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DEFENSE INFORMATION SYSTEMS AGENCY

JOINT INTEROPERABILITY TEST COMMAND
FORT HUACHUCA, ARIZONA 85613-7020

IN REPLY
REFER TO:

Networks, Transmission and
Intelligence Division (JTE)

APR - 1 2002

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Joint Interoperability Test Certification of
Tekelec Eagle Signal Transfer Point (STP),
Software Release 23.1

Reference: (a) DOD Directive 4630.5, "Interoperability and
Supportability of Information Technology
(IT) and National Security Systems (NSS),"
January 11, 2002

(b) CJCSI 6212.01B, "Interoperability and
Supportability of National Security Systems,
and Information Technology Systems," May 8,
2000

1. References (a) and (b) establish the Defense Information Systems Agency (DISA), Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification. Additional references are provided in enclosure 1.
2. The Tekelec Eagle Signal Transfer Point (STP) with Software Release 23.1 meets the interoperability requirements for deployment in the Defense Information System Network (DISN) and is certified for joint use. This certification expires upon changes that affect interoperability, but no later than three years from the date of this memorandum.
3. This certification is based on testing conducted by the JITC, September through December 2001. Testing was conducted at the JITC Network Engineering and Integration Lab (NEIL), Fort Huachuca, Arizona. The Certification Testing Summary (enclosure 2) documents the test results and describes the test network.

System interoperability should be verified in an operational environment that varies significantly from the test environment.

4. Interoperability certification testing of the STP consisted of two areas: the STP's conformance to Signaling System 7 (SS7) standards and the STP's ability to support required interfaces with associated Exchange Requirements (ERs). Testing was carried out in accordance with reference (d). Table 1 lists the SS7 conformance requirements status and table 2 lists the interface & ER interoperability status.

Table 1. Eagle STP Conformance Requirements Status

Conformance Requirement	Reference	Critical	Status
SS7 Network Structure	GSCR Para 6.5.1	Yes	Met
Signaling Link Characteristics	GSCR Para 6.5.2	Yes	Met
Signaling Message Handling, Formats, and Codes	GSCR Paras 6.5.3-5, 6.5.10-11.	Yes	Met
Signaling Network Management	GSCR Para 6.5.4	Yes	Met
Error Detection and Recovery	GSCR Para 6.5.2.1	Yes	Met
Signaling Link Congestion	GSCR Para 6.5.4.2	No	Not tested
LEGEND:			
GSCR - Generic Switching Center Requirements			
SS7 - Signaling System 7			

Table 2. Eagle STP Interface & Exchange Requirements Status

Interface	Exchange Requirement	Critical	Status	Remarks
V.35	SS7 A, B & C-Links IAW GSCR Para 6.5	Yes	Certified	All requirements met
OCU-DP	SS7 A, B & C-Links IAW GSCR Para 6.5	Yes	Certified	All requirements met
DS1	SS7 A, B & C-Links IAW GSCR Para 6.5	No	Not tested	
DS0A	SS7 A, B & C-Links IAW GSCR Para 6.5	No	Not tested	

LEGEND:

A-Link - Access Link (SS7)
 B-Link - Bridge Link (SS7)
 C-Link - Cross Link (SS7)
 DS0 - Digital Signal Level Zero: One 64 Kbps channel
 DS0A - A process where a sub-rate signal is repeated 20, 10 or 5 times to make a 64 Kbps DS0 channel
 DS1 - Digital Signal Level One: 1.544 Mbps North America Transmission
 GSCR - Generic Switching Center Requirements
 IAW - In Accordance With
 ITU - International Telecommunication Union
 OCU-DP - Office Channel Unit-Data Port
 SS7 - Signaling System 7
 V.35 - ITU Standard for synchronous data circuits

NOTE:
 Per the GSCR, only one of the four STP interfaces is required for certification (V.35, DS0A, DS1, or OCU-DP).

5. The Tekelec STP meets all critical conformance requirements. Conformance to signaling link congestion requirements was not tested because the traffic loading resources currently available at the JITC were unable to initiate enough call attempts to overload a signaling link or exceed congestion onset thresholds. STPs are deployed in the commercial SS7 network and no problems with congestion conformance are known. It is likely that the Tekelec STP conforms to the signaling link congestion protocol messages and that no problems will occur with the DSN.

JITC Memo, Networks, Transmission and Intelligence Division (JTE), Joint Interoperability Test Certification of Tekelec Eagle Signal Transfer Point (STP), Software Release 23.1

6. Section 6 of reference (d) requires that STPs provide at least one of the following interface types: V.35, OCU-DP, DS1 or DS0A. The Tekelec Eagle STP is capable of supporting V.35, DS0A, DS1 and OCU-DP interfaces. The V.35 and OCU-DP interfaces are planned for use in the DSN and therefore, the DS0A and DS1 interfaces were not tested.

7. Testing of the Tekelec STP was conducted in the NEIL over a network that emulates the planned DSN SS7 architecture, and included the following DSN components:

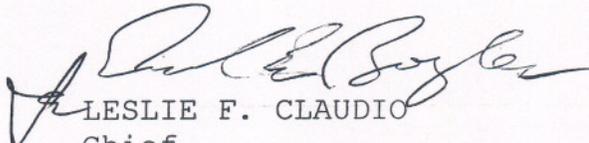
Nortel Broadband STP	Release 3.0.3.18d
Nortel Networks MSL-100	Release MSL-15
Siemens EWSD	Release 18
Lucent 5ESS	Release 5E15
Promina 400	Release 2.04.03
Premisys IMACS/800	Release 3.8.0
Access-T 1500	087-161E-03C/087-062E-01C

8. JITC disseminates certification testing information to the Department of Defense (DOD) community via the Joint Interoperability Tool (JIT), which resides on the SIPRNET at <http://199.208.204.125/> or at <http://198.17.54.202/> (mirror site), and on the NIPRNET at <http://jit.fhu.disa.mil/>. A copy of this certification memorandum and enclosures will be available on the JIT. Instructions for obtaining access to JIT information are contained on the above homepages.

9. The JITC point of contact is Captain Gordon Bradley, DSN 821-8575 or commercial (520) 533-8575. Captain Bradley's e-mail address is bradleyg@fhu.disa.mil.

FOR THE COMMANDER:

2 Enclosures:
1 Additional References
2 Certification Testing
Summary


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Eagle Signal Transfer Point (STP), Software Release 23.1

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JS-J38, JCS, Pentagon, Washington, DC 20318

Additional References

- (c) Bellcore GR-82-CORE, "Signal Transfer Point Generic Requirement," 1996
- (d) Defense Information Systems Agency (DISA), Joint Interoperability and Engineering Organization (JIEO), Technical Report 8249, "Defense Information Systems Network (DISN) Circuit Switched Subsystem, Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR)," March 1997
- (e) Joint Interoperability Test Command, "Signaling System 7 Signal Transfer Point Test Plan," July 2001

CERTIFICATION TESTING SUMMARY

1. **SYSTEM TITLE.** Tekelec Eagle Signal Transfer Point (STP), Software Release 23.1.
2. **PROPONENT.** Defense Information Systems Agency (DISA).
3. **PROGRAM MANAGER.** Mr. Howard Osman, ATTN NS53, Room 5w23, 5275 Leesburg Pike (RTE 7), Falls Church, VA 22041, e-mail: Osmanh@ncr.disa.mil.
4. **TESTERS.** DISA (NS581), and Joint Interoperability Test Command (JITC), Fort Huachuca, AZ.
5. **SYSTEM UNDER TEST DESCRIPTION.** STPs are deployed in the Defense Information System Network's (DISN) Defense Switched Network (DSN) to route signaling messages between Service Switching Points (SSPs). The Tekelec Eagle STP is a standalone STP capable of routing call setup, call control, network management, user-to-network, and user-to-user signaling messages throughout Signaling System 7 (SS7) networks. The STPs also support a broad range of intelligent network services such as Local Number Portability (LNP) and Calling Name Delivery (CND).
6. **OPERATIONAL ARCHITECTURE.** The Tekelec Eagle STP was tested at the JITC Network Engineering and Integration Lab (NEIL) in a manner and configuration similar to that of the DSN SS7 architecture. Tekelec Eagle STPs are currently deployed in Japan, Korea, Hawaii, and Alaska.
7. **REQUIRED SYSTEM INTERFACES.** Testing was carried out in accordance with Generic Switching Center Requirements (GSCR), dated March 1997. Table 1 lists the SS7 conformance requirements status, and table 2 lists the interoperability status for each interface along with associated Exchange Requirements (ERs). The GSCR requires that STPs support at least one of the following data link interfaces: V.35, OCU-DP (DS-CS), DS1, or DS0A. In addition to the V.35 interface, the Tekelec Eagle STP is also capable of supporting OCU-DP, DS0A, and DS1 interfaces.

Table 1. Eagle STP Conformance Requirements Status

Conformance Requirement	Reference	Critical	Status
SS7 Network Structure	GSCR Para 6.5.1	Yes	Passed
Signaling Link Characteristics	GSCR Para 6.5.2	Yes	Passed
Signaling Message Handling, Formats, and Codes	GSCR Paras 6.5.3-5, 6.5.10-11	Yes	Passed
Signaling Network Management	GSCR Para 6.5.4	Yes	Passed
Error Detection and Recovery	GSCR Para 6.5.2.1	Yes	Passed

Table 1. Eagle STP Conformance Requirements Status (continued)

Signaling Link Congestion	GSCR Para 6.5.4.2	No	Not tested
LEGEND:			
GSCR - Generic Switching Center Requirements			
SS7 - Signaling System 7			

Table 2. BBSTP and Eagle STP Interface & Exchange Requirement Status

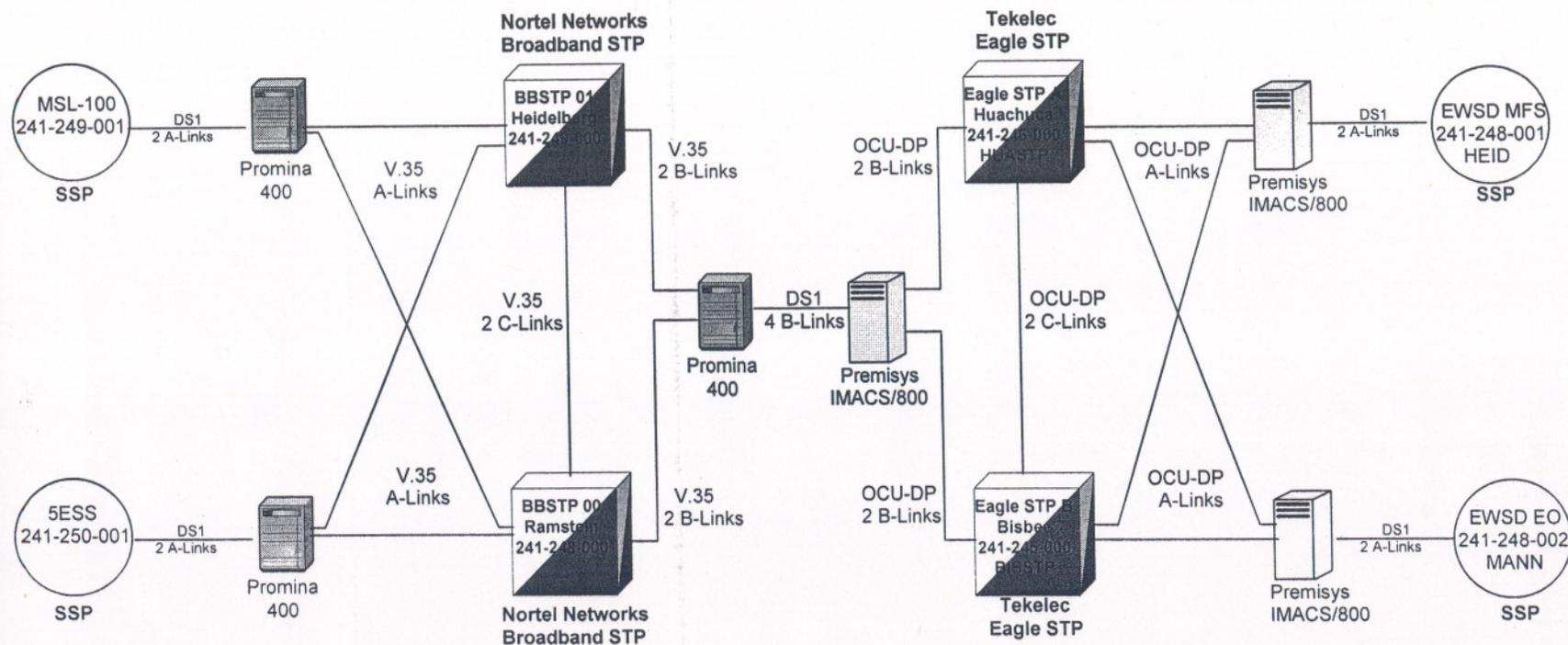
Interface	Exchange Requirement	Critical	Status
V.35	SS7 A, B & C-Links IAW GSCR Para 6.5	Yes	Certified
OCU-DP	SS7 A, B & C-Links IAW GSCR Para 6.5	Yes	Certified
DS1	SS7 A, B & C-Links IAW GSCR Para 6.5	No	Not tested
DS0A	SS7 A, B & C-Links IAW GSCR Para 6.5	No	Not tested
LEGEND:			
A-Link - Access Link (SS7)			
B-Link - Bridge Link (SS7)			
C-Link - Cross Link (SS7)			
DS0 - Digital Signal Level Zero: One 64 Kbps channel			
DS0A - A process where a sub-rate signal is repeated 20, 10 or 5 times to make a 64 Kbps DS0 channel			
DS1 - Digital Signal Level One: 1.544 Mbps North America Transmission			
GSCR - Generic Switching Center Requirements			
IAW - In Accordance With			
ITU - International Telecommunication Union			
OCU-DP - Office Channel Unit-Data Port			
SS7 - Signaling System 7			
V.35 - ITU standard for synchronous data circuits			
NOTES:			
Per the Section 6 of the GSCR only one of the four STP interfaces is required for certification (V.35, DS0A, DS1, or OCU-DP).			

8. TEST NETWORK DESCRIPTION. The test network configuration depicted in figure 1 accurately emulates the DISN SS7 operational environment. The Eagle STPs were configured as mated pairs and connected to the MSL-100, EWSD, and 5ESS SSPs via Premisys IMACS/800 channel banks. The Premisys IMACS/800 channel bank was used to convert the OCU-DP links provided by Tekelec Eagle STPs to DS1. The Eagle STP signaling links were initially configured and tested using the V.35 interface and later changed to OCU-DP interface due to V.35 patch panel limitations in the NEIL. The STP pairs were also interconnected via B-links through the Promina 400 and Premisys IMACS/800 channel banks as illustrated in figure 1.

9. SYSTEM CONFIGURATIONS. Table 3 lists the hardware and software configurations associated with the components used during the test.

Table 3. Tested System Configuration

System Name	Hardware	Software
Tekelec Eagle STP	Eagle Data Packet Switch	Release 23.1
Nortel Networks Broadband STP	Signaling Server Platform	Version 3.0.3.18d
Nortel Networks MSL-100 SSP	RISC Processor	MSL-15
Siemens EWSD SSP	CP 113C	Version 18
Lucent 5ESS SSP	5ESS	5E15
Prominia 400	Promina 400	2.04.03
Premisys IMACS/800 Channel Bank	Premisys IMACS/800	Release 3.8.0
Access-T 1500 CSU/DSU	Access-T 1500	087-161E-03C/087-062E-01C
LEGEND:		
5ESS - Electronic Switching System (No. 5) (Lucent switch)		
CSU - Channel Service Unit		
DSU - Data Service Unit		
EWSD - Elektronisches Wahl System Digital (Siemens switch)		
MSL - Meridian Switching Load (Nortel Networks switch)		
RISC - Reduced Instruction Set Computer		



LEGEND:

- | | | | |
|--------|---|-------------|---|
| A-Link | - Access Link (SS7) | SS7 | - Signaling System 7 |
| B-Link | - Bridge Link (SS7) | SSP | - Service Switching Point |
| C-Link | - Cross Link (SS7) | STP | - Signal Transfer Point |
| DS1 | - Digital Signal Level 1 (1.544 Mbps) | V.35 | - Standard data link interface (56/64 Kbps) |
| EO | - End office | 5ESS | - Electronic Switching System (No. 5) (Lucent Switch) |
| EWSD | - Elektronisches Wahl System Digital (Siemens switch) | | |
| HEID | - Heidelberg, Germany | 241-245-000 | to |
| MANN | - Mannheim, Germany | 241-250-001 | |
| MFS | - Multi-function Switch | | |
| MSL | - Meridian Switching Load (Nortel Networks switch) | | |
| OCU-DP | - Office Channel Unit-Data Port | | |

Figure 1. Test Network Configuration

10. TESTING LIMITATIONS. All interfaces required for initial deployment of the Eagle STP were successfully tested in an operationally realistic environment. However, JITC was unable to generate enough voice and signaling traffic to demonstrate compliance with the signaling link congestion control requirements specified in reference (c). This limitation should have no negative operational impact in DISN-Europe or DISN-Pacific because it is likely that the STP conforms as Tekelec STPs are deployed in large commercial SS7 networks with volumes of signaling traffic in excess of what DOD is expected to generate.

11. ASSESSMENT RESULTS

a. Conformance Results. The Eagle STP meets all the SS7 STP conformance requirements in accordance with references (c) and (d) using the detailed test procedures described in reference (e), with one exception (refer to table 1). Sub-test 6.0 (Signaling Link Congestion) was not tested. The traffic loading resources currently available at the JITC were unable to initiate enough call attempts to overload a signaling link or exceed congestion onset thresholds. The inability to verify STP and SSP compliance with congestion control requirements should have no impact upon their deployment in the DISN. One 56 Kbps signaling link has more than enough capacity to support the traffic normally routed between two Defense Switched Network (DSN) SSPs.

b. Interoperability Results

(1) Interoperability between the Tekelec Eagle STP and the Nortel Networks MSL-100, Siemens EWSD, and Lucent 5ESS SSPs was successfully tested. SS7 call setup and control messages were routed to the correct destinations by the STPs and inter-switch calls were completed successfully. Signaling link management functions such as initial alignment, changeover, change-back, and emergency alignment were executed properly by the STPs and SSPs. SS7 signaling link interfaces (A-Links, B-Links, and C-Links) were also certified as part of these tests.

(2) Interoperability between the Eagle STP and Nortel Networks BBSTP was also successfully tested. SS7 call setup, control, and signaling network management messages were successfully routed via B-links between the Eagle STP and Nortel Networks BBSTP. Both STPs performed signaling network management functions in accordance with requirements specified in references (c) and (d).

(3) Interoperability between the Premisys IMACS/800 channel bank, Eagle STPs and Nortel Networks MSL-100, Siemens EWSD, and Lucent 5ESS SSPs was successfully tested. SS7 call setup, control, and signaling network management messages were successfully routed via A-Links between Eagle STPs and Nortel Networks MSL-100, Siemens EWSD, and Lucent 5ESS SSPs. The OCU-DP signaling data link accepted by the Tekelec Eagle STP was also successfully tested.

(4) Interoperability between the Access T-1500 CSU/DSU, Tekelec Eagle STPs and Nortel Networks MSL-100, Siemens EWSD, and Lucent 5ESS SSPs was successfully tested. SS7 call setup, control, and signaling network management messages were successfully routed via A-links between Tekelec Eagle STPs and Nortel Networks MSL-100, Siemens EWSD, and Lucent 5ESS SSPs. The V.35 signaling data link accepted by the Tekelec Eagle STPs was also successfully tested.

12. SUMMARY. The Tekelec Eagle STP with Software Release 23.1 met the interoperability requirements for deployment in DISN and is certified for joint use in accordance with the requirements set forth in reference (d). A summary of test results for each STP is listed in tables 4 below.

Table 4. Eagle STP Conformance and Interoperability Status

Conformance Status			
Conformance Requirement	ER/Criteria	Critical	Status
SS7 Network Structure	SS7 structure (GSCR Para 6.5.1)	Yes	Met
	Gateway screening (GSCR Para 6.5.1.1)	Yes	Met
Signaling Link Characteristics	SS7 link performance with stored program control switches (GSCR Para 6.5.1, 6.5.2)	Yes	Met
Signaling Message Handling, Formats and Codes	Link Status Signaling Units (LSSU) codes and format (GSCR Para 6.5.3, 6.5.4, 6.5.10)	Yes	Met
	Emergency alignment (GSCR Para 6.5.2, 6.5.4)	Yes	Met
	Message formats (GSCR Para 6.5.10, 6.5.11)	Yes	Met
	Message handling (GSCR Para 6.5.3)	Yes	Met
	Signaling Connection Control Part (SCCP) capabilities (GSCR Para 6.5.5)	Yes	Met
Signaling Network Management	Load sharing (GSCR Para 6.5.3.1)	Yes	Met
	Signaling link management (GSCR Para 6.5.4)	Yes	Met
Error Detection and Recovery	Signaling route management (GSCR Para 6.5.4)	Yes	Met
	Basic error detection and recovery (GSCR Para 6.5.2.1)	Yes	Met
Signaling Link Congestion	Preventive Cyclic Redundancy (PCR) error detection and recovery (GSCR Para 6.5.2.1)	Yes	Met
	Signaling link congestion (GSCR Para 6.5.4.2)	No	Not tested

**Table 4. Tekelec Eagle STP Conformance and Interoperability Status
(continued)**

Interoperability Status			
Interface	ER/Criteria	Critical	Status
V.35 & OCU-DP	A-Link Signaling	Yes	Certified
	B-Link Signaling	Yes	
	C-Link Signaling	Yes	
DS0A	Same as V.35/OCU-DP	No	Not tested
DS1	Same as V.35/OCU-DP	No	Not tested

SUMMARY SHEET

SUSPENSE DATE:

TO	ACTION	TYPED NAME	INIT	DATE	TO	ACTION	TYPED NAME	INIT	DATE
1. JTEB	Review	LTC Romeo	<i>[Signature]</i>	20 FEB 02	JTE	ERD Release	O. Hartman		
2. Cert Panel Co-Chair	Review	Ms Tran	PT	3/12	8.				
3. JTE	Process	O. Hartman	OH	25/2	9.	12 March 02	25 Mar 02		
4. JTEA	Review Final Cert Ltr	LTC Romeo	<i>[Signature]</i>	13 MAR	10.				
5. JTE	Sign	Mr. Claudio	<i>[Signature]</i>	28 MAR 02	11.				
6. Deputy Cdr	Approve for Release	Mr. Beaugureau	<i>[Signature]</i>		12.				

ACTION OFFICER:

Capt. G.A. Bradley

OPR CODE:

JTEB

PHONE NUMBER:
3-8575

SIGNATURE

[Signature: G.A. Bradley]

DATE:

18 Feb 02

SUBJECT:

JPN 22 - Joint Interoperability Test Certification of Nortel Networks Broadband Signaling Transfer Point (BBSTP), Software Release 3.0.3.18d, and Tekelec Eagle Signaling Transfer Point (STP), Software Release 23.1
(STP info - System #984 Test #1779)

SUMMARY:

1. Please find enclosed the certification memo / test summary report for the STP certification effort. The documents have been staffed through the certification panel. Their comments and my response are enclosed.