



Exchange Carriers
Standards Association

*Problem Solvers to the
Telecommunications Industry*

December 17, 1991

5430 Grosvenor Lane
Bethesda, Maryland 20814-2130
301 564-4505

Casimir S. Skrzypczak
Chairman
NYNEX Corporation

Frank D. Reese
Vice Chairman
North Pittsburgh Telephone Co.

Gregory L. Theus
Treasurer
GTE Telephone Operations

George L. Edwards
President
ECSA

Susan M. Miller
Secretary
ECSA

Mr. Joseph Shoemaker
Professional Staff Member
House of Representatives
Government Information Subcommittee
B349C Rayburn House Office Building
Washington, D.C. 20515

Dear Joe:

Enclosed please find a copy of the most recent report of the Network Operations Forum's ("NOF") activities on SS7 network integrity. I am also enclosing the full set of NOF minutes which document the NOF activities with respect to its work on SS7 network integrity issues.

If you have any questions or would like to discuss this matter further, please do not hesitate to call me at (301) 564-5160.

Have a good holiday.

Sincerely,

Susan M. Miller
Secretary and
General Counsel

SPONSORED COMMITTEES

COMMITTEE T1-TELECOMMUNICATIONS

CARRIER LIAISON COMMITTEE

TELECOMMUNICATIONS INDUSTRY FORUM

INFORMATION INDUSTRY LIAISON COMMITTEE

STANDARDS COMMITTEE 05

PROTECTION ENGINEERS GROUP

Enclosures

December 11, 1991

Exchange Carriers Standards Association

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The Honorable Robert Wise
House of Representatives
Government Information, Justice,
and Agriculture Subcommittee
Committee on Government Operations
B-349-C Rayburn House Office Building
Washington, D. C. 20515

Dear Congressman Wise:

I want to update you on the activities of the Network Operations Forum (NOF) concerning SS7 network integrity.


Since I wrote you October 23, the NOF has met in plenary session to review the status of all issues, and working groups are meeting regularly to focus on resolving individual issues. Ultimately, the Network Operations Forum will meet in plenary session to reach consensus resolution on the SS7 issues. Issues resolved through consensus (i.e., closed issues) generally are published in one or more operational guidelines issued by the NOF and made available to the industry.

Of particular interest is the Emergency Communications System issue. An NOF task group is exploring the complexities of a nationwide closed user group communications system for voice and data to be used to alert the industry in the event of a widespread network failure anywhere in the country. No single, nationwide closed user group system exists which serves, or is available to, all carriers and other industry participants. However, there are basic systems which may be modified or combined to provide the national emergency notification network desired. I expect that the NOF will resolve this issue by the end of the first quarter of 1992.

SPONSORED COMMITTEES


COMMITTEE T1-TELECOMMUNICATIONS



CARRIER LIAISON COMMITTEE


TELECOMMUNICATIONS INDUSTRY FORUM


INFORMATION INDUSTRY LIAISON COMMITTEE


STANDARDS COMMITTEE 08


PROTECTION ENGINEERS GROUP



The Honorable Robert Wise

- 2 -

December 11, 1991

Other task groups are continuing to work on draft procedures for enhancing network integrity, including software and hardware validation, network restoration plans, exchange of testing information, signaling network architecture and engineering of SS7 signaling links.

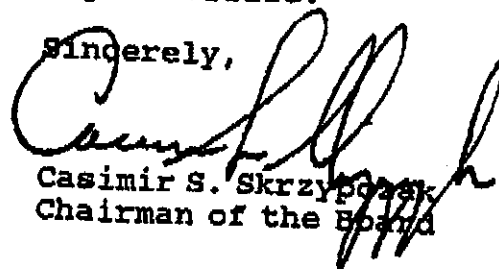
In advance of formal procedures being adopted, however, Rick Harrison, NOF moderator, reports that there has been a significant, voluntary increase in information exchange among carriers on a regular basis regarding network outages, installation, testing and maintenance, especially involving SS7.

As I mentioned above, work groups are meeting around the country in face-to-face sessions or conference calls to develop the working drafts for consideration by the NOF and the full forum reviews the status at each plenary session. The next full session will be January 7-9, 1992, and I will give you another update after that meeting.

The resolution of each of the 10 issues identified by the industry as particularly critical to network integrity is a complex task. The industry effort will, I believe, help assure Congress, the Commission, and the user public that network reliability is being given the highest priority by the NOF and the industry.

Susan M. Miller, ECSA General Counsel, is providing a complete set of NOF minutes on SS7 issues to Mr. Shoemaker of your office.

Sincerely,



Casimir S. Skrzybczak
Chairman of the Board

Network Operations Forum

November 13, 1991

To All NOF Participants:

*The following package contains the **DRAFT** copy of the minutes/notes of the SS7 Workshop meeting and the discussion of Issue #142, held on 10/30 - 31/91, in Dallas, TX.*

Please review for discussion, at the next meeting.

Art Walsh



NOF Secretary

**NETWORK OPERATIONS FORUM (NOF)
SS7 WORKSHOP
MEETING MINUTES
OCTOBER 30-31, 1991
HOSTED BY: GTE**

Attendance (Attachment 1)

Norb Lucash, Co-Chair, opened the meeting and welcomed everyone. He reviewed the SS7 Mission Statement and requested acceptance of the meeting minutes of October 2-3, 1991. The participants accepted the minutes and Norb continued the meeting with a review of the open issues.

REVIEW OF OPEN ISSUES

Issue #137 - Engineering of SS7 Signaling Links (D-Links)

Norb reviewed the Issue and requested comments from the group. It was noted, that a discussion had taken place during the General Session, in relation to whether the issue would remain Active in the NOF or the ICCF. It was also suggested, that the participants review the Issue, with their ICCF representatives in their home companies, and come prepared, at the next meeting, to offer contributions or withdraw the Issue. The group discussed the suggestion and agreed to maintain the Issue as Active, pending discussion at the next meeting (Attachment 2).

Issue #128 - Emergency Communications

Norb informed the committee, that the Ad hoc group had met on 10/28/91 and introduced Bill Belshaw, of ITN, who would provide an update of the activities. Bill thanked Norb and reviewed the progress of the Ad hoc committee, referencing the agreements on the type of communication system required and the concerns relative to the application of a voice/data network. Bill also noted, that the committee has agreed, that additional meetings would be necessary to complete the task of the group.

The participants discussed the need for an additional meeting and scheduled December 3-4, 1991, as the next Ad hoc meeting date. Lonnie Allen, Co-Chair of the Ad hoc committee, agreed to host the meeting and would provide the meeting information to the Secretary for distribution to the membership. The Issue will remain Active, pending the results of the Ad hoc committee (Attachment 3).

Issue #145 - SS7 Network Outage Information Exchange

Rick Harrison, NOF Moderator, reviewed the results of the conference call scheduled for October 11, 1991 and noted the following work items and action plans, developed during the call: (Attachment 4)

1. *Define an Outage*
2. *What Information is Shared*
3. *Guidelines for Vendor Information Sharing*
4. *Notification Vehicle*

Rick suggested, that the committee may want to address each item separately, in order to further develop the needed information. Rick also informed the group, that the Secretary had received a report on a recent SS7 outage and wished to share the information with the group.

Art Walsh, NOF Secretary, reviewed an SS7 outage report received from Frank Wissinger, of AGT, Edmonton, Canada, and also referenced a tracking report, which could be used by the NOF, to retain SS7 outage information for future use (Attachment 5).

Bob Schafer, of MCI, commented, that the focus of discussion should be on the capabilities of tracking and reporting troubles for local and regulatory requirements. Gene Rappoport, of AT&T, noted, that the EC/IC outage information exchange of information, should be different from regulatory reporting requirements, in that the information at hand, is relative to a specific problem or location.

Norb Lucash suggested, that the group continue discussion of the action items, as listed in the conference call notes, and requested input relative to:

Item #1 - Definition of an Outage. *A general discussion ensued, with the participants developing the following text, as a possible definition of an outage:*

A network failure resulting in blocked customer call attempts, exceeding average engineered blocking objectives, by a significant percentage, for a designated period of time.

The committee also discussed the scope of the issue, questioning whether the issue was addressing just SS7 failures or overall network failures.

Paul Kaiser, of Bell Atlantic, submitted a text definition of a service disruption, noting the following items:

A service disruption is a loss of telecommunication services, being provided by local or interexchange switches or other elements of the network. The service includes, but is not limited to;

- **Switch to Switch Intra-lata Service**
- **Toll Calls To and From an IC**
- **Local Calling**
- **800 Calls**

Norb recapped the discussions and suggested the participants review the definitions, in their home companies, and prepare a response for the next meeting. Gene Rappoport suggested, that the participants could also attempt to identify, a numeric value of blocked attempts, which could be applied to the issue.

Norb continued the meeting, addressing the:

2nd Item - What information is shared, and requested comments from the group. Dave Michael, offered a contribution entitled, **Service Failure Report**, for discussion of the item. The committee began review of the contribution, recommending various text changes to enhance to contents of the document. After much discussion, Paul Kaiser recommended, that the group consider utilizing the information provided in the existing regulatory report, **Service Failure Analysis Report (SFAR)**, to meet the requirements of the Issue. The participants discussed the suggestion and agreed to utilize the information presented in the report.

Clint Hamilton, of Bellcore, offered a contribution entitled **SS7 Outage Information Exchange Needs**, for consideration during discussion of the issue. Clint explained the matrix, noting the **Needs - Purpose - Time Frame - Vehicle**, for the sharing and dissemination of outage information. The participants reviewed the contribution and utilized the information, during continued discussion of the issue (**Attachment 6**).

The meeting continued, with the participants reviewing of the SFAR document and developing a new report document for the sharing of outage information (**Attachment 7**).

Norb continued the meeting, addressing **Item #3 - Guidelines for Vendor Information Sharing** and requested comments from the group. Rick Harrison introduced a contribution, which had been received from Dan Martin, of Ameritech, entitled **Information management**, for consideration during discussion of the issue (**Attachment 8**). Norb reviewed to contribution, which identified a variety of systems, utilized by the Ameritech's vendors, for the distribution of information. The committee reviewed the contents of the contribution, with discussion surrounding the types of communication utilized (**direct access vs dial up**) and whether the systems met the needs of the carriers (**ECs/ICs**).

After much discussion, the committee agreed to develop the following **Action Items**:

1. **Requiring all companies to review current vendor systems and determine if systems for information sharing are sufficient to meet the needs of the carriers.**
2. **Develop input, on carrier needs, for vendor guidelines.**

Allan Jones, of Pacific Bell, volunteered to contact the vendors, in Pacific Bell, and attempt to obtain a copy of their guidelines relative to information sharing with the carriers. If he is successful, he will provide the information at the next meeting (**Attachment 9**).

Rick Harrison suggested, that the NOF Secretary retain any outage information forwarded to him, on an interim basis, until a decision is made, as to where this information will be eventually be retained. The participants agreed with the suggestion. The issue will remain **Active**, pending further discussion, at the next meeting (**Attachment 10**).

Issue #144 - Network Restoration Plan

Gary Beohmerle reviewed the issue and requested comments from the group. Rick Harrison noted, that the output of this issue would be most likely be guidelines similar to what has been published in the NOF Network Management Guidelines. Garry Anderson, of New York Telephone, commented, that the committee may want to consider reactivating the Services and Features (S&F) committee to address the many issues surrounding this subject.

The group began a general discussion, referencing the existing SS7 automatic network controls and identifying the need for manual intervention into the network, under certain circumstances. Jerry Hill, of BellSouth, commented, that his company was in the process of developing a "Survivability Manual" which would outline a posture and resolution scenario, when addressing network problems. The committee continued to discuss various SS7 network management needs, and agreed to reactivate the S&F committee.

*Rick Harrison noted, that Frank Edminston, of Southwestern Bell, and Mark Neptune, of Teltec, were the EC and IC Co-Chairs, prior to deactivating the committee. Rick also stated, that he will contact Frank to determine if he is still available to serve in the EC Co-Chair capacity. He also reminded the group, that an IC Co-Chair would have to be selected, due to the unavailability of Mark Neptune. The participants discussed the need for continuity, in establishing the committee, as soon as possible, and agreed to have a conference call to discuss the details. A conference call date was established for **November 25, 1991, at 1:30 p.m. (EST). Telephone Number: 908-699-6700, Access Code 3558.***

The Issue will remain Active, pending further discussion, at the next meeting (Attachment 11).

Issue #139 - SS7 Software Validation

*Norb Lucash reviewed the issue and requested comments from the group. Gene Rappoport, of AT&T, offered a contribution entitled, **AT&T Software and Hardware Validation - Products Deployed in AT&T Network/Products Deployed in EC Networks**, for consideration during discussion of the issue (Attachment 12). Gene discussed both scenarios, outlining the test networks involved, and the test procedures followed by his company. He noted, that two (2) different test networks had to be developed, due to the different EC product requirements associated with interconnection.*

The participants began discussion of the contribution, noting that, the test results obtained by AT&T, and other equipment vendors, would be useful in determining future compatibility test scripts. Steve Pelossi, of BNR, offered to provide a contribution, similar to the one presented by Gene, at the next SS7 meeting. The committee accepted Steve's offer, and look forward to hearing the presentation, at the next meeting.

The committee also developed an Action Item, requiring the participants to review the contribution and develop additional requirements, as necessary, by the next meeting. The Issue will remain Active, pending further discussion (Attachment 13).

Issue #140 - Hardware Validation

The committee agreed that the contributions submitted for Issue #139, would also apply toward resolution of this Issue. Therefore, the Issue will remain Active, pending further contributions and discussion, at the next meeting (Attachment 14).

Issue 141 - Testing Information Exchange

Gary Beohmerle reviewed the issue and requested comments from the group. Gene Rappoport commented, that a matrix of "tests performed/equipment tested" would be extremely useful to the industry. He also commented, that his company does not want to test similar network configurations over and over again. Paul Kaiser, of Bell Atlantic, noted, that the committee must define the level of detail the industry requires, before developing a matrix of tests performed/equipment tested. Bob Schafer, of MCI, supported Gene's comments referencing the need for a matrix, to eliminate redundant network testing. The committee continued to discuss the subject, indicating that a list of "Who is providing What Tests" would suffice, in place of a matrix.

Due to the lateness of the hour, Norb suggested the committee adjourn for the day and continue discussion of the issue on the following morning. The group agreed and adjourned the meeting.

DAY 2

Norb welcomed everyone, recapped the issue discussion of the previous day, and requested additional comments from the group. The group continued to discuss the possibility of developing a vendor test list, which would identify "What" type of equipment had been previously tested and by "Whom". The committee also began discussion on the sharing of test information and questioned the accountability of doing so. Gene Rappoport commented, that test results must be retained and made available for others who wish to test a similar equipment. Art Doskow, of NYNEX, supported Gene's comments, reinforcing the need to share test information with the industry. It was noted by some of the participants, that specific "failed" information cannot be released by a company, for general use, due to legal constraints. Bob Schafer, of MCI, commented, that the committee needs to develop a vendor list of test requirements, and request that the vendors certify, that they are testing to and meeting the standards within the documents.

The participants agreed and developed the following list of non conformance test documents, which reference the testing requirements for the industry:

- SR-STTS-000317
- TR-NWT-000394
- TR-NPL-000246
- TR-TSV-000905

- *ANSI Standards (T1.110-115)*

*The committee developed an **Action Item**, requiring the vendors to report back on the vendor non conformance list; and ICs/ECs to check on legal impacts of sharing compatibility test results. The Issue will remain **Active**, pending further discussion, at the next meeting (Attachment 15)*

Issue #129 - SCCP Routing/Management Control Tests

*Bob Schafer commented, that his company was still working the issue and he would either present a contribution or withdraw the Issue, at the next meeting. The committee agreed to **Table the Issue**, pending a response from Bob (Attachment 16)*

*Allan Jones, of Pacific Bell, offered a contribution of a list of questions relative, to **Issue #128 - Emergency Communications**, which if answered by the participants, would assist the Ad hoc committee towards the development of a recommended emergency communications system for the industry. The group reviewed the contribution and developed an **Action Item**, requiring all companies to respond to the questions, at the next meeting (Attachment 17)*

*Norb recapped the following **Action Items**, developed during the meeting:*

- 1. Issue #145 - Review current vendor systems for information sharing are in use and sufficient.*
- 2. Review contribution and develop additional requirements, if necessary.*
- 3. Issue #128 - Respond to questions presented by Allan Jones.*

NEW BUSINESS

Norb suggested, that the participants review the pending issue status list and prepare the agenda for the next meeting. The committee agreed and developed the following agenda:

- *Issue #137 - Engineering of SS7 Signaling Links (D-Links)*
- *Issue #128 - Emergency Communications*
- *Issue #145 - SS7 Network Outage Information Exchange*
- *Issue #144 - Network Restorations Plans*
- *Issue #139 - SS7 Software Validation*
- *Issue #140 - Hardware Validation*
- *Issue #141 - Testing Information Exchange*
- *Issue #138 - SS7 Network Integrity - Security*
- *Issue #143 - SS7 Protocol Ambiguities/Alternatives*

- *Issue #146 - Signaling Network Architecture*
- *Issue #142 - Transfer Controlled (TFC) Ambiguities*

NOTE: The SS7 Workshop meeting continued at 1:00 p.m., addressing Issue #142 - Transfer Controlled (TFC) Application. See attached meeting notes.

As there was no other new business to discuss, Norb and Gary once again thanked the participants and extended a special thanks to the host Mark Slosson, of GTE, for the fine meeting arrangements. Meeting adjourned.

CONCURRED:

*Norb Lucash
Co-Chair (EC)*

*Gary Beohmerle
Co-Chair (IC)*

Network Operations Forum

Mission Statement

The Network Operations Forum (NOF) provides a working Telecommunications Forum for industry participants, both access customers and access providers to identify operations issues which are national in scope involving the installation, testing and maintenance of Access Services. The NOF provides a vehicle for the exchange of operations related information as well as a vehicle to develop resolutions to issues by consensus agreement for voluntary implementation by the industry. The (NOF) also provides administrative support for its subtending committees.

OPERATING PRINCIPLES

- The NOF addresses issues and develops consensus resolutions which become industry agreements. These agreements are not Standards. Implementation of these agreements is voluntary.
- Working committees will be Co-Chaired by an access customer representative and an access provider representative.
- Meetings to be cooperative and self policing
- Formal meeting announcement and agenda notices will be forwarded on a scheduled basis in accordance with established Carrier Liaison Committee industry forum procedures.
- Meeting minutes will be prepared and distributed, in a timely fashion in accordance with established Carrier Liaison Committee industry forum procedures.
- Issue introduction, discussion and closure will be addressed in accordance with established Carrier Liaison Committee industry forum procedures.
- Participation is open to all interested parties.
- Documents are available to all interested parties.
- NOF Moderator shall be impartial and shall remain neutral in issues and issue resolution discussions.

- NOF Secretary shall be impartial and shall remain neutral in issues and issue resolution discussions.
- Committee activation and meeting schedule will be driven by industry interest, as determined by General Session of the NOF.
- NOF will abide by established Carrier Liaison Committee operating principles.

ATTENDANCE - SS7 MEETING - 10/30/91

<u>NAME</u>	<u>COMPANY</u>	<u>TELEPHONE NUMBER</u>
Adams, Dennis	TRG	212-643-4559
Anderson, Garry	New York Tel.	212-693-3105
Allen, Lonnie	GTE	214-615-3481
Belshaw, William	ITN	816-561-9200
Beohmerle, Gary	SPT	216-526-3741
Bradley, Cathy	SNET	203-553-6100
Chun, Leonard	US Sprint	913-967-2164
Corson, Robert	Telesciences	609-866-1000
Dosko, Art	NYNEX	914-644-2027
Hamilton, Clint	Bellcore	908-758-3055
Hartness, Marshall	Centel	904-599-1582
Harrison, Rick	NOF Moderator	201-740-3558
Hill, Jerry	BellSouth	404-529-2589
Jones, Allan	Pacific Bell	415-823-7626
Kaiser, Paul	Bell Atlantic	215-466-2069
Kimbrough, Percy	Southwestern Bell	314-235-1584
Klug, Wendy	NECA	201-884-8188
Lewis, Karl	Siemens-Stromberg	407-330-6142
Li, Paul	NEC America	214-518-5000
Lucash, Norb	USTA	202-835-3260
Martin, Dan	ASI	312-220-2600
Mazurek, Diane	Ameritech	708-248-4384
Michael, Dave	U S WEST	612-663-6917
Nikkari, Leo	Unitel Comm. Inc.	416-345-2481
Pelosi, Steve	BNR	919-991-7907
Rappoport, Gene	AT&T	908-234-6230
Round, Richard	GTE	
Russo, Karl	SNET	203-553-6603
Schafer, Robert	MCI	214-918-5130
Slosson, Mark R.	GTE	214-718-1993
St. Jean, Joe	SNET	203-553-3257
Sushon, Bill	AT&T	201-805-7330
Urban, Wendall	MCI	214-918-6540
Wallace, Lightsey	Hekimian	301-590-3412
Walsh, Art	Bellcore (NOF Secretary)	201-740-4313

Thirty Five (35) Attendees

NOF ISSUE IDENTIFICATION FORM

ISSUE TITLE: *Engineering of SS7 Signaling Links (D-Link Quads)* **ISSUE #:** 137

COMMITTEE ASSIGNED: SS7

DATE SUBMITTED: 10/2/91

ISSUE ORIGINATOR: *Gene Rappoport*

RESOLUTION DATE:

TEL #: 908-234-6230

COMPANY: AT&T

REQUESTED RESOLUTION DATE: *1st Qtr. 1992*

FINAL CLOSURE:

1. **ISSUE STATEMENT:** *There is apparent conflict regarding the engineering of capacity for D-Link Quads used in SS7-NI. The design of these links is broadly described in TA-905 (sec. 2.1.4).*
2. **SUGGESTED RESOLUTION OR OUTPUT/SERVICE DESIRED:** *The design of the capacity in the D-Link quad should be based, within the the frame work of TR-TSV 000905, on the needs of the access customer.*
3. **OTHER IMPACTS:** *ICCF Issue #235*
4. **ISSUE DISCUSSION:** *The committee agreed to maintain the Issue asActive, pending either contributions or recommendation to withdraw, at the next meeting. NOTE: The Issue is an Active issue both the NOF and the ICCF.*
5. **RESOLUTION:**
6. **IMPLEMENTATION STATEMENT:**

NOF ISSUE IDENTIFICATION FORM

ISSUE TITLE: *SS7 Emergency Communications*

ISSUE #: #128

COMMITTEE ASSIGNED: *SS7 Workshop*

DATE SUBMITTED: *4/10/91*

ISSUE ORIGINATOR: *Dennis Bolen*

RESOLUTION DATE:

TEL #: *415-867-6502*

COMPANY: *Pacific Bell*

1. **ISSUE STATEMENT:** *The need exists for an emergency communication network to allow for communications in the event of a catastrophic SS7 Network Failure.*

2. **SUGGESTED RESOLUTION OR OUTPUT/SERVICE DESIRED:** *A PPSN connection should be established between all EC/IC SS7 Network Control Centers.*

3. **OTHER IMPACTS:**

4. **ISSUE DISCUSSION:** *Allan Jones, of Pacific Bell, informed the committee that his company would be offering a contribution at the next meeting. The committee elected to postpone further discussion of the issue until the next meeting. The issue will remain ACTIVE. 7/23/91 - The committee agreed to develop the following definition for the term Emergency catastrophic failure; A failure in the public network preventing Network Service Providers from communicating. The will remain Active, pending further discussion at the next meeting. 10/2/91 - The committee agreed to develop a Ad hoc group to address the alternatives eg. (SNOW and BEAMS) etc., to determine application for emergency system requirements. The Ad hoc committee will also be required to recommend alternative measures, if required. 10/30/91 - The Ad hoc committee will meet again on Dec. 3-4, 1991, in Dallas, TX., hosted by GTE, to further discuss the issue. See Allan Jones contribution attached to minutes of the October 30-31, 1991 SS7 Workshop. The issue will remain ACTIVE, pending further duscussion.*

5. **RESOLUTION:**

6. **IMPLEMENTATION STATEMENT:**

**REPORT ON NOF CONFERENCE CALL
OCTOBER 11, 1991
TO DISCUSS NOF ISSUES 144 AND 145**

The call was started at 1:30 PM, Eastern Daylight Time. Rick Harrison, NOF Moderator opened the call and asked for a roll call of who was participating. A list of participants is attached to this report. He then reviewed a letter that was faxed to primary company contacts and those, specifically requesting information on the call, as an introduction to what was hoped would be the outcome of the call. That being, a plan for work that could be started before the next meeting, that could be brought to that meeting as contributions. He also noted that an hour and one half was allotted for each issue, 144 and 145, with 145 being the highest priority and so, first on the agenda.

Issue 145 - SS7 Network Outage Information Exchange

Five separate work items were discussed, relative to this very broad issue. There was a lot of very good discussion relative to each work item to the point of actually working the issue(s)/items. Following are the work items and action plans:

1. Define an outage - Participants to investigate within their companies how an outage is defined. It was also suggested that they consult with their folks who are preparing comments to the NPRM-FCC 91-285.

2. What information is shared?
-Emergency notification
-Post-mortem
-High impact potential

Participants to investigate what is shared today, in particular, what forms (Service Failure Analysis Report -SFAR) are being used, and possibly revising these to accommodate SS7 failures/information. Dave Michael agreed to develop a contribution based on this information and asked that the participants send him any information they can. There was also discussion relative to putting together a matrix of what information gets shared under what circumstances, to who and for what purpose. Rick Harrison said that he would attempt to format this matrix for use at the next meeting.

3. Guidelines for vendor information sharing - There were no vendors on the call. The other participants however, agreed that there should be industry guidelines for vendor information sharing. At the very least, service providers could use these guidelines in their dealings with their vendors. There was also recognition of existing vendor information sharing systems. The participants felt that it would be good to document these existing information sharing procedures/systems. It was agreed that the participants would send to Rick Harrison, any information on such procedures/systems they have with their vendors. Rick would then try to consolidate these into a contribution for the next meeting.

4. Notification Vehicle - It was agreed that work was already underway with the establishment of the Emergency Communications System Ad Hoc Committee. No further action was taken at this time.

Issue 144 - Emergency Network Restoration Plans

After much discussion it was agreed that the most likely output from this issue would be guidelines similar to what has been published in the NOF, Network Management Guidelines and Contact Directory. It was also pointed out that this issue should be worked by Network Management SMEs. With that in mind, Garry Anderson, New York Telephone, suggested that the Services and Features (S&F) Committee be reactivated. The participants agreed. Garry will make this proposal at NOF General Session #24, on October 29. Attached is a copy of the S&F Committee Mission Statement.

There being no other business to conduct, the call was adjourned at 3:45PM.



Rick Harrison
NOF Moderator

Attachments: NOF Issue #145
NOF Issue #144
S&F Committee Mission Statement
Letter -10/7/91
Attendee List

NO. 001

Submitted by:

Frank Wissinger
AGT Limited
Edmonton, Alberta
403-493-3518

**EDTNAB0202W STP FAILURE
OCT. 10/91 4:03 PM to 9:50 PM**

OUTAGE SUMMARY

The EDTN STP failed at 4:03 PM on October 10/91 and was fully restored to service by 9:50 PM. Ninety six (96) out of 156 RTESETS were out of service for almost six (6) hours. The Calgary STP was unaffected and took over the load with no problem.

EVENT SYNOPSIS

- 1. Due to a chronic failure in the BITS II timing supply, that had not been successfully repaired, the following events occurred commencing at 16:03H on 10/10/91. The B Side clock of the BITS II was being replaced. When the card was plugged in, the A Line Side failed for 1/2 a second.*
- 2. When sync was lost, every link in the STP failed and all Routes affected went Transfer Prohibited (TFP). Once the links resynchronized and had been restored to service, the Route Management Procedures started to test and turned up the routes that went TFP.*
- 3. A software boolean variable called MTP_AUDIT_RUNNING (which controls whether or not a "wakeup process" can be run to audit Routeset management) was flipped from True to False. Because this audit process was prevented from running, it also prevented the Request_Audit_RSM_Routeset () procedure from executing. Ultimately the routesets could never be tested and thus could never be updated to Transfer Allowed (TFA). This is the reason why the Routesets could not automatically be restored.*
- 4. ETAS assistance was requested and obtained, they must have been aware of the problem with the BOOLEAN Expression as they told us the problem is possibly being caused by Bad Patch KDW26 and that they are in the process of writing a replacement patch HAS54.*
- 5. BC Tel. has had a similar problem which was caused by a similar series of events. In their case it was initiated by the failure of a MTRLPQ B Link. As a matter of interest and urgency, this problem has reoccurred in BC Tel. at 13:20H today, exactly five (5) minutes after we had asked them what had caused their previous problem.*

This EVENT could have had serious consequences and the outage been longer if it had happened after hours and if the STP were carrying a heavier load. The scenarios that could be

thought of and the severities could be almost endless.

This event exemplifies the need for:

1. **Outage information sharing**
2. **Vendor disclosure of perceived problems (In the case of CCS7 no matter how minor)**
3. **The list could go on.**

1.0 BITS FAILURE

We are experiencing occasional rapid changes in the output of the Edmonton BITS.

1. *The frequency of these occurrences seems to be increasing and may be about once a day.*
2. *The event itself seems to be nothing more than a rapid increase in wander with changes in the order of 50 micro seconds.*
3. *Both T1 and Composite clock outputs are affected.*
4. *The DACSII has been our indicator of problems, as it goes into holdover every time it loses all sync inputs. We assume the input monitoring circuit declares the input invalid after rapid phase shift occurs on the sync input.*
5. *Other Switching machines have noticed the hits but did not go to holdover.*
6. *Initially the A clock was always active, no switching to the B clock was observed.*
7. *When we activated the B clock on 911009, we found the next day that A was active again.*
8. *The first TOCA card had switched to the hot standby.*
9. *CCS7 had not complained.*

On the 10th of October, we were investigating complaints from the previous 24 hr. during which two (2) hits were recorded. We decided to exchange the B clock for the PMS clock and the following happened:

1. **Removal of a B clock was hitless.**
2. **Insertion of PMS clock caused A clock active light to extinguish with alarms going off.**
3. **The active light came back on for awhile before extinguishing a second time.**
4. **Active light came back on and stayed on, the A clock stabilized while the B clock started warm up for the next 45 minutes.**

The above caused a signal loss of about 47 seconds, and we decided that we should restore TOCA card #1, which was manually switched back to the working card. This produced another hit.

At 16.55 hrs. I transferred the clock from A to B, which occurred without a hit. Two (2) minutes later the alarms went off and we noticed the DASCSSII sync alarm which restored in about 15 seconds. When checking the Tautron monitoring the BITS, we found the a large 200 micro sec. phase shift had occurred because the clock had switched back to A. Everything seemed to have settled down again except for the CCS7, it appears that this time they lost their sync input completely and when the sync signal returned, the CCS7 switch refused to restore its functions. This turned out to be a software defect which Northern Telecom (NTL) will fix in time. The switch was eventually restored to service manually. Manual restoral is possible but time consuming (15 min) and we should probably wait with further interruptions until NTL has given CCS7 automatic recovery.

The CCS7 failures point to a basic weakness in the STP/LPP design; The absence of a built-in clock for the LPP, even though the STP switch has a ST3 clock, there is no connection to the LPP, which requires composite clock. This means that when our sync signal fails, the LPP has no clock at all and fails. This makes the CCS7 STP switch different from all other switches which have a built in clocks allowing them to function when the sync input fails.

In order to provide CCS7/STP with the same protection from sync failures as other switches have, I propose that both Edmonton and Calgary STP switches be equipped with their own clock shelf.

A stratum 2.5 shelf with dual clocks would cost about \$25,000.00.

A stratum 3 shelf with dual clocks would cost about \$10,000.00.

Another option is to provide only a single clock, this would save \$10,000.00 for the ST2.5 and about \$2,400.00 for the ST3.

SOLUTION:

BITS clock to be installed at STP sites Edmonton and Calgary.

SS7 OUTAGE INFORMATION EXCHANGE NEEDS

Need	Purpose	Time Frame	Vehicles
<ul style="list-style-type: none"> ●Emergency Communication During Network Failure 	<ul style="list-style-type: none"> -Get Network Up & Running -Coordinate EC/ICs 	Immediate	<ul style="list-style-type: none"> ●PSTN (alone) ●Emergency Communication System (ECS) (BEAMs, SNOW, etc.)
<ul style="list-style-type: none"> ●Initial Outage Notification & Potential High Impact Event Info. Exchange 	<ul style="list-style-type: none"> -Advise of Incident -Socialize Event Specifics -Enable Service Providers To React To Similar Events In Their Network 	Hours-Days	<ul style="list-style-type: none"> ●SS7 Failure Report (SFAR, abnormal, Fax, E-mail, Phone)
<ul style="list-style-type: none"> ●Outage Post Mortem Details of Outage Causes 	<ul style="list-style-type: none"> -Exchange Results of Analysis -Understand Root Causes -Take Corrective Actions 	Weeks-Months	<ul style="list-style-type: none"> ●SS7 Failure Report ●NOF Outage Review

Subject: Information Management

October 24, 1991

To: Rick Harrison

Rick,

Ameritech's vendors use the following systems to send information.

AT&T

- CSANS (alerts viewed by Technical Support)
- Send FAX (to site if message is urgent)
- Phone Call to technical support if message urgent

Siemens

- CSANS (alerts viewed by Tec. Support)
- Send FAX (to site if message is urgent)
- Phone Call to technical support if message urgent

Northern Telecom

- CSANS (alerts viewed by Tec. Support as BENWS (pronounced BEENEWS))
- Send FAX (to site if message is urgent)
- Phone call to technical support if message is urgent.

DSC (STP)

- Send FAX to site & technical support
- Phone call to technical support if message is urgent.

I hope this information helps you.

Please direct any question to Daniel N. Martin,
(312)220-2600.

NOF ISSUE IDENTIFICATION FORM

ISSUE TITLE: *SS7 Network Outage Information Exchange*

ISSUE #: 145

COMMITTEE ASSIGNED: *SS7*
10/3/91

DATE SUBMITTED:

ISSUE ORIGINATOR: *SS7 Workshop*

RESOLUTION DATE:

TEL #:

COMPANY:

REQUESTED RESOLUTION DATE: *4th Qtr., 1991*

FINAL CLOSURE:

1. **ISSUE STATEMENT:** *The lack of an ongoing and timely information exchange process, regarding network outages, inhibit the ability of the Service Providers to effectively react to/prevent similar occurrences in their own networks.*

2. **SUGGESTED RESOLUTION OR OUTPUT/SERVICE DESIRED:** *An industry process should be developed to exchange network outage information.*

3. **OTHER IMPACTS:** *The process needs to address:*

- *Notification Vehicle*
- *Post Mortem Sharing*
- *What is an Outage*
- *What information is shared, etc.*

Other existing related NOF Issues.

4. **ISSUE DISCUSSION:** *10/30/91 - The participants reviewed the conference call notes and developed addressed the items 1-4. The group developed a proposed definition for an outage, developed a SS7 Outage Information Report, and listed various items of concern in relation to current vendor report systems. The participants also developed an Action Item : Requiring all companies to review current vendor systems and determine if systems for information sharing are sufficient to meet the needs of the carriers (EC/IC). The group also will require the group to: Develop input, on carrier needs, for vendor guidelines. See attachment to Issue for proposed definition contribution for the term Outage. The Issue will remain Active, pending further discussion, at the next meeting.*

5. **RESOLUTION:**

6. **IMPLEMENTATION STATEMENT:**

Attachment to Issue #145:

Committee Proposal;

A network failure resulting in blocked customer call attempts, exceeding average engineered blocking objectives, by a significant percentage, for a designated period of time.

Paul Kaiser contribution;

A service disruption is a loss of telecommunication services, being provided by local or interexchange switches or other elements of the network. The service includes, but is not limited to;

- *Switch to switch Intra-lata Service*
- *Toll calls to and from an IC*
- *Local calling*
- *800 calls*

NOF ISSUE IDENTIFICATION FORM

ISSUE TITLE: *Emergency Network Restoration Plans*

ISSUE #: 144

COMMITTEE ASSIGNED: SS7

DATE SUBMITTED: 10/3/91

ISSUE ORIGINATOR: *Walt Roehr/Don Mintz*

RESOLUTION DATE:

TEL #: 703-435-1787/903-949-8767

COMPANY: TNC/AT&T

REQUESTED RESOLUTION DATE:

FINAL CLOSURE:

1. **ISSUE STATEMENT:** *In view of the ongoing history of automated SS7 network management capabilities being the vehicle that brings down the SS7 network, there is a clear need to provide alternatives to automated capabilities, ie. manual capabilities. Volume and frequency of software and hardware additions/modifications in our networks are growing substantially greater every year. Activities to bullet proof the network so that it will operate flawlessly without human intervention are not and will not be sufficient to safeguard the reliable operation of the SS7 network.*

2. **SUGGESTED RESOLUTION OR OUTPUT/SERVICE DESIRED:** *Specifications of intra-and inter network sending and reporting capabilities and intra-network manual control capabilities that will allow an empowered human being to effectively control the SS7 network in the face of automated control insanity. The development of a dialogue and working environment among the industry's network management /Operations community to specifically identify network failure problem types, extent of impact measurements, manual NM control solutions, and communication protocols and procedures that will be used to combat a massive SS7 network failure. The goal will be to identify and isolate the problem, minimize service disruptions, and stabilize the network in a timely manner.*

3. **OTHER IMPACTS:**

4. **ISSUE DISCUSSION:** *Gary Anderson recommended, that the S&F Committee be reactivated to address the many issues associated with the issue and subject of Network Management. The participants agreed to the recommendation and established a conference call scheduled for November 25, 1991, at 1:30 EST to discuss the needs of the committee. Telephone Number: 908-699-6700, Access Code 3558. The Issue will remain Active, pending further discussion.*

5. **RESOLUTION:**

AT&T SOFTWARE & HARDWARE VALIDATION PRODUCTS DEPLOYED IN AT&T NETWORK

- o Testing and validation required at each step of the development process**
- o Includes OA&M, OSS, test tools and documentation**
- o First Office Application in test network**
- o Test network includes signaling, switching, data base and cross connect systems in the AT&T network**
- o First Field Application limited to one or two locations**
- o We can and do connect test network to:**
 - Other carriers live networks**
 - Other carriers test networks**
 - Other carriers test labs**
 - Other vendor test networks**
 - Other vendor test labs**
- o 100% regression testing is complex and time consuming
Therefore, usually only partial**

**AT&T SOFTWARE & HARDWARE VALIDATION
PRODUCTS DEPLOYED IN EC NETWORKS**

- o Testing and validation required at each step of the development process**
- o Includes test tools, documentation and OSS, where appropriate**
- o AT&T interproduct validation in test network**
- o First Field Application in limited locations**
- o First network application, where integration tests are required, is a field application**
- o EC product test network connected to AT&T test network**
- o We have interconnected to other vendors and are planning additional inter-vendor testing**
- o 100% regression testing is complex and time consuming
Therefore, usually only partial**

NOF ISSUE IDENTIFICATION FORM

ISSUE TITLE: *SS7 Software Validation*

ISSUE #: *139*

COMMITTEE ASSIGNED: *SS7*

DATE SUBMITTED: *10/2/91*

ISSUE ORIGINATOR: *Allan Jones*

RESOLUTION DATE:

TEL #: *510-823-7672*

COMPANY: *Pacific Bell*

REQUESTED RESOLUTION DATE: *Feb. 1992*

FINAL CLOSURE:

1. **ISSUE STATEMENT:** *Software enhancements (changes) including generic updates are among some of the most complex and vulnerable activities in the SS7 environment.*
2. **SUGGESTED RESOLUTION OR OUTPUT/SERVICE DESIRED:** *Therefore, a formal validation/integrity process & criteria need to be developed that would check the functions and integrity of the software prior to application in a working environment. Vendor and Service Providers co-operatively develop a set of validation and testing criteria for software, prior to application.*
3. **OTHER IMPACTS:** *To be considered:*
 - *Vendor Internal (Include cross product)*
 - *Vendor - Vendor Testing*
 - *Network Provider Testing*
 - *Internetwork Testing*
4. **ISSUE DISCUSSION:** *10/30/91 - Gene Rappoport presented two (2) contributions for consideration during discussion of the Issue (AT&T Software and Hardware Validation - Products Deployed in AT&T Network/Products deployed in EC Networks). The committee developed an Action Item, requiring the participants to review the contribution and develop additional requirements, as necessary. The Issue will remain Active, pending further discussion.*
5. **RESOLUTION:**
6. **IMPLEMENTATION STATEMENT:**

NOF ISSUE IDENTIFICATION FORM

ISSUE TITLE: *Hardware Validation*

ISSUE #: 140

COMMITTEE ASSIGNED: SS7

DATE SUBMITTED: 10/2/91

ISSUE ORIGINATOR: SS7 Workshop

RESOLUTION DATE:

TEL #:

COMPANY:

REQUESTED RESOLUTION DATE:

FINAL CLOSURE:

1. **ISSUE STATEMENT:** *Hardware additions and changes are among the most complex and vulnerable activities in the SS7 environment. Therefore, a formal validation/integrity process and criteria need to be developed that would check the functions and integrity of the hardware, prior to application in a working environment.*
2. **SUGGESTED RESOLUTION OR OUTPUT/SERVICE DESIRED:** *Vendor and Service Providers cooperatively develop a set of validation and testing criteria for hardware, prior to the addition or change.*
3. **OTHER IMPACTS:** *To Be considered:*
 - *Vendor Internal (Includes cross product)*
 - *Vendor to Vendor*
 - *Network Provider*
 - *Internetwork*
4. **ISSUE DISCUSSION:** *10/30/91 - The committee agreed to apply the contributions associated with Issue #139 (AT&T) for discussion of this Issue also. The Issue will remainActive, pending further discussion, at the next meeting.*
5. **RESOLUTION:**
6. **IMPLEMENTATION STATEMENT:**

NOF ISSUE IDENTIFICATION FORM

ISSUE TITLE: *Testing Information Exchange*

ISSUE #: 141

COMMITTEE ASSIGNED: SS7
10/3/91

DATE SUBMITTED:

ISSUE ORIGINATOR: *SS7 Workshop*

RESOLUTION DATE:

TEL #:

COMPANY:

REQUESTED RESOLUTION DATE: *1st Qtr. 1992*

FINAL CLOSURE:

1. **ISSUE STATEMENT:** *Lack of an effective means of sharing test results deprives Network Providers of valuable information and results and have to repeat the same tests.*
2. **SUGGESTED RESOLUTION OR OUTPUT/SERVICE DESIRED:** *A trusted and efficient test information sharing mechanism be established. Information concerning testing that has been completed (including test configurations) and problems encountered should be included.*
3. **OTHER IMPACTS:**
4. **ISSUE DISCUSSION:** *10/31/91 - The committee discussed the Issue and developed the following list of test requirements, and requested that the vendors certify, that they are testing to and meeting the Standards, within the documents. The issue will remain Active, pending further discussion.*
5. **RESOLUTION:**
6. **IMPLEMENTATION STATEMENT:**

NOF ISSUE IDENTIFICATION FORM

ISSUE TITLE: *SCCP Routing Management Controls Tests*

ISSUE #: #129

COMMITTEE ASSIGNED: *SS7 Wkshp*

DATE SUBMITTED: *6/5/91*

ISSUE ORIGINATOR: *Bob Schafer*

RESOLUTION DATE:

TEL #: *214-918-5130*

COMPANY: *MCI*

FINAL CLOSURE:

1. **ISSUE STATEMENT:** *The current NOF Compatibility testing document for SCCP does not include certain test scripts associated with SCCP routing and management controls.*

2. **SUGGESTED RESOLUTION OR OUTPUT/SERVICE DESIRED:** *Revise NOF documentation to include SCCP routing and management control tests.*

3. **OTHER IMPACTS:** *ANSI T1.112.1-4, Bellcore TR-TSY-000082.*

4. **ISSUE DISCUSSION:** *7/24/91 - Bob Schafer may wish to offer a contribution to the issue at the next meeting. 10/2/91 - Bob Schafer may wish to offer a contribution at the next meeting. 10/30/91 - Bob Schafer requested that the Issue be Table, pending a contribution or withdrawal of the Issue, at the next meeting. The committee agreed to Table the Issue. The Issue will remain Tabled, pending further discussion.*

5. **RESOLUTION:**

6. **IMPLEMENTATION STATEMENT:**

Attachment to Issue #128;

Emergency Communications System

- 1. What do we want/need this system to do for us and the Customer?**
- 2. Which contribution (s) meets the above needs/requirements the most?**
- 3. What enhancements need to be include to adopt a contribution as as NOF recommendation?**
- 4. Who needs to pursue these enhancements?**
- 5. What do we want in the future (5yrs +)?**

NOTE: The questions address both Voive and Data considerations.