

**STATEMENT OF CASIMIR SKRZYPCZAK**

**President, NYNEX Science and Technology, Inc.**

**And**

**Vice President - Technology and Network Planning,  
NYNEX Telesector Resources Group**

**And**

**CHAIRMAN OF THE BOARD OF DIRECTORS  
Of The  
EXCHANGE CARRIERS STANDARDS ASSOCIATION, INC.**

**Before The**

**GOVERNMENT INFORMATION, JUSTICE,  
AND AGRICULTURE SUBCOMMITTEE**

**Of the**

**Committee on Government Operations,  
House of Representatives  
Congress of the United States**

**October 2, 1991**

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## **I. INTRODUCTION AND OVERVIEW**

Good morning, my name is Casimir S. Skrzypczak, and I am submitting this statement in my capacity as Chairman of the Board of the Exchange Carriers Standards Association ("ECSA"). I am President - Science and Technology of NYNEX Corporation and Vice President - Technology and Planning in the NYNEX Telesector Resources Group. In this connection, it may be useful to give you my background.

In my present positions at NYNEX, I am responsible for the development and review of technology plans, including long-range technology plans for NYNEX companies, involving evaluation of network architectures and appropriate technical standards and interfaces as well as the latest technologies from vendors.

Prior to this position, I was Vice President - Network Planning of Bell Communications Research, Inc. ("Bellcore"), from January 1983, through August 1985. In that position, I was responsible for assisting the Regional Bell Operating Companies ("RBOCs") in network planning. In that capacity, I provided technical advice and assistance to the RBOCs in the planning and implementation of RBOC network services and network architectures, and advised the RBOCs concerning proposed technical standards.

From December of 1979 through December of 1982, I served as Director - Fundamental Network Planning of AT&T where I was responsible for long-term planning for the evolution of the telecommunications network, and developing planning guidelines,

methodologies and computerized aids for use by Bell Operating Company ("BOC") planners. I also served as the Network Department interface with the Independent Telephone Companies through my contacts with the United States Independent Telephone Association ("USITA"). In this capacity, I was AT&T's liaison with USITA's Network Planning Subcommittee of its Engineering Committee, and with USITA's Equipment Compatibility Committee. USITA's Equipment Compatibility and Engineering Committees brought manufacturers and independent telephone companies together in a forum where questions on standards and interfaces could be addressed. Prior to the AT&T assignments, I held a variety of network planning, engineering, operations and administrative positions in New York Telephone from 1967 through November 1979.

As a result of this background, my involvement in the U.S. standards community and my involvement with ECSA since its inception, I am particularly pleased to have the opportunity to testify on the development of telecommunications technology and standards since the AT&T divestiture, specifically the role that industry, through ECSA and other standards-setting organizations, has played and should continue to play in the standards development process.

I strongly believe that the current private voluntary standards system which has developed - one in which ECSA is a key player - is the most effective and efficient means for achieving standardization, particularly as it relates to the reliability of

telecommunications networks, products, and services. My comments here today will demonstrate several important points: 1) substantive standards development should remain primarily the responsibility of private standards developers while government acts in a cooperative partnership with industry to influence and effectuate global competition; 2) ECSA, through its sponsorship of Committee T1 as a private standards developing Committee and as the coordinator for such interindustry mechanisms as the Carrier Liaison Committee, for prompt problem-sharing and efficient problem-solving, is an effective vehicle to achieve these results; and 3) importantly, and in the context of these hearings, the Network Operations Forum already has underway efforts to improve the reliability of Common Channel Signalling networks under various conditions of network stress.

## II. THE EXCHANGE CARRIERS STANDARDS ASSOCIATION

### A. Background

Those of us who were active in standards development at the time of divestiture recognized that without the ability to rely on the Bell System to ensure compatibility and interoperability of networks and equipment, delivery of first-rate telecommunications service could be severely impacted. We also recognized that we could inhibit the rapid development of new technologies and lose competitive footing in the globalization of telecommunications markets. We were faced with the fact that a new standards-setting environment would be essential, and that it

would have to be one in which cooperation among manufacturers, interexchange carriers, local exchange carriers and users - the marketplace - would exist. With this foresight and a recognized need, we took it upon ourselves to plan and to prepare in anticipation of divestiture in a way that we thought would permit the continued availability of high quality telecommunications service to which we all are accustomed in this country.

From this recognition and this need, we established ECSA in 1983. ECSA is a not-for-profit association of 137 wireline exchange carriers ranging in size from the Regional Bell Operating Companies with millions of access lines to small rural carriers with a hundred or so lines.

Governed by a twenty-one member Board of Directors, ECSA was formed to serve several purposes. First, it provides representation of exchange carrier interests in the spectrum of standards and related technical matters affecting the exchange carrier industry. Second, since February of 1984, it has sponsored and supported Committee T1, a leading United States telecommunications standards-setting organization accredited by the American National Standards Institute ("ANSI") as a consensus mechanism for developing voluntary interconnection standards. Third, in response to the changing environment brought about by equal access, ECSA accepted sponsorship of the Carrier Liaison Committee ("CLC") in 1984 for the discussion and resolution of nationwide problems concerning the provision of exchange access services. Fourth, in 1987, ECSA accepted the request of the

RBOCs to sponsor and support the Information Industry Liaison Committee ("IILC") which facilitates the exchange of information on network capabilities and the development of Open Network Architecture ("ONA") services. Fifth, also in 1987, ECSA undertook sponsorship of the Telecommunications Industry Forum ("TCIF"), a forum to address issues on industry standards such as those for electronic data interchange and bar coding.

Each of these ECSA Committees is a compelling example of the effectiveness of the current voluntary standards system and the successful industry role that ECSA plays in telecommunications problem-sharing and problem-solving.

**B. Private Standards Setting - Committee T1**

First is Committee T1. When we were considering a Committee T1, we researched other standards developing organizations and looked at their success and failure elements. We found that all of the successful standards developers in our industry, as well as other industries, were members of the American National Standards Institute ("ANSI"). ANSI's due process concepts fit our needs precisely. Accordingly, we requested that ANSI sanction our request to become Secretariat of the newly-proposed Committee T1 on Telecommunications. ANSI provided acceptance in 1984 and Committee T1-Telecommunications held its first official meeting commencing its operations under procedures proscribed by ANSI.

Committee T1's specific mission is to develop technical

standards and reports supporting the interconnection and interoperability of networks at external interfaces with end-user systems, other carriers, information and enhanced service providers, and customer premises equipment.

As one of the ANSI-accredited committees developing American National Standards for telecommunications networks, Committee T1 membership is open to all persons with a direct and material interest in its activities. There are four membership interest categories: exchange carriers, interexchange carriers, equipment manufacturers, and users and general interest which includes user groups, professional associations, and agencies such as the Federal Communications Commission ("FCC" or "Commission") and the State Department at the federal level, as well as state level agencies.

From the outset, Committee T1 and its technical subcommittees, now numbering seven, have represented a broad cross-section of the industry (e.g. in addition to exchange carriers such as NYNEX, interexchange carriers such as MCI and AT&T; manufacturers such as Rockwell International, Northern Telecom and AT&T; and members of the user community, including many representatives of the U.S. government) as well as many foreign firms (e.g., Fujitsu, NEC, Siemens, Ericsson and Alcatel) as well as representatives from foreign telecommunications administrations (e.g. British Telecom and the Canadian Standards Association). The Committee currently has 177 members (84 voting members and 93 non-voting members) with the total number of



technical experts participating at all levels of Committee T1 in the range of fifteen hundred.

Most important is the high level of productivity Committee T1 has been able to achieve during its six-year existence. To date, nearly one hundred standards developed by Committee T1 have been approved as American National Standards or are in the approval process. Among these standards are eight American National Standards on Signalling System No. 7 ("SS7") covering the SS7 spectrum, from general information on the technology to transaction capabilities to operations and maintenance. With each of these SS7 standards, the overall objective is to provide an internationally standardized, general purpose, common channel signalling system that provides a reliable means of transfer of information. If it would be informative, I could make this extensive documentation available to you [See Attachment A for a complete listing of the standards.] In addition, nearly two hundred projects continue to be worked on in Committee T1, many of which will also result in American National Standards.

Thus, in its brief existence, Committee T1 has been able to establish a forum where over fifteen hundred experts from all segments of the telecommunications industry cooperatively engage in a consensus process and develop timely technical standards relating to existing and newly-emerging technologies.

Committee T1 has also achieved international preeminence. For example, Committee T1 stands as a model for the Telecommunications Technology Committee ("TTC") in Japan and the

European Telecommunications Standards Institute ("ETSI"). Foreign standards bodies such as the Canadian Standards Association and the Swiss have emulated T1's work by adopting and reproducing T1 standards as their own.

I also must mention the February 1990 Interregional Telecommunications Standards Council meeting convened at the invitation of Committee T1 in Fredericksburg, Virginia. Its purpose was to urge the International Telecommunication Union ("ITU") Administrative Council to consider changes within the International Telegraph and Telephone Consultative Committee ("CCITT") structure to maintain its preeminence as a worldwide telecommunications standards body. These changes included the need for CCITT to give priority to modernization, flexibility, and efficiency of its organization and working methods. Representatives from telecommunications administrations throughout the world attended, including Europe, Japan, Canada, and Australia. A second conference held in mid-September in Nice, France, continues the important work started in Fredericksburg.

Committee T1's effectiveness can be attributed only to the voluntary nature of the current process of standards development as managed by ANSI. Through this process, industry participants are able to define priorities and utilize and allocate resources for achieving specific goals in the most efficient and cost effective manner. What's more, such success reflects T1's effectiveness in managing the flow of critical technical

information to interested parties throughout the industry and globally. In fact, Committee T1, through its technical subcommittee T1S1 on Services, Architecture, and Signalling, has contributed over one hundred and eighty draft U.S. contributions this year alone to the CCITT which, after approval by the U.S. Department of State, become contributions to the ITU.

Given such Committee T1 success, both domestically and internationally, what, if any, should the government's role be in the private standards process; whether it be the FCC, the Department of State, the Department of Commerce, or the United States Trade Representative's Office. As the Chairman of ECSA, and a representative of private industry active in the standards process, it is my view that any administrative or regulatory control over standards developers in the U.S., like Committee T1, is not warranted. We believe that "the current private voluntary standards process administered by ANSI is the most sound, efficient and effective means for achieving essential standardization, particularly as it relates to telecommunications products and services." ECSA made this point before the Department of Commerce National Institute of Standards and Technology hearings on improving U.S. participation in international standards activities in April 1990. We continue to believe and support this position.

Any movement to increase government involvement or any change in direction mandated by governmental authority would unnecessarily compromise the effectiveness of industry committees

such as T1, and potentially redirect their efforts to projects deemed important from a government perspective, rather than as demanded by the marketplace. This would especially be true if standards developers were made dependent upon the government for funding. Political or bureaucratic in-fighting could be rife and budgetary constraints devastating, all to the detriment of the standards process. For these reasons, I believe it would be a mistake if any effort were undertaken to redesign the domestic standards infrastructure so that greater government control could occur.

However, the government does have a valuable role to play relative to standards, and its role can be enhanced. In fact, the government already plays an important role in the development of voluntary standards. For example, as one of the largest consumers of telecommunications products and services, the government has great influence on the direction of standards development. It can be seen in Committee T1, where such agencies as the Department of Defense and the National Telecommunications and Information Administration are regular participants. Committee T1 has sought and continues to seek formal liaison with the FCC as technical issues warrant, and provides input to the Commission, as appropriate, while the FCC monitors the standards work by receiving all documentation on a monthly basis. ECSA believes that this kind and level of involvement is an important and useful role for the government to take in private industry activities. It is one that should be reaffirmed and be

continued.

Another important role for the government to have is with respect to the increasingly-competitive global markets. There is a critical need for the government to ensure and to enhance the ability of domestic firms to compete in world markets. This means that we must consider how the efforts of government and those of the private sector can best be coordinated so that foreign markets are accessible and free from artificial trade barriers. ECSA sees the answer being in the establishment of a partnership between government and the private sector. Substantive technical standards development should remain the responsibility of private sector standards developers. The government should use its influence to ensure that the private sector's products -- such as Committee T1-developed standards -- are accessible to all world markets. This division of responsibility would serve U.S. interests and make U.S. industry an even stronger competitive force throughout the world.

Any government initiative should be targeted to ensure U.S. industry's competitive success in the global marketplace and afford a level competitive playing field throughout the world. Foreign markets must be made free of trade barriers for U.S. products and services and complete international transparency of standards must be achieved. Such efforts will require both greater coordination among the various government agencies involved in standards and trade issues and better communication between the private sector and such government agencies. ANSI

could serve an important function in this endeavor as it already serves as a coordinator for the voluntary standards developers that operate under its auspices.

In short, the effectiveness of private industry standards development is well supported. Committee T1 serves as just one example. ECSA believes that no steps should be taken to inhibit or hinder these efforts. Rather, a coordinated effort between government and industry would maximize opportunities for all.

**C. Interindustry Problem Solvers - The Carrier Liaison Committee, The Information Industry Liaison Committee and The Telecommunications Industry Forum**

While Committee T1 is a proven effective arena for voluntary standards setting by industry, ECSA also provides other viable interindustry mechanisms for problem sharing and solving with respect to technical and related telecommunications issues. They are its three interindustry committees -- the CLC on exchange access, the IILC on ONA and the TCIF on electronic data interchange and alternative technologies. As with Committee T1, participants in these Committees represent the broad spectrum of industry players, including exchange and interexchange carriers, manufacturers, enhanced service providers, vendors, and end users. While the "product" of these Committees might not be characterized as formal standards per se as with Committee T1, they do represent significant industry effort and cooperation to identify technical and operational network problems, exchange information on these problems and seek consensus resolution of

the problems in a timely manner. As I will detail here, they also have proven to be a successful means of addressing critical network issues.

The first of these Committees is the CLC. Proposed by ECSA in September 1984, and endorsed by the FCC in January 1985, the CLC was established to provide interindustry mechanisms for the discussion and voluntary resolution of nationwide concerns regarding exchange access ordering, provisioning, installation, repair, maintenance, billing, and administration. The CLC serves as an umbrella for three associated industry forums: (1) the Industry Carriers Compatibility Forum ("ICCF"), which addresses technical exchange access interconnection issues such as carrier identification codes and automatic number identification; (2) the Network Operations Forum ("NOF"), which deals with installation, maintenance and testing issues associated with providing exchange access, currently including issues associated with mass media stimulated calling events and SS7; and (3) the Ordering and Billing Forum ("OBF"), which addresses issues concerning the ordering, provisioning and billing of access services, including ONA.

The CLC and its associated forums address and attempt to resolve issues based on a somewhat less structured process than that of Committee T1. Resolution of issues is achieved by consensus. Thus, while a proposed resolution of a specific issue may not be a participant's first choice, an effort is made to determine whether it is one that the participant can accept and

support, with significant opposition to a proposal usually stopping the resolution process. Each participant has committed to discuss issues and consider proposed resolutions in good faith.

The bulk of the CLC's technical work is done in its three associated forums -- the ICCF, the OBF, and the NOF. Each one of these forums is structured to be responsive to and resolve national technical issues in the various aspects of the equal access environment. For example, the Industry Carriers Compatibility Forum, -- the ICCF provides a forum for network interconnection issues with participants coming primarily from exchange and interexchange carriers. More recent issues have tapped the operator service providers, cellular mobile carriers and radio common carrier pagers. Since 1983, ICCF has addressed such issues as echo control, carrier identification codes where work is ongoing, and SS7 interconnection issues.

The Ordering and Billing Forum -- the OBF, established in 1985, is the largest of the Forums and provides evidence of the successes that can flow from industry addressing industry's technical problems. The OBF's activities focus on ordering, provisioning, and billing of access services. During 1989, the OBF's activities were expanded to include non-access issues, such as message exchange requirements as driven by new services such as SS7 and ONA. The OBF regularly attracts three hundred participants and accomplishes its mission through six working committees covering such services as billing, subscription, and



800 database. Most telling of the significant OBF successes is its track record on the number of issues resolved in its six-year existence. The OBF has initiated over seven hundred issues and reached consensus on over six hundred of them.

Chartered in August 1984, the Network Operations Forum -- the NOF, is a working forum for the identification, discussion and resolution of nationwide issues concerning the installation, testing and maintenance of exchange access services. The NOF concentrates on developing and maintaining a number of working manuals such as the Installation and Maintenance Operations Reference Document, an industry administrative operations generic reference to facilitate interexchange and exchange carrier administrative and operational relationships; the Testline Guidelines & Coordinator Directory which provides interexchange carriers and exchange carriers with Testline Coordinator contacts; the Network Management Guidelines & Contact Directory to facilitate exchange carrier and interexchange carrier communications and relations; and the 800/900 NXX Trouble Look Up Table.

Of particular import is the NOF's most recent publication of the SS7 Link and Trunk Installation & Maintenance section of the Installation and Maintenance documents, and the Catastrophic SS7 Network Failure/Restoration Contact Directory. These NOF undertakings are most timely with respect to the SS7 network outages. In fact, as a result of the recent SS7 outages and its experience in this area, the NOF is expanding the scope of its

work and pursuing industry discussions on SS7 integrity assurance. This two-day workshop, currently underway in Alexandria, Virginia, is designed to share the views and experience of carriers and equipment manufacturers and has the goal of improving the reliability of Common Channel Signalling ("CCS") networks under various conditions of network stress. More than seventy (70) exchange carriers, interexchange carriers, equipment manufacturers, software vendors, and end users have indicated that they plan to attend. Among the issues to be discussed are potential network vulnerabilities, selection of protocol options and protocol performance objectives and emergency communications during a service outage. We believe it will provide an avenue to exchange information and examine issues on the continued reliability of the CCS network (See Attachment B for the meeting announcement and agenda).

In its relatively brief history, the NOF has successfully addressed more than one hundred operations issues and developed the important documentation described above to assist the industry in implementation of these consensus resolutions. Of significance is the fact that the NOF has been addressing SS7 and related issues since 1988. (See Attachment C for NOF Issue Status Report) The NOF, through its industry participants, has been and continues to be proactive in its efforts to deal with SS7, from the time of the technology's development through its deployment, and as maintenance and operations issues arise. In this connection, the industry, via the NOF, has been able to go

through its SS7 learning curve and now is able to turn to the NOF with real problems and seek real solutions as SS7 is being deployed.

The NOF also has demonstrated its ability to provide prompt resolution to operations issues. For example, the NOF published its first issue of the SS7 Link & Trunk Installation Maintenance Document in June 1991. Just two months later, the NOF published the second issue of the document, incorporating important amendments to the text based on industry experiences with SS7. Of import is the fact that an outline of the documentation has existed and been available to the industry since 1988 when the first SS7 issues were introduced into the NOF process. As the NOF resolves issues, the resolution becomes part of NOF documents, with the industry reaching agreement on all documentation language. However, resolutions to issues are effective and available when the industry closes the issues.

As you may know, ECSA participated in the FCC's September 12, 1991, inter-industry meeting on network reliability. At that meeting, it was recognized by both the FCC and the industry that the NOF has an important role to play in sharing network reliability information. Specifically, as a result of the FCC meeting, the NOF has undertaken defining what a service outage is, when outages should be reported to others in the industry and to whom such reports will be made. In fact, the NOF is in session on these critical issues today, and will report to the FCC and the industry with respect to the progress as soon as

possible.

The NOF's ability to address diverse technical/operations concerns also can be seen in its undertaking of those issues identified by Bellcore's Media Stimulated Calling Working Committee with respect to mass media stimulated calling events. The NOF will be the prime focus for industry input triggered by mass media stimulated calling events on such issues as the need for historical data, streamlining notification of such events between exchange carriers and interexchange carriers, and call gapping -- an NOF issue already in existence.

As can be seen in these activities alone, the industry has initiated both a structure and a process that identifies critical network problems, shares information on these problems and resolves them -- all with the appropriate technical expertise. ECSA believes that with a vehicle such as the NOF in place to address and debate operations issues, the results are and will continue to be sound technical industry practices representing the best thinking of the industry as a whole. While somewhat different from the more formal standards-setting process of a Committee T1, ECSA also believes that this process is efficient, is flexible and is responsive. I believe that our effectiveness with this process has achieved recognition within the industry and is supported by the industry.

As to whether or not there is a role for government to play in this process, ECSA reaffirms its position that a well defined, partnership and interface is the best way for the government and

the private sector to interact in this setting as well. In the CLC arena, we already have an established history of operating in a cooperative government/industry partnership with the FCC. The Commission has endorsed the CLC itself and has referred certain issues to the CLC. One such example is the CLC's involvement with the operator service provider industry segment. In keeping with one of the CLC's key principles -- to ensure the availability of appropriate forums and to address the concerns of an emerging operator service providers industry -- the CLC established the Operator Service Providers Committee ("OSPC") on an interim, ad hoc basis in September 1988.

Recognizing the CLC's involvement with this new industry segment, the FCC released a Memorandum Opinion and Order in a complaint proceeding in February 1989, directing five defendant operator service providers ("OSPs") to bring the technical issue of call splashing before the CLC. A Task Force was established immediately to prepare a report for the FCC's Enforcement Division in June 1989. The report contained a comprehensive discussion of the definition of the call splashing, the reasons for it, as well as the potential solutions and their impacts. The Task Force completed its mission upon filing of its report with the FCC in three months. ECSA also kept Congress apprised of its work on this issue.

Another example of a problem identified by the FCC and referred to the industry is the issue of blocking between end offices and access tandems. This was one of five issues raised

in 1986 regarding the design of Feature Group D access on which the FCC sought further study by the CLC for purposes of their monitoring the progress of equal access implementation. Exactly one month after the FCC requested the CLC's assistance, the CLC reported to the Commission that the industry had reached consensus that the first step was to provide useful data on trunk blocking performance. What followed were two additional reports to the FCC and a consensus resolution by the industry. The issue of blocking data availability was closed in just over four months after the CLC had been asked to address the matter.

Other examples of FCC-referred issues exist. The CLC and the OBF have been addressing meet-point billing of access services as directed by the Commission since 1985, with annual reports being sent to the FCC on the industry's progress. Toll fraud prevention issues also have been important to the FCC. The NOF's Toll Fraud Prevention Committee recently met with the Commission to indicate what the industry is doing to prevent this significant problem. The list goes on.

ECSA's Information Industry Liaison Committee -- the IILC -- demonstrates still another area where industry-generated initiatives with FCC endorsement and cooperation have proved successful. As the Regional Bell Operating Companies initiated discussions on open network architecture and related services with the non-exchange carrier industry, it became clear that there was a need for an interindustry mechanism whereby interested parties could discuss and resolve industry-wide

concerns about the provision of ONA services. In October 1987, ECSA agreed to support this process and the IILC was chartered as one of its Committees. The IILC's goal is to facilitate the exchange of information on network capabilities and the development of ONA services. Like the CLC in its processes, the IILC strives for industry consensus on issues associated with the provision of ONA services.

The FCC is a regular participant at meetings and monitors the work and the progress of the IILC. In its review of the BOC ONA plans, the Commission has said that "the IILC is successfully accommodating the varying industry groups concerned with ONA." ECSA believes that the IILC continues to demonstrate its effectiveness as a forum where ONA issues can be addressed and resolved under the consensus resolution process in an efficient fashion while the government takes an appropriate monitoring role.

The last of the three ECSA interindustry mechanisms is the Telecommunications Industry Forum -- the TCIF. Modeled after Committee T1's organization and procedures, the purpose of TCIF is to provide a forum for purchasers, manufacturers, and suppliers of telecommunications equipment, products, and services to address issues related to existing industry standards such as electronic data interchange and new technologies such as bar coding. It, too, is open to all parties with a direct and material interest in its activities.

While there has been no government involvement in the TCIF's

activities, ECSA has recognized this industry-led activity as important, both domestically and internationally, as there is an increased demand for more efficient means to communicate and conduct business.

What is clear is that ECSA's interindustry, consensus resolution Committees have worked in successful cooperation with the FCC for a number of years, receiving both industry and FCC endorsement. We believe that this is an effective relationship between government and industry -- one that should not be altered.

### III. CONCLUSION

We, ECSA, are aware of the seriousness of the recent SS7 outages and the magnitude of the implications for subscribers, for the network and for the industry.

You, Congress, have a very keen interest in seeing the integrity of the telecommunications network to provide reliable and efficient service to the public assured and preserved.

ECSA believes that these concerns can be resolved efficiently and that these interests can be protected effectively in a cooperative private sector/government partnership. Further, ECSA believes that it has the processes to undertake this endeavor and achieve these goals - whether the need is to set standards or resolve technical issues. The complexities of the network do not offer up easy solutions. However, I am confident that the industry, through ECSA and the Committees that it



sponsors, can effectively and efficiently consider a wide variety of telecommunications issues and can promote innovative responses to those issues involving telecommunications facilities, services, and equipment in a timely manner.

-END-

**Signalling System No. 7 Standards  
Approved by ANSI and Published**

The following SS7 Standards have been developed by Committee T1, and the American National Standards Institute:

- ♦ Signalling System No. 7, General Information (ANSI T1.110-1987)
- ♦ Signalling System No. 7, Message Transfer Part (ANSI T1.111-1988)
- ♦ Signalling System No. 7, Signalling Connection Control Part (ANSI T1.112-1988)
- ♦ Signalling System No. 7, ISDN User Part (ANSI T1.113-1988)
- ♦ Signalling System No. 7, Transaction Capabilities (ANSI T1.114-1988)
- ♦ Monitoring and Measurements for Signaling Systems No. 7 Networks (ANSI T1.115-1990)
- ♦ Signaling Systems No. 7 Operations, Maintenance and Administrative Parts (ANSI T1.116-1990)
- ♦ Interworking Between the ISDN User-Network Interface Protocol and the Signaling System No. 7 ISDN User Part (ANSI T1.609-1990)

Moderator, Rick Harrison  
Secretary, Art Walsh

Room 4E201  
290 W. Mt. Pleasant Avenue  
Livingston, N.J. 07039



Network Operations Forum

August 6, 1991

To Industry Participants:

*As a result of the recent SS7 related service outages, the Network Operations Forum, SS7 Workshop has agreed to expand the scope of its work and pursue open industry discussions surrounding the topic of SS7 Integrity Assurance. The Workshop is eliciting the views and experience of carriers and equipment manufacturers, with the goal of improving the reliability of CCS networks under various conditions of network stress. Drawing on the collective expertise of its participants, the SS7 Workshop will provide an avenue to exchange information and examine issues relative to continued reliability of the CCS network.*

*Attached is a meeting announcement and the agenda for the October 2 & 3, 1991 SS7 Workshop. We have allocated specific time on the agenda to discuss SS7 Integrity Assurance. In order to facilitate discussion, the following concerns have been suggested, for your consideration:*

**Network failure scenarios - potential vulnerabilities**

**Selection of protocol options (e.g. timers) within standards and requirements**

**Enhancements to CCS network architecture and protocols**

**Additional protocol performance objectives**

**Interconnection considerations - congestion, emergency communications, etc.**

**Operations recommendations for minimizing outages**

*The objective of this discussion is to identify if concerns are already addressed by existing NOF issues and to develop new issues, where necessary, if they are not. Attached is a blank NOF Issue Identification Form.*

*I look forward to meeting you and for your input. The NOF has a successful track record in solving industry operational problems and documenting guidelines and procedures for use by interconnecting networks. With your help we hope to continue that success.*

Sincerely,



Rick Harrison  
NOF Moderator

**NETWORK OPERATIONS FORUM (NOF)  
INSTALLATION, TESTING AND MAINTENANCE COMMITTEE (ITM)  
MEETING ANNOUNCEMENT  
HOSTED BY: US TELEPHONE ASSOCIATION**

**Date:** *October 1, 1991*

**Times:** *8:00 a.m. - 5:00 p.m.*

**Where:** *The Embassy Suites Hotel-Alexandria  
1900 Diagonal Road  
Alexandria VA. 22314  
(703)-684-5900*

\*\*\*\*\*  
**RESERVATION DEADLINE: September 15, 1991**  
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**Reservation:** *Please contact the hotel direct on 703-684-5900 and mention you will be attending the Network Operations Forum, hosted by the USTA, to receive a room rate of \$119.00 per nite (single or double).*

**Transportation: METRO:** *Take the Yellow line toward Huntington. Two (2) stops to KING ST. Exit at King St., hotel is directly across the street. (Metro cost \$1.05). TAXI: Approximately \$10. - \$15.00, depending on rush hour traffic.*

To ensure adequate accommodations for the meeting, attendees are requested to contact Art Walsh, NOF Secretary, on 201-740-4313 or 201 740-3674, after making hotel arrangements.

**Questions:** *Please contact Art Walsh, NOF Secretary on 201-740-4313.*

**NOTE:** *This notice is being reissued to correct the Hotel contact telephone number from 703-684-1403 to 703-684-5900.*

**NETWORK OPERATIONS FORUM (NOF)**  
**INSTALLATION, TESTING AND MAINTENANCE COMMITTEE (ITM)**  
**PROPOSED AGENDA**  
**HOSTED BY: US TELEPHONE ASSOCIATION**

(Tuesday 10/1/91) - 8:00 A.M. to 5:00 P.M.

**7:30 A.M. Continental Breakfast**

**8:00 A.M. Opening.....Gary Beohmerle**

**Review of Open Issues .....Gary Beohmerle/Dave Michael**

*Issue #098 - Flash on Unanswered Calls*

*Issue #113 - Using NCTE for Acceptance and Maintenance*

*Issue #115 - Network Management - Call Gapping*

*Issue #122 - Announcements for Unassigned/Disconnected 800 NXX Lines*

*Issue #124 - Prior Notification of Media Stimulated Calling Events*

*Issue #130 - DS-1 Services Riding DS-3 Interface or DS-1 Service on DS-1 Interface - Chronic Troubles*

*Issue #131 - 800/900 Call Blocking Data*

*Issue #132 - 800/900 Routing Verification*

*Issue #133 - 800/900 New Translation Code Test Requirements-Multi EC Environment*

*Issue #134 - Switched Digital Data Testing*

*Issue #135 - Interconnection Testing - ISDN Service*

**New Business**

**Next Meeting Agenda**

**5:00 P.M. Adjourn**

**NETWORK OPERATIONS FORUM (NOF)**

**SS7 WORKSHOP**

**MEETING ANNOUNCEMENT**

**HOSTED BY: US TELEPHONE ASSOCIATION**

**Date:** *October 2 - 3, 1991*

**Times:** *October 2, 1991*  
*8:00 a.m. - 12.00 p.m. (Regular SS7 Workshop)*  
*1:00 p.m. - 5:00 p.m. (SS7 Integrity Assurance)*

*October 3, 1991*  
*8:00 a.m. - 12:00 p.m. (SS7 Integrity Assurance)*

**Where:** *The Embassy Suites Hotel-Alexandria*  
*1900 Diagonal Road*  
*Alexandria VA. 22314*  
*(703)-684-5900*

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**RESERVATION DEADLINE: September 15, 1991**  
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**Reservation:** *Please contact the hotel direct on 703-684-5900 and mention you will be attending the Network Operations Forum, hosted by the USTA, to receive a room rate of \$119.00 per nite (single or double).*

**Transportation: METRO:** *Take the Yellow line toward Huntington. Two (2) stops to KING ST. Exit at King St., hotel is directly across the street. Metro cost \$1.05.*  
**TAXI:** *Approximately \$10. - \$15.00, depending on rush hour traffic.*

**To ensure adequate accommodations for the meeting, attendees are requested to contact Art Walsh, NOF Secretary, on 201-740-4313 or 201 740-3674, after making hotel arrangements.**

**Questions:** *Please contact Art Walsh, NOF Secretary on 201-740-4313.*

**NOTE:**

*Recent SS7 related outages have raised some new concerns in the industry. As a result, the SS7 Workshop has agreed to expand the scope of its work and is allocating the afternoon of October 2 and the morning of October 3, for open discussion surrounding the topic of SS7 Integrity Assurance. This will allow the equipment manufacturers and other interested parties better scheduling flexibility to attend just this part of the meeting. However, participation at all NOF meetings is open to all interested parties.*

**NOTE:** **This notice is being reissued to correct the Hotel contact telephone number from 703-684-1403 to 703-684-5900.**

**NETWORK OPERATIONS FORUM (NOF)**

**SS7 WORKSHOP**

**PROPOSED AGENDA**

**HOSTED BY: US TELEPHONE ASSOCIATION**

*(Wednesday 10/2/91) - 8:00 a.m. - 12:00 p.m. (SS7 Workshop meeting)  
1:00 p.m. - 5:00 p.m. (SS7 Integrity Assurance)*

*7:30 A.M. Continental Breakfast*

*8:00 A.M. Opening.....Gary Beohmerle*

*Review of Open Issues.....Gary Beohmerle/Norb Lucash*

*Issue # 119 - Acceptance of Network Management Messages Across Network Boundaries*

*Issue # 121 - STP Gateway Screening for Interconnecting Networks*

*Issue # 127 - Compatibility Tests Severity Criteria - SS7 Interconnection*

*Issue # 128 - Emergency Communications*

*Issue # 129 - SCCP Routing/Management Control Tests*

*SS7 Integrity Assurance*

**New Business**

**5:00 P.M. Adjourn**

ISS NO.	ISSUE TITLE	ASSIGN	STATUS	NOTE	MOD DAT
001:	Advance Agreement on Responsibilities	S&F	Closed		9/22/89
002:	Communications #A	S&F	Closed	Ref. Iss. 001	1/9/90
003:	Communications #B	S&F	Closed	Ref. Iss. 001	1/9/90
004:	Pre-planning for SS7 Network Failures	S&F	Closed		9/22/89
005:	800 Network Management	S&F	Withdrawn	Non-Issue	7/21/88
006:	Vacant				
007:	Post Gateway	SS7	Withdrawn		7/23/91
008:	Documentation for SS7	ITM	Closed		4/11/89
009:	Test Access for SS7	ITM	Withdrawn		4/24/90
010:	Availability of Transmission Characteristics	ITM	Closed		1/9/90
011:	SS7 Synchronization specifications	ITM	Closed		1/9/90
012:	SS7 Test-Scripts Procedures	ITM	Withdrawn		4/11/89
013:	Timer Setting/Default for SS7	ITM	Closed		1/9/90
014:	Generic Upgrade Procedure for SS7	ITM	Withdrawn	Ref.#021.#029	4/11/89
015:	Alarm Reporting Procedures for SS7	ITM	Withdrawn		4/11/89
016:	SS7 Network and Trouble Reporting Procedures	SS7	Closed		9/25/90
017:	SS7 Network Administration Procedures	ITM	Withdrawn	Ref.to OBF	7/26/89
018:	SS7 Installation Procedures	SS7	Closed		7/23/91
019:	SS7 Network Management Procedures	SS7	Closed		7/23/91
020:	SS7 Network W/Multi ECs	SS7	Closed		9/25/90
021:	SS7 Inter-Network Testing	SS7	Closed		9/25/90
022:	SS7 Correlation of SS7 Trouble Reports/W the Signalling Network	ITM	Withdrawn		7/26/89
023:	SS7 Killer Trunk Procedures	ITM	Closed		4/24/90
024:	SS7 Trunk Trouble Reporting	ITM	Withdrawn	Ref.#022	
025:	SS7 Trunk Numbering Plans	ITM	Closed	Ref.to OBF	1/10/90
026:	SS7 Trunk Alarm Reporting Procedures	ITM	Withdrawn		4/12/89
027:	SS7 Trunk Installation and Acceptance Procedures	SS7	Closed		7/23/91
028:	Inband to SS7 Trunk Conversion Procedures	SS7	Closed		9/25/90
029:	SS7 Trunk Rearrangements Procedures	SS7	Closed	ref.to OBF	2/27/91
030:	SS7 Trunk Network Management Procedures	S&F	Closed		9/22/89
031:	SS7 Trunk Multi EC Procedures	SS7	Closed		9/25/90
032:	SS7 Trunk Inter-Network Testing Procedures	SS7	Withdrawn		4/24/90
033:	SS7 Trunk Switching Translations Procedures	ITM	Withdrawn		7/27/89
034:	Telecommunication Service Priority	ITM	Closed		1/9/90



ISS NO.	ISSUE TITLE	ASSIGN	STATUS	NOTE	MOD DA.
035:	Remote Loopback Devices				
036:	Disconnect Timing	ITM	Closed		8/17/88
037:	Call Waiting	ITM	Closed		8/17/88
038:	Trunk Numbering	ITM	Closed	ACT-ICCF	1/9/90
039:	ESF Digital Testing	ITM	Closed		8/17/88
040:	Switched Access Software Services	ITM	Closed	Pending DTW	1/9/90
041:	Synchronization	ITM	Withdrawn		2/26/91
042:	Emergency Call Trace	ITM	Closed		1/9/90
043:	Envelop Delay Distortion Test Methods	ITM	Closed		8/17/88
044:	IC Trouble Referral Time	ITM	Closed	Pending DTW	9/25/90
045:	Involved EC Reports	S&F	Closed		9/22/89
046:	Out of Band Data Base Troubles	S&F	Closed		1/9/90
047:	IC Trouble Referral	S&F	Closed		4/24/90
048:	Non-Involved EC Trouble Referral	S&F	Withdrawn	Non-Issue	1/10/89
049:	800 Directory Assistance	ITM	Closed		9/25/90
050:	EC Non Participation	S&F	Closed		4/24/90
051:	Misdirected Trouble Reports	S&F	Closed	On Hold	1/9/90
052:	Trouble Reporting Transition Plan	S&F	Closed		1/10/89
053:	900 Service Call Through Test Number	S&F	Closed		4/24/90
054:	900-NXX Trouble Reporting	S&F	Closed		8/16/88
055:	Recorded Announcement for No Trunk	S&F	Closed		8/16/88
056:	IEC Recorded Announcements Suffixes	S&F	Closed		4/24/90
057:	LEC Recorded Announcement (No Wink)	S&F	Withdrawn		1/10/89
058:	LEC Recorded Announcement (All Trunk Busy)	S&F	Closed		1/10/89
059:	Impact of clarification of ASC concept on NOF document Sp Acc, WATS & Sw'd Acc FG A, Sect 10 (Issue 4, Draft 2) and Sw'd Acc FG B, C, D, Sect 8 (Issue 3, Nov. '87)	ITM	Closed		1/9/90
060:	Implementation of New Technical requirements for Switched Exchange Access				
061:	Acceptance Testing POT to EO	ITM	Closed		4/24/90
062:	Interface Standard for 64kbit	ITM	Closed		1/9/90
063:	Testline Directories	ITM	Withdrawn		1/11/89
			Closed		9/22/89

ISS NO.	ISSUE TITLE	ASSIGN	STATUS	NOTE	MOD DA
064:	800 Directory Assistance	S&F	Withdrawn		4/12/89
065:	800 Database Trouble Reporting Procedures Required	S&F	Closed		9/22/89
066:	Digital Stress Testing - DS-1 Level	ITM	Closed		1/9/90
067:	End Office/SSP Call Treatment on Invalid CIC	S&F	Closed		4/12/89
068:	Special Information Tones (SIT)	S&F	Not accepted		3/21/89
069:	Glare Convention	ITM	Closed		9/22/89
070:	Assignment of Signaling Link Control	ITM	Closed	See B.S.Doc 2.1	9/22/89
071:	Assignment of Signaling ISDN-UP Trunk Control Office	ITM	Closed		4/11/89
072:	Time of Day Timing for SS7	SS7	Closed		2/27/91
073:	SS7 Links TSP	ITM	Closed	Ref.to OBF	9/22/89
074:	Identification of SS7 Links	ITM	Withdrawn	Ref.to OBF	7/27/89
075:	Universal EC-IC TL Access Numbering Plan	ITM	Closed		9/22/89
076:	Lineside Call Thru Testing Response	ITM	Closed		8/2/89
077:	Intelligent NCTE	ITM	Closed		6/15/90
078:	ANI of Lines(s) Making Call Thru Tests	ITM	Closed		1/9/90
079:	SS7 Network Element Acceptance Testing	ITM	Withdrawn		4/24/90
080:	Acceptance Testing and Maintenance Parameters/Criteria for SS7 Links	SS7	Active		7/26/89
081:	Acceptance Testing Levels for Link Completion/Turnup	SS7	Closed		9/25/90
082:	SS7 Inter-Network Connection Testing Procedures	SS7	Closed		7/23/91
083:	Changeout of E&M Channel Units when Converting to SS7	SS7	Closed		7/23/91
084:	SS7 Continuity-Check for Message Trunks	ITM	Closed		4/24/90
085:	800 Database Operator Assistance Procedures	ITM	Withdrawn		4/24/90
086:	Link Set Number Requirements	SS7	Closed	Ref.to OBF	7/23/91
087:	Emergency Communications Capabilities for SS7 Failures	SS7	Closed		9/25/90
088:	Trouble Referral/Testing Procedures for Connection Set Up Time	ITM	Closed		1/9/90
089:	Routing Verification for CIC Code Openings	ITM	Closed		1/9/90
090:	800/900 Routing Verification Call Thru Tests	ITM	Closed		1/9/90
091:	Long Term 800 Data Base Testing	ITM	Closed		4/24/90
092:	SS7 Compatibility Test Requirements	SS7	Closed		9/25/90
093:	DS-1 Loopback Devices	ITM	Closed	HIGH	4/24/90
094:	Acceptance of DS-1 Service Within Existing DS-3 Service	ITM	Closed	HIGH	9/25/90
095:	Responsible Organization Operations Responsibilities	SS7	Closed		4/24/90
096:	Switched Access Service Maintenance for DS-1	ITM	Closed		9/25/90

ISS NO.	ISSUE TITLE	ASSIGN	STATUS	NOTE	MOD DATE
097:	NOF Document Glossary Update	ITM	Closed		4/25/90
098:	Flash on Unanswered Calls	ITM	Active		2/13/90
099:	Operational Requirements for SS7 Link Diversity Assurance	SS7	Closed		9/25/90
100:	Vacant				
101:	Catastrophic SS7 Net. Failure/Restoration Broadcast/SS7 Contact Dir	SS7	Closed		7/23/91
102:	CCS Individual POP Serving Multiple Switches	SS7	Closed		9/25/90
103:	Vacant				
104:	Development of Text on 800 Service for NOF Document	ITM	Closed		9/25/90
105:	Manual Call Gapping 800-900 NXX/Data Base	ITM	Closed		9/25/90
106:	SS7 ISUP Testing	SS7	Closed		2/27/91
107:	SS7 Testing - Signalling Control Compatability Part (SCCP)	SS7	Closed		7/23/91
108:	Tones and Announcements in SS7 Environment	SS7	Closed		2/27/91
109:	Testing in a 800 Data Base Environment	ITM	Withdrawn		2/26/91
110:	Responsible Organization ID 800 Data Base Transitional	ITM	Closed		2/26/91
111:	800NXX/Data Base End Office Test Access Capability	ITM	Closed		2/26/91
112:	Operational SPOI Definition	SS7	Closed		2/27/91
113:	Using NCTE for Acceptance and Maintenance	ITM	Active		9/25/90
114:	800 Data Base Disconnect Referral Announcements	ITM	Closed		7/23/91
115:	Network Management - Call Gapping	ITM	Active		10/31/90
116:	Resp Org Responsibilities - 800 Data Base	ITM	Closed		7/23/91
117:	Trouble Reporting During Resp Org Changes	ITM	Closed		2/26/91
118:	800 Data Base National Test Number Availability	ITM	Closed		7/23/91
119:	Acceptance of Net. Mgmt. Messages Across Network Boundaries	SS7	Active		11/1/90
120:	Net. Mgmt. Associated w/Network Interconnect (TCAP)	SS7	Closed		7/23/91
121:	STP Gateway Screening for Interconnecting Networks	SS7	Active		2/27/91
122:	Announcements for Unassigned or Disconnected 800 NXX Lines	ITM	Active		2/26/91
123:	800 Data Base National Test Number Availability	ITM	Closed		7/23/91
124:	Prior Notification of Media Stimulated Calling Events	ITM	Active		2/26/91
125:	Simplification of AMI/88ZS Line Code Verification	ITM	Closed		7/23/91
126:	Interconnecting Net.(ICN) Identification in NOF Proc.	SS7	Closed		7/23/91
127:	Compatibility Tests Severity Criteria - SS7 Interconn.	SS7	Active		4/10/91
128:	Emergency Communications	SS7	Active		4/10/91
129:	SCCP Routing Management Controls Tests	SS7	Active		6/5/91
130:	DS1 Service Riding DS3 Interfaces or DS1 Service on DS1	ITM	Active		6/6/91
131:	800/900 Call Blocking Data	ITM	Active		6/6/91

ISS NO.	ISSUE TITLE	ASSIGN	STATUS	NOTE	MOD DAT
132:	800/900 Routing Verification	ITM	Active		6/6/91
133:	800/900 New Translation Code Test requirements-Multi EC	ITM	Active		7/23/91
134:	Switched Digital Data Testing	ITM	Active		7/23/91
135:	Inter Connection Testing - ISDN Service	ITM	Active		7/23/91