 15.4, which is what ZigBee is under. This doesn't mean that you get a .5 network with Bluetooth that can use 802.11. Add wireless USB?
- 1451.3 is wired configuration, two wires, the home phone can use this wiring.
- Lee talked about using wireless in the airplane cabin, but they still have to run 28V power to them, which defeats the advantages of being wireless
- More discussion about using power over data lines (as opposed to data over power lines) The power buss is typically noisy to reliably transfer data, but if can work sending power over dedicate data lines.
- “.0” is complete, lot of capabilities in it, 200+ documents. XML schemas in it. It is on the IEEE web site.
- 1451.4 being updated, not sure where that stands.

- Instrumentation handbook updated including shielding. The 119 chapter 7 will be updated. Not sure if it is pink sheets.

Coding / Data Compression

Sheila Horan

- CCSDS document is now blue sheet.
- Provided sheet with info on standards; need to add the document number (122.0.b.1).
- Need to have statement of where the application is applicable.

Recorder / Reproducer

Tim Chalfant

Tim Chalfant provided the following.

- Chapter 10 pink sheeted last spring. Some of the content moved to IRIG-106 chapter 9 TMATs and chapter 6.
- There was a movement to make a more formalized release structure for IRIG standards. Deadline for changes need to be in 1 June 2007 to secretariat for changes to 106-07.
- Working hard on digital data recorder (chapter 6, 9, and 10).
- Recorder-wise, right now working data archive and naming conventions; future work will be a chapter 10 handbook.
- Task to update the test methods 118.
- Need to formulate the subcommittee. Dave Grebe is currently the only member.
- Joe Lloyd now retired and has not been replaced on the STANAAG.

ETTC

Gerhard Mayer

James made mention that Gerhard was unable to attend the TSCC meeting this time due to a conflict with his university schedule. He drew attention to ETSC session in ETC in Toulouse. TSCC members welcome to participate.

Old Business

Lee Eccles

TSCC Session.

Best paper was in the TSCC session. The session went very well.

Do we want to do a paper session? Abstracts due this month. Were due 15 March, may have been extended.

Idea: Have a session where each subcommittee that describes the standards that relate to the subcommittee. If it were done as a special session, could have the papers included in the TSCC web site instead of the ITC proceedings. This provides more flexibility than a formal ITC paper, the paper does not need to meet the ITC schedule.

Alternate proposal, each year have a session from a selected subcommittee.

Larry Rauch award will be given again this fall.

Web Site.

Suggested adding a section for the subcommittees. This would include a description of the subcommittees.

This would include:

- Standard number
- Summary and the first line of summary is the standard title
- Link Information
- Responsible organization

On the website where each subcommittee member is listed, should put affiliation for the subcommittee member.

Discussion on the subcommittees and should they be reassigned, particularly the Data Multiplex committee. Should this committee be disbanded and moved to the networks and protocols committee? The DDML standard came out of the Multiplex committee, but maybe this did not belong in this committee.

Do we need a new subcommittee to use data visualization and display? Tried to come up with the standards this committee would review:

1. DDML
2. XTCE, exchange data between spacecraft and sites

TMATS, DDML, and METADATA all share use of XML, so coming from the TG will have a lot of this XML data

New Business

A presentation was given by Ed Greenburg on LPDC codes.

LPDC are block codes.

Advantage of LDPC code is easier to implement than turbo codes.

The encoder uses 23% of FPGA.

Can get 720 Msps with rate $\frac{1}{2}$ code.

Second presentation given by Ed Greenburg on Data Compression:

Image compression consists of two stages:

Integer discrete wavelet transform (DWT)

Bit Plane Encoder (BPE)

Discussion on the format for the subcommittee reports: Should the “quad reports” of the RCC be implemented for the subcommittee report? A template was developed around the table. The chair will work into a form and distribute to subcommittee chairs before the next meeting for use them.

The chairman brought forth a discussion on whether there might be value on forming a data display and visualization/analysis committee. Standards that would be germane to this subcommittee might be:

- DDML
- XTCE

There was a discussion on the positives and minuses of holding the TSCC spring meeting concurrent with the RCC/TG meeting. It was eventually agreed that it was a positive thing and any negatives were outweighed by the benefits.

We then spent some time developing lists for standards that each subcommittee should be monitoring for changes. The following were brought forward.

Data Multiplex

RCC IRIG-106

RF

RCC IRIG-106

RCC IRIG 118

RCC RF handbook

CCSDS-411

COFDM

GMSK

SGLS

STDN

1451.5

Network & Protocol

RCC IRIG-106 part 2 (future)
SCPS
CCSDS
UDP/TCP
SNMP
IEEE-1588
FTP

Recorder

RCC IRIG-106, chapters 6 & 10
RCC IRIG-118
RCC IRIG-119
STANAG 2745 Recce/Intel
ANSI ID-1
AGARD
MIL_STD-2179

Transducer

IEEE-1451
ISA 100
FieldBus Foundation
NIST-ISO-ANSI-IEEE?
RCC Instrumentation handbook 118 and 119
Flight Project Practices (CCSDS)

Coding & Compression

Turbo Codes
LDPC
JBIG
ZIP
FEC
Tornado
Convolutional: Viterbi, Reed Soloman
DVBS-dig
HDTV
CVSD

Voting session

All

A quorum was obtained so member voting began.

- Approved: John Kolb approved as a member of the TSCC.
- Should the TSCC have a special session at ITC: Yes in 2008 but not in 2007.
- Should the Data Multiplex committee be dissolved and put into the networking committee? This was an advisory vote since it is the responsibility of the chairman. It was voted against by a 4 to 3 with the rest of the committee abstaining.

Actions

All

Tim Chalfant - Check with RCC secretariat to ensure that documents are properly marked for ITAR and EAR.

James Yates - Web updates to be submitted by the chair:

- Alternate for Tim Chalfant is Loren Klien from England.
- Two members (Russ Jedlica and Steve Nicolo) are not currently on the TSCC web site and need to be added.
- Fix RCC/TG link to <https://wsmrc2vger.wsmr.army.mil/rcc/>
- Add agreed upon standards to individual subcommittee web pages
- Add the inet meeting information, and post on the web site.

James Yates – Develop template for subcommittee reports for use at TSCC meetings from basis agreed upon at spring meeting. Distribute to subcommittee chairs previous to upcoming fall meeting.

Sheila Horan – Will look into affiliation with other standards groups – IEEE, AIAA, ANSI, etc.

All –

- If we know of other potential members, send the information to Scott.
- Subcommittees should send web changes to James and Marjorie.

Having no further business the meeting was adjourned at 1647 hours.