Cellular Networking Perspectives

Editor: David.Crowe@cnp-wireless.com Vol. 11, No. 2 February, 2002

In This Issue...

Overview of 3GPP TSG T: Terminals.....p. 1

3GPP TSG T is responsible for the development of terminal-specific standards, including test specifications, for 2G GERAN (GSM) and 3G UMTS (W-CDMA) systems. This article describes the structure of the Technical Specification Group, what it is working on and how the work is progressing.

TIA TR-45.2/3GPP2 TSG-N Wireless Network Standards p.4

An updated report on standards that support 2G and 3G wireless networks for mobility management, including the TIA/EIA-41 standard for automatic roaming and emerging work on All-IP networks for 3G systems based on cdma2000.

Next Issue: March 4th, 2002

Circumnavigating SS7: To be concluded…

Our series of articles on SS7 will conclude with a discussion of MTP in our March, 2002 issue.

Overview of 3GPP TSG T: Terminals

This is the first in a series of articles on 3GPP Technical Specification Groups (TSGs) which are responsible for the ongoing development of GSM standards and the emerging W-CDMA standards. A diagram of all the TSGs, WGs (Working Groups) and SWGs (Sub-Working Groups) is in our August, 2001 issue.

3GPP TSG T is responsible for specifying logical and physical terminal interfaces, terminal capabilities and terminal performance and testing for Wideband CDMA (W-CDMA) systems. TSG T does not cover the radio aspects of terminals; this is the responsibility of TSG RAN. Nor does it cover speech and multimedia codecs, which is the responsibility of TSG SA WG 4.

Terms and Acronyms

For definitions of technical terms and acronyms used in this article, consult:

www.cnp-wireless.com/glossary.html

TSG T Responsibilities

- UTRAN-based Terminal Equipment (TE) performance specifications.
- USIM ('Smart Card') and its interface specifications.

TSG T Work Areas

- Service capability protocols.
- Messaging.
- Services end-to-end interworking.
- SIM/USIM to MT (Mobile Terminal) interface and functionality.
- Framework for terminal interfaces and service execution.
- Conformance test specifications of terminals, including radio aspects.
- Multi-mode terminals.

TSG T Structure

Figure 1 shows the WGs (Working Groups) and SWGs (Sub-Working Groups) that make up TSG T. Each WG is also described below.

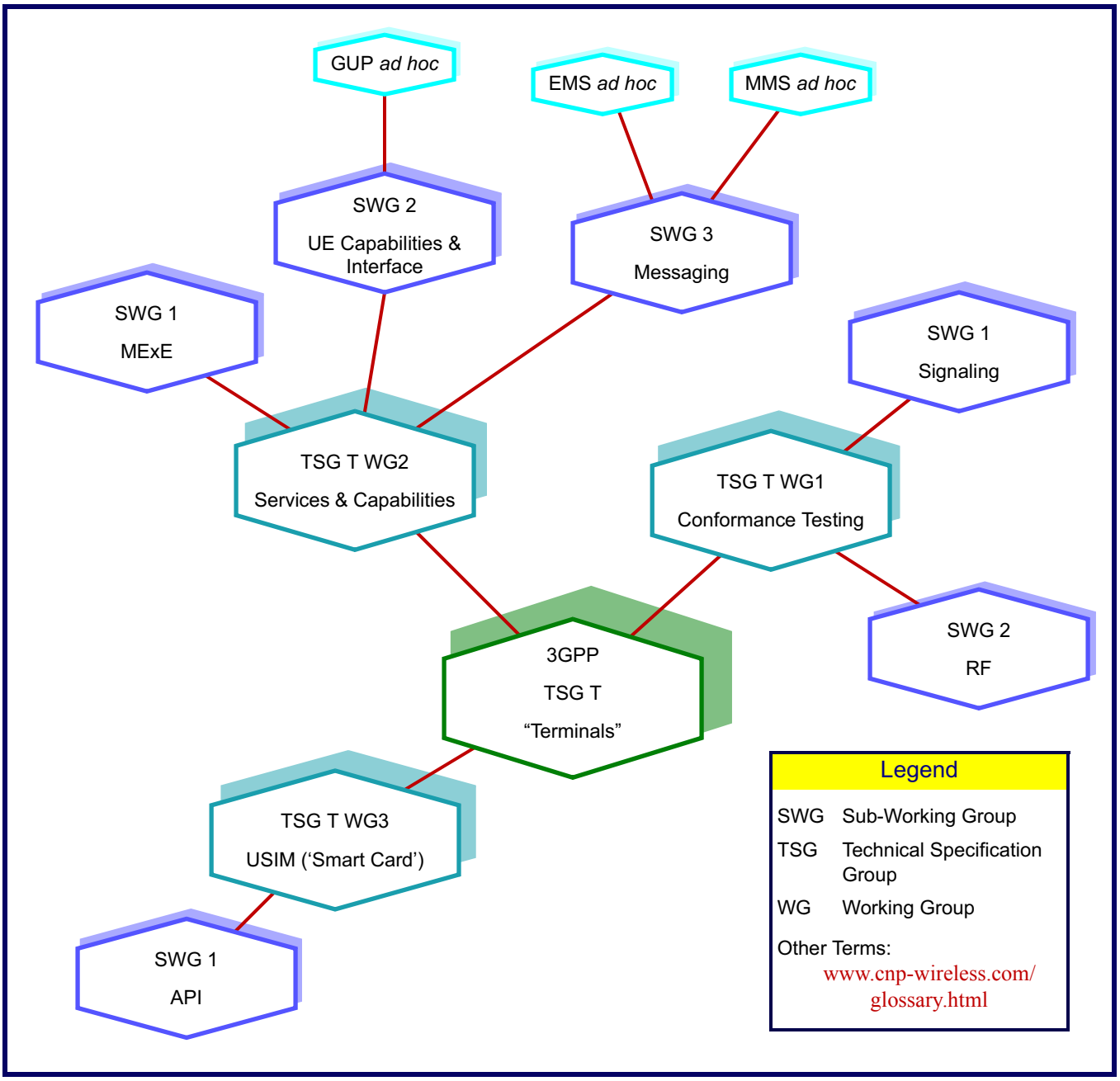
TSG T WG1: Mobile Terminal Conformance Testing

TSG T WG1 is responsible for the drafting of the User Equipment (UE) conformance testing specifications for 3GPP standards based on requirements defined by other groups. These include TSG RAN WG4 for radio test cases, and TSG RAN WG2 and TSG CN WG1 for the signaling and protocols test cases.

Editor: David Crowe.
Accounts: Evelyn Goreham.
Marketing: Muneerah Vasanji.
Distribution: Debbie Brandelli.
Production: Doug Scofield.

Cellular Networking Perspectives (issn 1195-3233) is published monthly by Cellular Networking Perspectives Ltd., 2636 Toronto Crescent NW, Calgary AB, T2N 3W1, Canada. **Phone:** 1-800-633-5514 (+1-403-274-4749) **Fax:** +1-403-289-6658 **Email:** cnpsales@cnp-wireless.com **Web:** www.cnp-wireless.com
Subscriptions: CDN$350 in Canada (incl. GST), US$350 in the USA and US$400 elsewhere. Payment by cheque, bank transfer, American Express, Diners Club, MasterCard or Visa. **Delivery**: Email or 1st class mail.
Back Issues: Single issues are $40 in the US and Canada and $45 elsewhere, or in bulk at reduced rates.
Discounts: Educational and small businesses: 25% off any order. **Copies**: Each subscriber is licensed to make up to 10 copies of each issue or back issue. Please call for rates to allow more copies.

Figure 1: TSG T Organization



TSG T WG1 is divided into:

- SWG 1: Signaling.
- SWG 2: RF (Radio Frequency)

It addresses the following subjects:

- RF performance conformance testing of FDD (Frequency Division Duplex) and TDD (Time Division Duplex).
- Radio Resource Management (RRM) conformance testing of FDD and TDD.
- Protocol testing for UTRA (signaling to base equipment) and NAS (Non-Access Stratum; signaling to core network passing transparently through base equipment).
- Testing of inter-technology procedures and UTRA-to-GERAN-only service capability testing (for services with a 3GPP core specification).
- Formal description of protocol test cases using TTCN (Tree and Tabular Computational Notation)

As of December 2001, WG1 had two radio test specifications nearly complete:

- TS 34.121 – Terminal Conformance Specification, Radio Transmission and Reception (FDD)
- TS 34.122 – Terminal Conformance Specification, Radio Transmission Reception (TDD)

Signaling test specifications, test cases for regulatory purpose and common test conditions for user equipment conformance testing are still under development.

TSG T WG2: Mobile Terminal Services & Capabilities

Working Group 2 is responsible for the Services and Capabilities to be delivered on 3GPP Terminal Equipment and to ensure terminals meet 3GPP objectives. In general, the group is responsible for terminal-based applications, features and interfaces.

Areas of study for TSG T WG2 are:

- Messaging, including Short Message Service (SMS), Cell Broadcast Service (CBS), Multimedia Messaging Service (MMS), and new trends facilitating global access to messaging based applications.
- Model and framework for terminals and their interfaces (Terminal Local Model), including interaction between an MT, external terminals and the 3GPP networks
- Model and framework for service or application execution (MExE)
- UE Application Management (management of parameters and objects applied to applications and services within, and remote from, the UE).
- Synchronization of data: Local to the UE, and "wide area" across the 3GPP network
- Specification of data types for synchronization

WG 2 is organized into 3 subgroups:

1. SWG1 – MExE (Mobile Execution Environment).

   MExE provides a standardized execution environment in a UE, and the ability to negotiate its supported capabilities with a MExE service provider, allowing applications to be developed independently of a single UE platform. Status as of December 2001 was:

   - MexE Rel5 enhancement is on schedule, but there has been little progress on MexE lite.
   - A new work item was proposed for a run-time independent classmark.
   - General agreement on the Classmark 4 Common Language Infrastructure (CLI) has been reached, but a CR has not yet been finalized.
   - Discussions on a security 'toolbox' continue.

2. SWG2 – UE Capabilities and Interface

   The major work items are:

   - Stage 2 and 3 for the Generic User Profile (GUP), for which it has secondary responsibility.
   - The work item 'vObjects and other constructs in data synchronization' might be merged with GUP.

3. SWG3 – Messaging

   Work has temporarily been split between an MMS *ad hoc* (3G multi-media messaging) and EMS *ad hoc* (GSM enhanced message service).

   The status of the MMS *ad hoc* is:

   - Completion of MMS Rel 5 is at risk for March 2002
   - IETF enum will be used for address resolution in the long term. In the interim, proposals for direct and indirect number portability are being reviewed
   - The basis of a Stage 2 for MM7 (interface with value added service applications) has been produced. A decision on the underlying protocol is crucial before proceeding to Stage 3
   - Digital Rights Management will not be part of Rel 5.
   - Only a WAP-based MMS - MM1 interface (MMS user agent – MMS server/ relay) will be implemented for Rel 5.

   EMS *ad hoc*:

   - Work is progressing on EMS vector graphics and polyphonic sound.
   - Discussions continue on interoperability and object Distribution.

TSG T WG3: USIM

TSG T WG3 is responsible for most specifications involving the 2G GSM SIM (Subscriber Identity Module) and the 3G USIM (Universal SIM). The exception is security algorithms, which are developed by TSG SA. WG3 also maintains specifications and associated test specifications for the 3G USIM and its interface with the Mobile Terminal.

Areas of study for TSG T WG3 are:

- USIM functionality to support 3G security requirements.
- Capabilities for service creation (e.g. evolution of SIM Application Toolkit and APIs).
- Download mechanisms for applications.
- Specification of the USIM application as part of a multi-application card in a single or multi-card reader terminal environment.
- Evolution from current service capabilities, based on the SIM, into a form suitable for 3G (e.g. user groups for ADN, storage of call records), while maintaining backwards compatibility.
- Enhancements to the current electrical and mechanical interface of the SIM (e.g. electrical parameters, transport protocol, size), while maintaining backwards compatibility.
- Plastic roaming (i.e. moving SIM/ USIM between phones) between 3G and 2G systems (GSM and others, such as ANSI-41).

TSG T WG3 is currently working on the following items:

- TS 31.114 – Toolkit interpreter; protocol and administration (R5).
- TS 31.131 – C-Language binding for USIM API (R5).
- Update to SIM toolkit test specification R99.
- ISIM (All-IP SIM) on a UICC (Universal Integrated Circuit Card) for IMS (IP Multimedia System). This is a new work item.
- USAT Interpreter test specification (R5). Estimated completion has slipped from early to late 2002.

Work items deleted becausse of lack of progress:

- 'Enhancements to secure messaging' and
- 'UICC-USIM transport Protocol'.

New versions are being developed for the following specifications:

- Java API
- USIM secure messaging
- USIM Application Toolkit
- SIM-ME interface
- Characteristics of the USIM Application

TIA TR-45.2/3GPP2 TSG-N Wireless Network Standards

Cellular Networking Perspectives

Editor: David Crowe • Phone +1-403-289-6609 • Email David.Crowe@cnp-wireless.com *Last published August, 2001*

Note: 1. IS - Interim Standard; TSB - Telecommunications Systems Bulletin; PN - Project Number; SP - ANSI Standards Proposal.
2. Bold Type indicates a modification since the previous publication of this information.
3. Published TIA standards can be obtained from TIA at www.tiaonline.org/standards/search_n_order.cfm

Superseded Interim Standards

Standard	Description	Status
J-STD-025	CALEA surveillance support (joint with ATIS T1) - interim standard	Published 12/97 Rescinded 05/01
J-STD-025-1	Addendum to J-STD-025	Published 07/00 Rescinded 05/01
J-STD-025-2	Addendum to J-STD-025	Published 07/00 Rescinded 05/01
IS-41-C	Cellular Radio Telecommunications Intersystem Operations	Published 02/96
IS-52-A	Uniform Dialing Procedures for use in Cellular Radiotelephone Systems	Published 03/95
IS-53-A	Cellular Features Description	Published 04/95
IS-725	IS-41 support for Over-the-air Service Provisioning (OTASP)	Published 09/97
IS-756	Wireless Number Portability (WNP), Phase I (database query)	Published 04/98
TSB29-A	International Implementation of Cellular Systems Compliant with TIA-553	Rescinded
TSB29-B	International Implementation of Wireless Systems	Rescinded
TSB29-B.1	TSB-29-B addendum including IFAST#6 updates (11/97)	Rescinded
TSB29-B.2	TSB-29-B addendum, including IFAST #7 updates (02/98)	Rescinded
TSB29-C	International Implementations of Wireless Systems	Published 09/99 Rescinded 12/00
TSB29-C-1	Addendum to international Implementations of Wireless Systems	Published 12/99 Rescinded 12/00
TSB41	Technical Notes for IS-41 Revision B	Published 11/94
TSB51	Inter-System Authentication, Signaling Message Encryption and Voice Privacy	Published 05/93
TSB55	IS-41 Rev. A/B Forward Compatibility ("Tech Notes")	Published 05/94
TSB64	Wideband Spread Spectrum Intersystem Operations	Published 02/94
TSB65	**Border cell problems**	**Replaced by TIA/EIA-41-D**

ANSI Standards and Annexes

ANSI Std.	Description	Status
J-STD-025	**ANSI version of J-STD-025**	**Published 12/00**
TIA/EIA-41-D	Intersystem Operations	Published 12/97
TIA/EIA-93-A	Ai and Di Interfaces Standard (including 9-1-1 Phase I cell/sector location)	Published 11/98

TIA/EIA-93-B	**Ai and Di Interfaces Standard (including JIP and 9-1-1 Phase II location)**	**Published 07/01**
TIA/EIA-124-B	Cellular Inter-System Non-Signaling Data Communications	Published 06/99
TIA/EIA-124-C	Support for WIN and CIBERNET NSDP-B-and-S protocol	Published 09/00
TIA/EIA-124-D	**Further enhancements to call detail and billing records**	**In press**
TIA/EIA-660	Cellular Dialing Plan (formerly IS-52)	Published 07/96
TIA/EIA-664	Cellular Feature Descriptions (formerly IS-53)	Published 06/96
TIA/EIA-664-A	**Cellular features Stage I description (formerly PN-3362)**	**Published 12/00**

Published TIA/EIA Interim Standards

Standard	Description	Status
J-STD-025-A	CALEA surveillance support (joint with ATIS T1) including FCC Report and Order requirements	Published 05/00
J-STD-034	Enhanced Wireless 9-1-1, Phase I: identify mobile and cell/sector location	Published 12/97
J-STD-036	Enhanced 9-1-1 (E911), Phase II (125 m. location accuracy)	Published 08/00
J-STD-036-1	Corrected and enhanced emergency services support for SMS, inter-system handoff and SAMPS	Published 12/00
IS-725-A	IS-725 enhanced to include Over-the-air Parameter Administration (OTAPA)	Published 07/99
IS-728	Inter-System Link Protocol (ISLP). Supports data calls after inter-MSC handoff.	Published 04/98
IS-730	TIA/EIA-41 Support for IS-136 DCCH (TDMA digital control channel)	Published 08/97
IS-735	TIA/EIA-41 Support for CDMA (Network directed system selection (NDSS) and Temporary MS Identifiers (TMSI))	Published 02/98
IS-737	TIA/EIA-41 support for circuit switched data services for CDMA and TDMA terminals	Published 04/98
IS-751	TIA/EIA-41 support for International Mobile Station Identity (E.212 IMSI)	Published 02/98
IS-756-A	Wireless Number Portability (WNP), Phase II (MDN/MIN separation to allow porting to or from wireless phone numbers)	Published 12/98
IS-764	Calling Name Presentation/Restriction	Published 06/98
IS-771	WIN (Wireless Intelligent Network) Phase I: voice controlled services and call screening	Published 07/99
IS-771-1	**WIN Phase I addendum**	**Published 08/01**
IS-778	Authentication enhancements	Published 03/99
IS-786	Automatic Code Gapping (ACG) Overload Control	Published 11/00
IS-807	Internationalization of TIA/EIA-41	Published 08/99
IS-807-1	Updates global title translation types in IS-807	Published 03/00
IS-808	User Identification Module (R-UIM) for use in 3G systems	Published 12/00
IS-812	TIA/EIA-41 message segmentation (to overcome SS7 network packet size limitations)	Published 08/99
IS-824	Broadcast/Multicast Short Message Service (BTTC)	Published 11/99
IS-826	WIN Phase II: Prepaid calling	Published 08/00
IS-837	Answer Hold (AH)	Published 07/00
IS-838	User Selective Call Forwarding (USCF)	Published 08/00
IS-841	MDN Based Message Centers	Published 09/00
IS-847	VLR Roamer Database Verification (RDV)	Published 03/01
IS-848	WIN Phase II: Enhanced Charging Services (Premium Rate Charging, Wireless Freephone)	Published 12/00
IS-875	Network based enhancements for international dialing, calling number id and callback	Published 05/01

Current Telcommunications Systems Bulletins

TSB	Description	Status
TSB56-A	Application Level Testing for IS-41 Rev. B, IS-53 Rev. 0 and TSB-51	Published 06/94
TSB76	PCS Multi-Band Support	Published 09/96
TSB114	Broadcast of emergency alert messages to wireless phones (EAS)	Published 12/99
TSB124	Support for WIN Prepaid (IS-826)	Published 10/00
TSB29D	**TSB-29 revision with IFAST-assigned IRM codes removed**	**Published 12/00**

Balloting TR-45.2 Projects

Standard	Project	Description	Status
J-STD-036-A	**PN-3890-URV**	**Enhanced 9-1-1 (E911), Phase II (125 m. location accuracy)**	**Ballot 01/02**
TIA/EIA-41-E	**PN-3590-RV5**	**Intersystem Operations, including TSB76, IS-730, 735, 737, 751, 756-A, 764, 771, 778, 807, 812, J-STD-034,**	**Ballot**
IS-847-A	**PN-4785RV1**	**RDV, allowing MDN range verification and query of nodes other than VLR**	**Ballot**
IS-880	**PN-4720**	**Intersystem support for 3G packet data, Phase I**	**Ballot 09/01**

Developing TR-45.2 Projects

Standard	Project	Description	Status
J-STD-025-A	**SP-4464**	**ANSI version of J-STD-025-A**	**On hold**
J-STD-025-B	**PN-4465-RV1**	**Surveillance of packet data communications (wireline and wireless)**	**Development**
TIA/EIA-41-F	**PN-3590-RV6**	**Intersystem Operations, including IS-786, 808, 824, 826, 837, 838, 841, 847, 848, 880, J-STD-036**	**Development**
TIA/EIA-660-A	PN-3544RV1	Cellular Dialing Plan	Development
IS-843	PN-4818	WIN Phase III: location based services	Development
IS-868	PN-4925	SIM roaming from TIA/EIA-41 (CDMA) to GSM	Development
IS-872	PN-4934	IP core network support for legacy mobiles	Development
IS-873	PN-4935	IP core network support for multimedia terminals	Development
IS-881	**PN-4747**	**Location service enhancements, including security**	**Development**
IS-881	PN-4762	Using IP to transport TIA/EIA-41 messages	Development
IS-884	PN-0013	CDMA IP Requirements and Network Architecture	Development
TIA-906	**PN-0045**	**Secure mode over-the-air service provisioning (OTASP) and parameter administration (OTAPA)**	**Development**
TIA-917	**PN-0054**	**Wireless priority service**	**Development**
	PN-4288	Enhanced Emergency Services (E9-1-1), Phase III: Optional features beyond FCC mandate	On hold
	PN-4393	Enhanced Security (authentication and encryption) for TIA/EIA-41	Development
	PN-4755	Intersystem support for 3G packet data, including simultaneous voice and data	Development
	PN-4926	TIA/EIA-41/CDMA roaming to a GSM network	Development
	PN-4927	Interworking and interoperability (IIF) enhancements to support IS-868	Development

TSG-N Specifications (N.Sxxxx)

Specification	Description	Status
N.S0003	User Identity Module (UIM)	Published 04/01
N.S0004	WIN Phase II	See IS-848
N.S0005	Intersystem Operations	See TIA/EIA-41-E
N.S0006	PCS Multi-band operations	See TSB76
N.S0007	DCCH (Digital Control Channel for TDMA)	See IS-730
N.S0008	Circuit Mode Services	See IS-735
N.S0009	IMSI support in TIA/EIA-41	See IS-751
N.S0010	Advanced CDMA features	See IS-735
N.S0011	OTASP and OTAPA	See IS-725-A
N.S0012	Calling Name Presentation (CNAP) and Restriction (CNAR)	See IS-764
N.S0013	WIN Phase I	See IS-771
N.S0014	Authentication enhancements	See IS-778
N.S0015	**TIA/EIA-41-D miscellaneous enhancements**	**Development**
N.S0016	TIA/EIA-41-D internationalization	See IS-807
N.S0017	International implementations of systems compliant with TIA/EIA-41	See TSB29-C
N.S0017-A	International implementations of systems compliant with TIA/EIA-41	See TSB29-D
N.S0018	Prepaid charging (WIN Phase II)	See IS-826
N.S0019	**Intersystem link protocol (ISLP)**	**See IS-728**
N.S0020	Segmentation and reassembly	See IS-812
N.S0021	User selective call forwarding	See IS-838
N.S0022	**Answer hold**	**See IS-837**
N.S0023	Automatic code gapping (ACG)	See IS-786
N.S0024	MDN-based Message Centers (MC)	See IS-841
N.S0025	Roamer database verification	See IS-847
N.S0026	**Near real-time call detail/billing record transfer**	**See TIA/EIA-124**
N.S0027	Enhanced international dialing, calling number identification, callback and calling party category identification	See IS-875
N.S0028	CDMA IP network requirements and architecture model	See IS-884
N.S0029	Inter-system operations for roaming and mobility	See TIA/EIA-41-F
N.S0030	**Enhanced security services based on AKA**	**See PN-4393**
N.S0032	**Mobile Application Part, Revision F**	**See TIA/EIA-41-F**
N.S0033	**Addendum 2 for Enhanced Emergency Services Phase II**	**See J-STD-036-A**
N.S0034	**Emergency services beyond US FCC mandate**	**See PN-4288**
N.S0035	**Lawfully authorized electronic surveillance**	**See J-STD-025-A**
N.S0036	**Semi-real time call detail and billing record transport**	**See TIA/EIA-124-C**
N.S0038	**Secure Mode OTASP and OTAPA**	**See TIA-906**

TSG-N Projects (N.Pxxxx)

Specification	Project	Description	Status
	N.P-0009	**CDMA Packet Data Service, Phase I**	**See IS-880**
	N.P-0010	**CDMA Packet Data Service, Phase I**	**See PN-4755**
	N.P-0011	**WIN location based services**	**See IS-843**

N.P-0013	**Location services**	**See IS-881**
N.P-0019-A	**Enhancements to VLR roamer database verification**	**See IS-847-A**
N.P-0020	**IP based data transfer services**	**See IS-879**
N.P-0021	**WIN ACG enhancements**	**See IS-786-A**
N.P-0022	**WIN pre-paid charging enhancements**	**See IS-826-A**
N.P-0023	**IP core network - legacy MS domain (LMSD)**	**See IS-872**
N.P-0024	**IP core network - multimedia domain (MMD)**	**See IS-873**
N.P-0025	**CDMA SIM roaming to GSM**	**See IS-868**
N.P-0026	**IIF enhancements for two-way CDMA SIM roaming to GSM**	**See PN-4926**
N.P-0027	**IIF enhancements for one-way CDMA SIM roaming to GSM**	**See PN-4927**
N.P-0029	**TIA/EIA-41-E Integration**	**See TIA/EIA-41-E**
N.P-0030	**Enhanced security services using AKA**	**See PN-4393**
N.P-0032	**TIA/EIA-41-F Integration**	**See TIA/EIA-41-F**
N.P-0033	**Emergency Services Phase II**	**See J-STD-036-A**
N.P-0034	**Emergency Services beyond US FCC mandate**	**See PN-4288**
N.P-0037	**Uniform dialing plan**	**See TIA/EIA-660-A**
N.P-0038	**Secure mode OTASP and OTAPA**	**See TIA-906**
N.P-0039	**Accounting and auditing system requirements**	**See PN-xxxx**
N.P-0040	**Wireless priority service (WPS)**	**See TIA-906**